Applicant Details

Attachment B1

B1 APPLICANT'S DETAILS

Name:

TechRec Ireland Limited

Site Address:

Unit 51 Park West Industrial Estate,
Nangor Road,
Dublin 12,
Ireland.
Office phone: +353 1 612 4340
Office Fax: +353 1 612 4341

National Grid Reference:

1395 E 2326N

Site Contact for Correspondence:

Mr Gerry Killen
Mobile: 087 222 3702
Email: bpalmer@techrec.com

Address as above.

Company Registration No:

No: 402298

Registered Company Address:

151 Thomas Street,
Dublin 8,
Ireland.
Office phone: +353 1 612 1200
Office Fax: +353 1 612 1210

Board of Directors:

Chairman:	Philip Lynch
Managing Director:	Gerard Killen
Secretary:	Susan Holburn
Board Member:	Brendan Palmer
Board Member:	Mick Long
Board Member:	Paul Dixon
Board Member:	Shane Lombard
Board Member:	Peter Brennan

Site Ownership:

The land is wholly owned by *Newtowns Investment Ltd*, which is a wholly owned subsidiary of the *One51 Group* of companies and is leased by *TechRec Ireland Limited*.

The area to be leased from *Newtowns Investment Ltd*. and the area where the activity is to take place are identical. The area which is leased and the area where the activity will take place are highlighted in *Drawing 01 and 06* – they are both represented by the area highlighted in red.

Number 402298

certified a true copy of the original.
SUSAN HOLBURN
CO. SECRETARY
07/09/05

Certificate of Incorporation

I hereby certify that

IMMARK IRELAND LIMITED

is this day incorporated under
the Companies Acts 1963 to 2003,
and that the company is limited.

Given under my hand at Dublin, this

Wednesday, the 18th day of May, 2005

for Registrar of Companies

Number 402298

certified a true copy of the original
SUE HOLBURN
SUSAN HOLBURN
CO. SECRETARY
07/09/05

Certificate of Incorporation on change of name

I hereby certify that

IMMARK IRELAND LIMITED

having, by a Special Resolution of the Company, and with the approval of the Minister for Enterprise, Trade and Employment, changed its name, is now incorporated as a limited company under the name

TECHREC IRELAND LIMITED

and I have entered such name on the Register accordingly.

Given under my hand at Dublin, this

Wednesday, the 13th day of July, 2005

for Registrar of Companies

Location of Activity

Attachment B2

Reference is to be made to Drawing 06, 07 and 08.

Drawing 06 – Highlights site boundary in a red line and the location where Grid Reference relates to.
Drawing 07 – Provides information of areas surrounding the site within 500m of the site boundary.
Drawing 08 - Provides details of all underground services within 250m of the site boundary.

Planning Authority

Attachment B3

TechRec Ireland Limited has notified the Dublin City Council Planning Department of their intention to apply for a Waste Licence. A copy of the letter is included as *Annex B6-2* to this Attachment.

In addition, at the time of the Application, the Operator was seeking Planning Permission from ***Dublin City Council*** for the following:

1) Retention of 'change of use' of an industrial warehouse unit from storage depot to light industrial use. The building is single storey consisting of warehouse space and associated offices at ground floor and mezzanine level;

2) Retention of associated signage;

3) Addition of a glazed entrance lobby, reception and waiting area to the front (North) façade at Unit 51 Park West Industrial Estate, Dublin 12, by TechRec Ireland Limited.

The original (and current), planning permission for the site is included in *Annex B3-1*.

At the time of the Application, the facility was operating under a valid Waste Permit (Ref: WP 98099) issued by Dublin City Council. A copy of the Permit is included in *Annex B3-2* to this Attachment.

Annex B3-1 Original Planning Permission

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
Planning Registry & Decisions, Planning Department
Civic Offices, Wood Quay, Dublin 8

Clárlann / Cinntí Pleanála
An Roinn Pleanála agus Forbartha, Clárlann / Cinntí
Oifigí na Cathrach, An Ché Adhmaid, Baile Átha Cliath 8
Registry T: (01) 222 2149 / F: (01) 222 2675
Decision T: (01) 222 2288 / F: (01) 222 3097

07/7/2006

Carew Kelly Architects,
18/19 Harcourt Street,
Dublin 2.

THIS IS AN IMPORTANT LEGAL DOCUMENT AND SHOULD BE PLACED WITH YOUR TITLE DEEDS

Application No.	2529/99
Registration Date	06-Aug-1999
Decision Date	26-Jan-2000
Decision Order No	0301
Date of Final Grant	08-Mar-2000
Grant Order No	1024
Location	Former Semperit Factory,, Killeen Road,, Dublin 10.
Proposal	Development of industrial/warehouse units plus offices at the former Semperit Factory, Killeen Road, Dublin 10, comprising the following:

Demolition of existing offices, plantrooms, outbuildings, site structures, store rooms, refurbishment and recladding of existing warehouse/production area; additional floor onto existing three storey building, new light industrial/ warehouse units consisting of the following:

10 no. small two storey incubator units, 8 no. linked warehouses with 2 storey attached offices and spine wall, 7 no. large attached warehouses with attached 3 storey offices, 4 detached warehouses with ancillary 2 storey offices, 5 no. additional two storey office areas attached to existing buildings. Six no. ancillary two storey office areas located within the existing building, one no. multi- storey carpark and 1 railway station building. To include for extensive landscaping carparking, site works, retaining structures and roads.

The application is accompanied by an Environmental Impact Statement in accordance with Article 24 of the Environmental Impact Assessment Regulations and can be inspected during office hours at the offices of the Planning Authority.

Applicant	Airscape Ltd., 18/19 Harcourt Street,, Dublin 2.
Application Type	Permission

NOTIFICATION OF GRANT OF PERMISSION

PERMISSION for the development described above has been granted under the Planning & Development Act 2000 subject to the following conditions.

Head Office, Civic Offices, Wood Quay, Dublin 8, Ireland
Ceannoifig, Oifigí na Cathrach, An Ché Adhmaid, B.Á.C. 8, Éire
t. 01 222 2222 www.dublincity.ie

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
Planning Registry & Decisions, Planning Department
Civic Offices, Wood Quay, Dublin 8

Clárlann / Cinntí Pleanála
An Roinn Pleanála agus Forbartha, Clárlann / Cinntí
Oifigí na Cathrach, An Ché Adhmaid, Baile Átha Cliath 8
Registry T: (01) 222 2149 / F: (01) 222 2675
Decision T: (01) 222 2288 / F: (01) 222 3097

07/7/2006

CONDITIONS AND REASONS FOR CONDITIONS

Insofar as the Local Government (Planning & Development) Acts 1963/93 and the Regulations made thereunder are concerned the development shall be carried out in accordance with the plans, particulars and specifications lodged with the application, and plans and amendments of 7/12/99 save as may be required by the conditions attached hereto. For the avoidance of doubt, this permission shall not be construed as approving any development shown on the plans, particulars and specifications, the nature and extent of which has not been adequately stated in the statutory public notices.
REASON: To comply with permission regulations.

The proposed multi storey car park shall be omitted as proposed by applicant on 7/12/99.
Reason: In the interests of the proper planning and development of the area.

The proposed use of Type A building shall be restricted to science and technology, software production and ancillary offices for existing enterprises on site as proposed by the applicant.
Reason: In the interests of the proper planning and development of the area and to comply with the zoning objective for the area.

The existing vehicular entrance to Killeen Road shall be closed. Pedestrian access here shall be provided to the railway station.
Reason: In the interests of the proper planning and development of the area.

Public access to the railway station shall be provided through the site and from the housing area to the north of the site and full details shall be submitted to and agreed in writing by the Planning Authority before development commences.
Reason: In the interests of the proper planning and development of the area.

A high quality of landscaping, tree planting and boundary treatment shall be provided along the Killeen Road boundary before the first unit is occupied. A detailed landscaping plan for this area and the entire site shall be submitted to and agreed in writing by the Planning Authority before development commences.
Reason: In the interests of the proper planning and development of the area.

Details of the proposed railway station, public access to same, provision for additional railway line and details of agreement with CIE shall be submitted to and agreed in writing by the Planning Authority before development commences.
Reason: In the interests of the proper planning and development of the area.

(a) A detailed drawing shall be submitted to and agreed in writing by Planning Authority before development commences showing how it is proposed to physically prevent traffic from turning left from the site to the Killeen Road.

(b) The proposed main access road shall not be connected to Killeen Road until the proposed realignment of the Killeen Road is completed. If the commencement of the development predates the realignment of Killeen Road all construction traffic must access and egress the site via Park West. Reason: In the interests of the proper planning and development of the area.

Revised drainage proposals shall be submitted to and agreed in writing by the Planning Authority before development commences providing for the following requirements. Proposed development affected by these requirements shall be omitted or modified as necessary.

(a) The proposed diversion of the river culvert is not acceptable. It is not permitted to build over the culvert and Drainage Division will not allow any interference with the culvert.

Head Office, Civic Offices, Wood Quay, Dublin 8, Ireland
Ceannoifig, Oifigí na Cathrach, An Ché Adhmaid, B.Á.C. 8, Éire
T. 01 222 2222 www.dublincity.ie

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
Planning Registry & Decisions, Planning Department
Civic Offices, Wood Quay, Dublin 8

Clárlann / Cinntí Pleanála
An Roinn Pleanála agus Forbartha, Clárlann / Cinntí
Oifigí na Cathrach, An Ché Adhmaid, Baile Átha Cliath 8
Registry T: (01) 222 2149 / F: (01) 222 2675
Decision T: (01) 222 2288 / F: (01) 222 3097

07/7/2006

(b) The developers proposal in regard to surface water discharge is not in accordance with the policy adopted in the City Development Plan.

(c) The proposal to pump the foul drainage to Killeen Road is not acceptable, a gravity connection for foul drainage should be achievable for this site.

(d) An interceptor shall be installed in the drainage system prior to its entry into the surface water sewer. The interceptor shall be sized such that it meets the requirements of a class 1 interceptor as specified by the Draft European Standard prEN858-1, and that there shall be a full 6 minutes retention for a rainfall rate of 50mm/hr with a bypass facility for the remainder of the storm. All roof and non-comtaminated surface drainage shall be connected down stream of the interceptor.
Reason: In the interests of the proper planning and development of the area.

A Sustainable Mobility Management Plan shall be submitted to and agreed in writing by the Planning Authority before development commences. This plan shall promote the use of public transport, walking and cycling amongst staff and visitors. This plan shall provide information on anticipated modal split during the different phases of the development and initiatives to reduce dependence on the car (eg. dedicated parking spaces for car sharers/secure bicycle parking and showers/lockers for cyclists etc.) and the anticipated shift to public transport at different stages of the Development in line with the anticipated dates for the provision of Public Transport and Cycling infrastructure.

Further details of the private bus linking the proposed development with the future proposed public transport infrastructure to be provided ie. hours of operation, capacity etc. and also commitment to provision of this facility in line with required capacity at no cost to the public transport provider.

Cycle parking should be included in accordance with Cycle Parking Standards (Table 14.2) of Dublin City Development Plan 1999. Details of secure cycle parking provision and associated facilities are required.

To encourage travel to work by bicycle it will be necessary to indicate anticipated cycle route links from the site to the existing and proposed cycle network.

Links to and form the site to railway station and to adjacent residential areas including across canal need to be indicated and upgrading safe network of pedestrian links to be shown to facilitate walking to and from work. This should include links along new road construcction/ improvements. A Safety Audit shall also be submitted.

The requirements of the Waterworks Section shall be ascertained and complied with.
Reason: In the interests of the proper planning and development of the area.

Before this development commences a financial contribution in the sum of €673,033.00 shall be paid by the applicant to Dublin Corporation, in accordance with Section 26 of the Local Government (Planning & Development) Act 1963.
REASON : Investment by Dublin Corporation in Local Authority works has facilitated and will facilitate the proposed development. It is considered appropriate and reasonable that the developer should contribute to the cost of same.

Signed on behalf of the Dublin City Council _____
for Assistant City Manager

Date _____

YOUR ATTENTION IS DRAWN TO THE REQUIREMENTS OF THE ATTACHED 'CODES OF PRACTICE'

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
Planning Registry & Decisions, Planning Department
Civic Offices, Wood Quay, Dublin 8

Clárlann / Cinntí Pleanála
An Roinn Pleanála agus Forbartha, Clárlann / Cinntí
Oifigí na Cathrach, An Ché Adhmaid, Baile Átha Cliath 8
Registry T: (01) 222 2149 / F: (01) 222 2675
Decision T: (01) 222 2288 / F: (01) 222 3097

07/7/2006

N.B. IT SHOULD BE CLEARLY UNDERSTOOD THAT THE GRANTING OF PLANNING PERMISSION DOES NOT RELIEVE THE DEVELOPER OF THE RESPONSIBILITY OF COMPLYING WITH ANY REQUIREMENTS UNDER OTHER CODES OF LEGISLATION AFFECTING THE PROPOSAL AND THAT A PERSON SHALL NOT BE ENTITLED BY REASON OF A PLANNING PERMISSION TO CARRY OUT ANY DEVELOPMENT.

NOT2perm

Annex B3-2 Waste Permit

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

Schedule of Conditions referred to in Manager's Order ENG 124/ 2006

Waste Management (Permit) Regulations, 1998 S.I. No. 165 of 1998.

WASTE PERMIT

Facility being permitted: **TechRec Ireland Ltd.,**
Unit 51 Park West Business Park,
Nangor Road,
Dublin 12. (as per condition 1.4).

Permit Register Number: **WP 98039**

Dublin City Council in accordance with Article 5 of the above Regulations has granted a **Waste Permit** under **Managers Order ENG/ 124/ 2006** to:

TechRec Ireland Ltd.,

(hereinafter called the permit holder) for a period of 3 years, beginning on **13th February 2006** and ending on **13h February 2009** subject to this schedule of **10 sets of conditions** to carry on the following waste recovery activities;

pre-processing and storage facility for Waste Electrical and Electronic Equipment (WEEE). Recycling and reclaiming of metals and plastics.

In accordance with Class 3 and Class 13 of the Fourth Schedule of the Waste Management Acts, 1996 to 2003.

Head of Waste Management Services

Dated this 13th **day of** February **2006**

INTERPRETATION

Act	The Waste Management Acts 1996 to 2003.
Authorised Person	As defined in Section 5(1) of the Act.
Consignment Note	All movements of hazardous waste within Ireland must be accompanied by a **"C1"** consignment note issued by a local authority under the Waste Management (Movement of Hazardous Waste) Regulations (SI No. 147 of 1998). Transfrontier shipment notification and movement/tracking form numbers are required for all exports of waste from, into or through the state under the Waste Management (Transfrontier Shipment of Waste) Regulations (SI No. 149 of 1998).
Disposal	As defined in Section 4 (3) of the Act, including any of the activities specified in the Third Schedule of the Act.
Emission	As defined in Section 5 (1) of the Act.
Environmental Pollution	As defined in Section 5 (1) of the Act.
European Waste Catalogue (EWC)	As defined in Section 5(1) of the Act.
Facility	That area or areas defined in condition 1.4 of this Permit.
Further Information	Information and particulars received pursuant to a notice under article 12 (1) of the Waste Management (Permit) Regulations, 1998 (S.I. No. 165 of 1998) in relation to Waste Permit application WP98099.
Hazardous substance	As defined in Section 4(2)(a) of the Act.
Maintain	Keep in a fit state, including such regular inspection, servicing and repair as may be necessary to perform its function.
Permit	A Waste Permit issued in accordance with the Waste Management (Permit) Regulations, 1998 (S.I. No. 165 of 1998).
Permit Holder	**TechRec Ireland Ltd**, Unit 51 Park West Business Park, Nangor Road, Dublin 12.
Recovery	As defined in section 4 (4) of the Act including any of the activities specified in the Fourth Schedule of the Act.
Treatment	As defined in Section 5 (1) of the Act.
Waste	As defined in Section 4 (1) of the Act.

1. SCOPE

1.1. The permit holder may operate a facility at the premises described on the first page of this permit, for the pre-processing and storage of a Waste Electrical and Electronic Equipment (WEEE) for the purpose of recycling and reclaiming of metals and plastics and the recovery of packaging waste; also the recovery of fluorescent tubes and sodium lamps, which may contain mercury or its compounds, *and no other waste whatsoever.*

1.2. The activities shall be controlled, operated and maintained as set out in this permit.

1.3. The permit holder shall give notice in writing to Dublin City Council of any changes in the information furnished to that authority under article 10(1) or article 12(1) of the Waste Management (Permit) Regulations, 1998, within three weeks of any such change arising. On receipt of this information, Dublin City Council may require a new waste permit application to be submitted.

1.4. For the purposes of this waste permit the facility is the area outlined on the site plan (Drawing no: 9901-200F highlighted in yellow) of the waste permit application Registration number WP 98099. Any reference in this permit to the "facility" shall mean the area thus outlined.

1.5. The conditions of this permit may be reviewed or altered at any time during its life by Dublin City Council.

1.6. This waste permit and any condition imposed therein shall not relieve the permit holder of his/ her statutory obligations under legislation, regulations, bye- laws, or any other enactments whatsoever.

1.7. This permit is non-transferable to any other person, concern, or premises.

1.8. The permit holder shall only accept waste from holders of a waste collection permit, unless an exemption applies in accordance with the Waste Management (Waste Collection Permit) Regulations,2001.

2. MANAGEMENT OF THE ACTIVITY

2.1 The permit holder shall identify all hazards associated with the wastes being recovered, and will make himself/ herself aware of good practices regarding its safe movement, handling and storage, and shall adopt all necessary, reasonable and practicable safety measures accordingly, to the satisfaction of the pertaining regulatory body or bodies.

Head of Waste Management Services — Dated 13/2/06

2.2 The permit holder shall acquaint all staff, employees, servants, lessees and agents of the provisions and conditions of this permit, in particular in the cases of changes of personnel.

2.3 The permit holder is to hold or cause to be held a copy of the permit at all times at the facility, which is used, for the purposes of the activities to which the permit relates.

2.4 Waste shall only be accepted at the facility only between the hours of 7am to 7pm Monday to Friday. Essential maintenance of equipment, which does not involve the handling of waste, may be carried on outside of these hours.

3. NOTIFICATION AND RECORD KEEPING

INCIDENTS WITH THE POTENTIAL FOR ENVIRONMENTAL POLLUTION

3.1 The permit holder shall **NOTIFY DUBLIN CITY COUNCIL** by both telephone and facsimile, if available, **AS SOON AS PRACTICABLE** after the occurrence of any incident with the potential for environmental contamination of surface water or ground water, or posing an environmental threat to air or land, or requiring an emergency response by Dublin City Council.

The permit holder shall include as part of the notification:

(a) date and time of the incident

(b) details of the occurrence

(c) steps taken to avoid reoccurrence

The Senior Engineer or the Head of Waste Management Services, Waste Management Services, Dublin City Council; Telephone Number 01 2224300, Facsimile Number: 01 4544830 shall also be notified in accordance with this Condition.

3.2 A **WRITTEN RECORD** of any incident outlined in Condition 3.1 shall be sent to The Head of Waste Management Services, Dublin City Council 68-71 Marrowbone Lane, Dublin 8 **WITHIN 1 MONTH** of the incident occurring.

This shall include the following information:

(a) The Waste Permit Register Number of the Facility where the incident occurred

(b) Address of the facility

(c) Details of the circumstances giving rise to the incident

(d) All actions taken to minimise the effect of the incident on the environment

(e) All actions taken minimise the wastes generated.

(f) All actions taken to minimise the recurrence of the incident

3.3 Annual Statistical Returns:

3.3.1 The permit holder shall submit returns to Dublin City Council for its agreement, not later than the 28th February of each calendar year, statistical returns of the

preceding calendar year or part thereof containing a summary of records specified in condition 3.5.

3.3.2 The permit holder shall maintain waste management records in accordance with condition 3.5 for a period of three years.

3.4 The permit holder is required to notify Dublin City Council within 7 days of the imposition of any requirement on that person by order under Section 57 or 58 of the Waste Management Act, 1996 or any conviction of that person for an offence prescribed for the purposes of Section 34(5) or Section 40(7) of the Waste Management Act, 1996 as amended.

3.5 The permit holder shall maintain full records at the facility, open to inspection by authorised Dublin City Council persons at all times, of matters relating to the waste management operations and practices at this facility. The records shall contain the following information:

a) The nature and quantities (in tonnes) of all wastes handled (recovered or disposed of) and its origin, treatment and destination.

b) The on site locations of where waste is deposited and the quantities (in tonnes) and nature of the waste in each case

c) The names and collection permit number of the agents and transporters of waste leaving the facility.

d) Details of any waste contamination arising in the permitted waste (non- permitted waste) and its eventual recovery/ disposal route.

The above records shall be submitted in summary form as part of the Annual returns for the facility as per condition 3.3.

3.6 The permit holder shall not compile information which is false or misleading and will maintain all records for a period of three years.

4. SITE INFRASTRUCTURE

4.1 Within **1 month** of the date of grant of this permit, an identification board shall be provided and maintained on the facility so that it can be legible to persons outside the main entrance to the facility.

4.2 The board shall clearly indicate:

4.2.1 The name and telephone number of the facility.

4.2.2 That the facility has been granted a waste permit from Dublin City Council.

4.2.3 The waste permit number, date of grant and duration of permission.

4.2.4 The normal opening hours of the facility.

4.3 The site shall be adequately secured to prevent unauthorised access at all times.

Head of Waste Management Services

4.4 The doors of and gates of the facility shall be kept locked shut when the facility is unsupervised.

4.5 The permit holder shall maintain an impermeable concrete surface throughout the facility. All waste handling and storage areas at the facility shall be concreted and constructed to British Standard BS 8110.

4.6 All areas of impermeable pavement shall be provided with suitable cleanser- degreaser equipment.

4.7 A waste inspection area or areas and a waste quarantine area shall be provided and maintained at the facility.

4.8 A waste inspection area and a waste quarantine area shall be constructed and maintained in a manner suitable, and be of a size appropriate, for the inspection of waste and subsequent quarantine if required. The waste inspection area and the waste quarantine area shall be clearly identified and segregated from each other.

4.9 All oil/diesel storage tanker containers shall be stored within a bunded storage area that would suffice to contain any product spilled in the event of a pollution incident.

5. WASTE ACCEPTANCE AND HANDLING

5.1 The following wastes only, shall be accepted at the facility;

a)	**101111*** Waste glass in small particles and glass powder containing heavy metals (for example from cathode ray tubes)
b)	**150101** Paper and cardboard packaging
c)	**150102** Plastic packaging
d)	**150103** Wooden packaging
e)	**150104** Metallic packaging
f)	**150105** Composite packaging
g)	**150106** Mixed packaging
h)	**160601*** lead batteries
i)	**160602*** Ni – Cd batteries
j)	**160604** Alkaline batteries (except 160603)
k)	**160211*** Discarded equipment containing chlorofluorocarbons, HCFC, HFC
l)	**160213*** Discarded equipment containing hazardous components ([2]) other than those mentioned in 160209 to 160212
m)	**160214** Discarded equipment other than those mentioned in 160209 to 160213

n) **160216** Components removed from discarded equipment other than those mentioned in160215

o) **170411** Cables other than those mentioned in 170410

p) **200121*** Fluorescent tubes and other mercury containing waste

q) **200123*** Discarded equipment containing chlorofluorocarbons

r) **200133*** Batteries and accumulators included in 160601,160602,or 160603 and unsorted batteries and accumulators containing these batteries

s) **200135*** Discarded electrical and electronic equipment other than those mentioned in 200121 and 200123 containing hazardous components

t) **200136** Discarded electrical and electronic equipment other than those mentioned in 200121,200123 and 200135.

5.2 Waste shall be accepted at the facility only from waste collection permit holders or authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations, 2001 S.I. No. 402 of 2001 and Section 34 of the Act.

5.3 Waste arriving at the facility shall be quantified and documented.

5.4 The waste shall be inspected prior to being processed, and any materials which are not listed in Condition 5.1 shall be immediately separated. Temporary storage of such wastes shall be in a designated quarantine area. Waste shall be stored under appropriate conditions in the quarantine area to avoid odour generation, the attraction of vermin and any other nuisance. This waste shall be transferred to a facility for the purpose of a recovery or disposal activity in respect of which Section 39(1) of the Waste Management Act, 1996, as amended, applies and where there is in force a waste licence or a waste permit in relation to the carrying on of the activity concerned at the facility.

5.5 Batteries removed from WEEE goods shall be stored intact and upright in an acid resistant, bunded, covered compound or purpose built acid resistant container, prior to removal off site for delivery to an appropriately licensed waste facility.

5.6 Non- permitted wastes and waste stored in the quarantine area, except for waste paper and wood, shall be removed from the facility within 7 days of its arrival at the facility.

5.7 The permitted waste shall be handled at all times within the site area as outlined in Condition 1.4.

5.8 The permitted waste shall be stored and handled in a manner, which does not cause environmental pollution or harm to human health.

5.9 Appropriate personal protective equipment shall be provided to employees.

Head of Waste Management Services — Dated 13/2/06

5.10 The facility shall be kept in a clean and tidy condition.

5.11 Waste shall not be deposited on the public road or pavement outside the facility.

5.12 The permit holder shall ensure that all operations on site are carried out in accordance with then relevant provisions of the WEEE (Waste Electrical and Electronic Equipment) Regulations 2005 in respect of the storage of Waste Electrical and Electronic Equipment.

6. WASTE DISPOSAL/ RECOVERY OFF-SITE

6.1 The permit holder shall ensure that all waste which is transferred from the facility is transferred to a waste disposal or recovery activity in respect of which Section 39(1) or 39(4) of the Waste Management Acts, 1996 to 2003, applies and that there is in force a waste licence or a waste permit in relation to the carrying on of the activity concerned.

6.2 The permit holder shall not export waste from the state unless such export is fully in compliance with the requirements of Council Regulation (EEC) No. 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community.

6.3 All wastes sent off-site for recovery / disposal shall be inspected by the permit holder prior to leaving the facility to confirm their description and composition.

6.4 Waste sent off-site for recovery / disposal shall be conveyed in a manner which will not adversely affect the environment.

6.5 Waste transported from the permitted facility shall be transported by an authorised collector in accordance with the Waste Management (Collection Permit) Regulations, 2001 S.I. No. 402 of 2001.

7. EMISSIONS

7.1 Noise and Atmospheric Emissions

7.1.1 The rated noise levels from the site (defined as LAeq 1hour) shall not exceed the background noise level (as defined in **B.S. 4142. Method for rating industrial noise affecting mixed residential and in industrial areas)** by 10 dB or more.

7.1.2 The permit holder shall ensure that all operations on site shall be carried out in a manner such that air emissions and/ or odours do not result in significant impairment of or significant interference with amenities or the environment beyond the site boundary.

7.2 Air Pollution Control

7.1.1 All direct and indirect emissions to the atmosphere, including odours, shall be controlled to ensure that they do not:

- Result in injury to health
- Have a deleterious effect on flora or fauna or cause damage to property
- Impair or interfere with amenities or with the environment

8. FIRE PREVENTION

8.1 The Permit Holder shall obtain a Fire Safety Certificate prior to the commencement of permitted activities.

9. EMERGENCY RESPONSE

9.1.1 The permit holder shall ensure that an Emergency Response Procedure (ERP) is in place, which shall address any emergency situation, which may originate on- site. This procedure shall include provision for minimising the effects of any emergency on the environment. A copy of this document shall be available for inspection by staff of Dublin City Council on site at all times.

10. CHARGES AND FINANCIAL PROVISIONS

10.1 The permit holder shall pay €2,400 to Dublin City Council for the performance of its functions under the Waste Management Act, 1996 in relation to this permit. An invoice for this amount shall be issued to the permit holder by the Waste Management Services Division at the commencement of this period of permission. Any additional costs incurred by Dublin City Council in performing any functions in relation to the activity concerned shall be charged to the permit holder on an individual basis.

10.2 The permit holder shall effect and maintain a policy of insurance insuring him or her as respects any liability on his or her part to pay any damages or costs on account of injury to persons or property arising from the activities concerned. All insurance policies shall be extended to indemnify Dublin City Council. The permit will be automatically revoked if any part of the insurance is either removed or not renewed

Head of Waste Management Services — Dated 13/2/06

Sanitary Authority

Attachment B4

B4 SANITARY AUTHORITY

The regulatory authority responsible for the collection and treatment of sanitary effluent in the local area is Dublin City Council.

The process is a dry process and there are no process wastewater or trade waste emissions from the Site.

The only discharge to the sewer will arise from the onsite staff amenity facilities.

The foul drainage for the Park West Industrial Estate is collected in a private drainage network (maintained by the Park West Management Company) and eventually discharges to the Dublin City Council municipal network on Killeen Rd. From here it is pumped to the municipal wastewater treatment plant (WWTP) at located Ringsend, where it receives primary, secondary and tertiary treatment. The final discharge point from the WWTP is into Dublin Bay.

For additional details on the drainage network, refer to *Attachment D1* and *Drawing 09*.

Other Authorities

Attachment B5

B5 Other Authorities

All necessary information is included in the Licence Application Form in Section B5.

Notices & Advertisements

Attachment B6

The information required in Section B6 of the Licence Application is provided below.

a) *"Copy of the text of the site notice and an appropriately scaled drawing showing its location on site."*

The text as it appears on the Site notice, is copied below. *Drawing 06* identifies the site location and the location of the site notice.

"APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTE LICENCE

In accordance with Article 6 of the Waste Management Acts (1996 to 2003), TechRec Ireland Ltd, registered at 151 Thomas Street, Dublin 8, gives notice of its intent to make an application to the Environmental Protection Agency for a Waste Licence to operate a waste recovery facility for the recycling of Waste Electrical and Electronic Equipment (WEEE), to be located at Unit 51 Park West Industrial Park, Nangor Road, Dublin 12, (National Grid Reference 2326N, 3094E).

The business is currently operating at the subject site under a valid Waste Permit, for similar WEEE recovery activities. The plant will accept all categories of WEEE as specified in the First Schedule of the Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005, (S.I. No. 340 of 2005). The WEEE will be dismantled using a combination of mechanical and manual processes, and will be sorted into a variety of metal and plastic fractions. Around 96% of the separated fractions will be sent offsite for reuse, mostly as raw materials. The residual components, including some hazardous materials (e.g. oils and batteries) will be transferred to appropriately licensed facilities for treatment/disposal. The process is entirely dry and there are no wastewater streams generated. Similarly, there are no chemical treatment steps.

The principal activity as per the Fourth Schedule of the Waste Management Act is Class 3 -"Recycling or reclamation of metals and metal compounds" with a secondary activity of Class 13: "Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced". The site aims to process up to 30,000 tonnes of WEEE per year and store a further 8,000 tonnes per year (for subsequent offsite processing).

An Environmental Impact Assessment is not required under Article 93 of the Planning and Development Regulations 2001. A copy of the application for the waste licence and such further information relating to the application as may be furnished to the Agency in the course of their consideration of the application will, as soon as is practicable after receipt by the Agency, be available for inspection and purchase, at the headquarters of the Agency."

b) *"In the case of the original application the whole newspaper containing the advertisement."*

The Newspaper is included as *Annex B6-1* of this Attachment.

c) "*In the case of the copies of the application, the whole page of the newspaper containing the advertisement."*

The whole page of the newspaper containing the advertisement is contained in the copies of this application.

d) *"Where relevant, a copy of the correspondence notifying the Planning Authority of this application being made."*

In addition, *TechRec Ireland Limited* has notified the Dublin City Council Planning Department of their intention to apply for a Waste Licence. A copy of the letter is included as *Annex B6-2* to this Attachment.

Annex B6-1 Newspaper Advertisements

LAST FRIDAY Rattlebag, RTÉ R1, 2.45pm
This month's guest curator is Abbey Theatre director Fiach Mac Conghaill, whose chosen topic is Dublin.

CLASSICAL Lyric Concert, RTÉ Lyric FM, 8.30pm
The RTÉ CO, under the baton of Christopher Austin, performs Copland's *Appalachian Spring* and *Clarinet Concerto*, and Bernstein's *Candide Overture* and *Concert Suite No 1* from *West Side Story*.

THE FRIDAY PLAY The Price of Light, BBC R4, 9pm
Hilary Mantel's drama is based on the story of blind

radio
CHOICE

18th-century composer Maria Theresa von Paradis and her attempts to regain her vision.

SONNY SIMMONS Jazz on 3, BBC R3, 11.30pm
Jez Nelson interviews alto saxophonist Sonny Simmons and presents the second half of his band Cosmosamatics' performance, recorded at the 2005 London Jazz Festival.
Martin Noonan

Radio Listings

Sonny Simmons and his band Cosmosamatics, BBC R3, 11.30pm

RTÉ RADIO 1
FM: 88.2-90.0; 95.2 mHz, MW: 567, 729 kHz, LW: 252 kHz.
News on the hour. **5.30am** Risin' Time. **7.00** Morning Ireland. **9.00** The Tubridy Show. **11.00** Shanks' Mare. **11.30** The Ronan Collins Show. **1.00** News at One. **1.45** Liveline. **2.45** Rattlebag. See Choice **3.30** The Creedon Show. **5.00** Five Seven Live. **7.00** The Championship. **7.30** Farm Week. **7.30** Friday Sportsnight. (MW and LW) Soccer: Eircom League action. Presented by Con Murphy. **8.00** Guth na mBan. **8.30** The Best of Rattlebag. **9.50** Nuacht. **10.00** Sport; Venus in Blue. **11.00** Sports News. **11.10** The Book on One. *This Man and Me* by Alison Jameson. Read by Aideen Wylde. **11.25** Late Date. **2.00** Through the Night: The Tubridy Show. **3.00** Shanks' Mare. **3.30** Liveline. **4.00** The Mystery Train. **5.00** Cherish the Ladies. 1: Liz Carroll. **5.30** Seascapes.

RTÉ 2FM
FM: 90.4-92.2; 97.0 mHz.
6.00am The Early Show. **7.00** Marty in the Morning. **9.00** Gerry Ryan. **12.00** Damian Farrelly. **2.00** Ireland's Official Top 40 with Larry Gogan. **4.00** Ruth Scott. **6.00** Dave Fanning. **7.30** Newsbeat. **8.00** Jenny Huston's Waiting Room. Live music from the 2006 Montreux Festival. **10.00** Damien McCaul. **12.00** Conor G. **2.00** Late Night Sessions. **5.00** 2fm Overnight.

RTÉ LYRIC FM
FM: 96-99 mHz.
7.00am Lyric Breakfast. **10.00** Lyric Notes. **12.30** Lyric Lunchtime Choice. **3.00** The Music Box. Trish Taylor with music from West Cork Chamber Music Festival. Schnittke: *Moz-Art for two violins*. Mozart: *Flute Sonata, K378*; *String Quartet, K593*. **5.00** Drivetime Classics. **7.30** Grace Notes. **8.30** The Lyric Concert. See Choice **10.30** The Third Wave. Eamonn Lenihan with jazz,

Journey. 5: Four Months in 1945. Cooke returns to New York. **10.00** Woman's Hour. With Martha Kearney. Drama: *The Paston Letters* (10/10). **11.00** Camel Train. Matthew Parris reports from the Danakil Depression in Ethiopia. **11.30** My Turn to Make the Tea. Sheila Goff's four-part adaptation of Monica Dickens's semi-autobiographical novel, set in the 1950s. 1: The Stain on the Carpet. **12.00** You and Yours. **12.57** Weather. **1.00** The World at One. **1.30** Feedback. **2.00** The Archers. **2.15** Afternoon Play: *The Conversation*. Dramatic reconstruction of a conversation between two men whose fathers were Jewish slave labourers in Poland and then Germany. **3.00** Shared Earth. **3.30** Psychobabble. 5: *Baggage*, by Elizabeth Reeder. A woman tackles the clutter at the bottom of her summer bag. **3.45** Georgian Giants. A look at an extraordinary cricket match that took place 200 years ago. **4.00** Last Word. **4.30** The Film Programme. **5.00** PM. **6.00** News. **6.30** Armando Iannucci's Charm Offensive. **7.00** The Archers. **7.15** Front Row. **7.45** The Paston Letters. 10: An Enduring Family. Margaret loses two relatives in the space of three months. **8.00** Any Questions? **8.50** A Point of View. **9.00** The Friday Play: *The Price of Light*. See Choice **9.59** Weather. **10.00** The World Tonight. **10.45** Book at Bedtime: *The Other Side of You*. 5: David realises he is in love. **11.00** A Good Read. **11.30** Today in Parliament. **12.00** News. **12.30** Book of the Week: *Alistair Cooke's American Journey*. 5: Four Months in 1945. **12.48** Shipping. **1.00** World Service.

BBC RADIO 5
MW: 693, 909 kHz.
6.00am Breakfast at the World Cup. **9.00** Phil Williams at the World Cup. **12.00** News. **12.30** Wimbledon. **4.00** Five Live Sport at the World Cup.

Annex B6-2 Notification to Planning Authority

4 July 2006

Head of Planning
Dublin City Council,
Wood Quay,
Dublin 1.

Our ref: 0036643/ notification of intention to make an application to the Environmental Protection Agency for a waste licence

Dear Sir/Madam,

In accordance with Article 6 of the Waste Management Acts (1996 to 2003), TechRec Ireland Ltd, registered at 151 Thomas Street, Dublin 8, gives notice of its intent to make an application to the Environmental Protection Agency for a Waste Licence to operate a waste recovery facility for the recycling of Waste Electrical and Electronic Equipment (WEEE), to be located at Unit 51 Park West Industrial Park, Nangor Road, Dublin 12, (National Grid Reference 2326N, 3094E).

The business is currently operating at the subject site under a valid Waste Permit, for similar WEEE recovery activities. The plant will accept all categories of WEEE as specified in the *First Schedule* of the *Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005, (S.I. No. 340 of 2005)*. The WEEE will be dismantled using a combination of mechanical and manual processes, and will be sorted into a variety of metal and plastic fractions. Around 96% of the separated fractions will be sent offsite for reuse, mostly as raw materials. The residual components, including some hazardous materials (e.g. oils and batteries) will be transferred to appropriately licensed facilities for treatment/disposal. The process is entirely dry and there are no wastewater streams generated. Similarly, there are no chemical treatment steps.

The principal activity as per the *Fourth Schedule* of the *Waste Management Act* is Class 3 -"*Recycling or reclamation of metals and metal compounds*" with a secondary activity of Class 13: "*Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced*". The site aims to process up to 30,000 tonnes of WEEE per year and store a further 8,000 tonnes per year (for subsequent offsite processing).

TechRec Ireland Ltd
51 Park West Industrial Estate
Nangor Road
Dublin 12
Ireland

Ph: +353 1 620 4300
Fx: +353 1 620 4341

www.techrec.ie

An Environmental Impact Assessment as per Article 13 of the Waste Management (Licensing) Regulations 2004, is not required as part of the licence application process. An Environmental Report has, however, been prepared which satisfies the requirements of Section I of the EPA waste licence application form. This will be included as part of the waste licence application. A copy of the application for the waste licence and such further information relating to the application as may be furnished to the Agency in the course of their consideration of the application will, as soon as is practicable after receipt by the Agency, be available for inspection and purchase, at the headquarters of the Agency.

Sincerely,

Gerry Killen
Managing Director

TechRec Ireland Ltd
51 Park West Industrial Estate
Nangor Road
Dublin 12
Ireland

Ph: +353 1 620 4300
Fx: +353 1 620 4341

www.techrec.ie

Principal Waste Activity

Attachment B7

B7 TYPE OF WASTE ACTIVITY

B7.1 PRINCIPAL ACTIVITY

The principal activity undertaken on the Site as defined under the *Waste Management Acts 1996 – 2003, Fourth Schedule – Waste Recovery Activities*, is:

- No.3 - recycling or reclamation of metals and metal compounds.

The process is currently operating under a valid Waste Permit (*WP 98099*) issued by the Dublin City Council for the 'Pre-processing and storage of Waste Electrical and Electronic Equipment (WEEE), including the recycling and reclamation of metals and plastics'. The Permit is valid for the receipt and processing of up to 5,000 tonnes of WEEE per year. A copy of the Permit is included in *Annex B3-2*. A Waste Licence is being sought in order to allow the facility to increase its processing capacity above the current 5,000 tonne limit.

The Site currently accepts all categories of Waste Electrical and Electronic Equipment (WEEE) as specified in the First Schedule of the *Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005*, S.I. No. 340 of 2005.

The activity involves a four staged separation process as follows:

- Module 1 – Goods receipt, sorting, dismantling and CRT processing;
- Module 2 – Preliminary breakdown and separation;
- Module 3 – Secondary breakdown and mechanical separation; and
- Module 4 – Fine separation.

The WEEE is initially separated at the point of acceptance onto the Site, into a number of distinct categories as follows:

- Small WEEE that can go straight into the process at Module 2;
- Large WEEE which requires some degree of manual dismantling in Module 1, prior to proceeding to Module 2;
- WEEE containing Cathode Ray Tubes (CRT) which is placed in the "CRT Storage Area" prior to being processed through a specialist separation unit (part of Module 1);
- WEEE containing oil or other fluid which will be drained at the "Oil Separation Station" prior to processing (through either Module 1 or 2 depending on size);
- ODS containing equipment (e.g. fridges and freezers), which will be stored in the "Fridge and Freezer Area" prior to being transferred offsite with an appropriately licensed contractor for recycling; and
- Florescent light tubes which will be stored in purpose designed lamp coffins in the "Hazardous Waste Storage" area, prior to being sent to an appropriately licensed treatment facility, or potentially recovered onsite through a specialist (mobile) treatment process;

- Items containing hazardous components such as PCB oils/resins or asbestos, which will be stored in the "Hazardous Waste Storage" area, prior to being sent to an appropriately licensed treatment/disposal facility.

The process involves the manual sorting and dismantling of incoming WEEE and its subsequent mechanical and manual separation into its component fractions. The activity uses a number of proprietary machines including the *QZ Machine* (a rotating chain threshing unit). The final process uses a combination density and magnetic separation. The process is entirely dry and does not involve the generation of any liquid effluent, or the use of any treatment chemicals. There are two point source air emissions, which vent from the dust abatement systems. There are also a number of equipment items which vent treated air emissions back inside the building.

The process generates a number of distinct final fractions which are intended for off-site reuse (e.g. as raw materials in a smelter), or for further processing (e.g. waste oils). These include:

- Iron,
- Aluminium;
- Mixed precious metals;
- Plastics;
- Hazardous components (e.g. mercury switches);
- Individual component items [1], (e.g. motors, cables, mobile phone chargers, washing machines blocks etc); and
- Oils.

The complete list of all fractions and their intended destination(s) is included in *Attachment H.4.*

Associated Activities

The secondary activity on the Site, as listed under the *Waste Management Acts 1996 – 2003, Fourth Schedule – Waste Recovery Activities* is:

- No.13 Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

WEEE that cannot be processed on Site (e.g. items containing PCBs, ODS or asbestos), will be accepted and temporarily stored in a designated Quarantine Area, prior to being transferred to an appropriately licensed contractor for offsite for treatment and/or disposal.

WEEE that will require temporary onsite (quarantined) storage prior to shipment may include:

- Fridges, freezers and other items potentially containing ODS;

(1) As these items have a greater potential value for reuse or recycling if left intact.

- Transformers, capacitors, switch gear and other items potentially containing PCBs;
- Items potentially containing asbestos;
- Items containing radioactive materials (e.g. smoke detectors, some level gauges);
- Fluorescent light bulbs; or
- Other WEEE that does not meet the waste acceptance criteria which are being developed for the Site.

Additional details on the Quarantine Area are provided in *Attachment D1 – Section D1-h.*

B7.2 MAXIMUM ANNUAL TONNAGE

The onsite equipment can process a maximum of 30,000 tonnes of WEEE per year, operating on a 24 hour basis. In addition, the facility will accept ODS containing items (typically fridges and freezers) and temporarily store them in a dedicated area prior to transferring them to an appropriately licensed facility for recycling/disposal. It is anticipated that a maximum of 8,000 tonnes per year of WEEE will be stored onsite on a temporary basis.

This gives a combined maximum tonnage of 38,000 tonnes per year of WEEE passing through the facility gates.

The tables below are also presented in *Attachment H.4* and indicate the maximum amount of waste anticipated to be processed at the facility until 2009, at which stage, it is anticipated that the facility will have reached its maximum processing capacity.

Waste to be processed under Class 3 of the WMA 4th Schedule (Recovery) Activities

Year	Non-hazardous Waste (tonnes /year)	Hazardous Waste (tonnes /year)	Total Annual Quantity (tonnes /year)
2006	1,250	2,500	3,750
2007	5,667	11,333	17,000
2008	10,000	20,000	30,000

Waste to be processed under Class 13 of the WMA 4th Schedule (Recovery) Activities

Year	Non-hazardous waste (tonnes /year)	Hazardous Waste (tonnes /year)	Total Annual Quantity (tonnes /year)
2006	0	8,000 (1)	8,000
2007	0	8,000	8,000
2008	0	8,000	8,000

(1) This figure is based on the Site receiving two thirds of the estimated total volume of fridges and freezers to arise in Ireland each year, as outlined in the WEEE Task Force Report, April 2004, (12,750 Tonnes per annum).

Waste Types and Quantities to be Accepted

WASTE TYPE	Tonnes/year (existing)	Tonnes/year (proposed)	Total Tonnage (over the life of site)
Household	0 Note (1)	0	0
Commercial	0 Note (1)	0	0
Sewage Sludge	0	0	0
Construction and Demolition	0	0	0
Industrial Non-Hazardous Sludges	0	0	0
Non-Hazardous Solids	1,660	9,940	199,880
Hazardous ***(Specify detail in Table H 1.2)**	3,333	28,006 recovered (maximum proposed) and 8,000 held in storage for off site processing	560,120 recovered and 160,000 transferred
Inert Waste imported for restoration purposes	**0**	0	0

(1) WEEE arising from either a commercial or household source is considered to be hazardous waste. The WEEE arriving at the Site is anticipated to arise predominantly from commercial/municipal sources. This will include Local Authority collection points, retailer drop-offs and third part transportation operations (permitted waste collection companies).

Hazardous Waste Types and Quantities to be Accepted

Reference was made to the European Waste Catalogue Codes as presented in Commission Decision 2000/532/EC

HAZARDOUS WASTE	DETAILED DESCRIPTION	Tonne/yr (Existing)	Estimated Tonnes/year (Proposed)
Transformers and capacitors potentially containing PCBs	16 02 09* To be held onsite in quarantine & transferred to a licensed contractor.	0	10
Discarded equipment containing or contaminated by PCBs, other than those mentioned in 16 02 09	16 02 10* To be held onsite in quarantine & transferred to a licensed contractor.	0	10
Discarded equipment containing chlorofluorocarbons, HCFC or HCF	16 02 11* To be held onsite in quarantine & transferred to a licensed contractor.	0	8,000
Discarded equipment containing free asbestos	16 02 12* To be held onsite in quarantine & transferred to a licensed contractor.	0	10
Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 012	16 02 13* Processed & recovered onsite.	0	19,966
Fluorescent Light tubes and other mercury containing devices	20 01 21* Either held onsite in quarantine & transferred to a licensed contractor, or processed onsite in a specialist mobile unit.	0	10
Lead Batteries	16 06 01* To be held onsite in quarantine & transferred to a licensed contractor.	0	5
Ni-Cd Batteries	16 06 02* To be held onsite in quarantine & transferred to a licensed contractor.	0	3
Mercury Containing Batteries	16 06 03* To be held onsite in quarantine & transferred to a licensed contractor.	0	2
TOTAL			**28,006**

B7.3 FEES

The following provides a summary of the fees being submitted as per Part 1 of the Second Schedule of the *Waste Management (Licensing) Regulations 2004.*

Waste Activity	**Fee in €**
Recovery of Waste	10,000

Seveso II Declaration

Attachment B8

The *EC (Control of Major Accident Hazards involving Dangerous Substances) Regulations, 2000* (S.I. No. 476 of 2000) does not apply to this application.

There are no hazardous substances stored at quantities which exceed the trigger thresholds specified in the Directive.

Technical Competence & Site Management

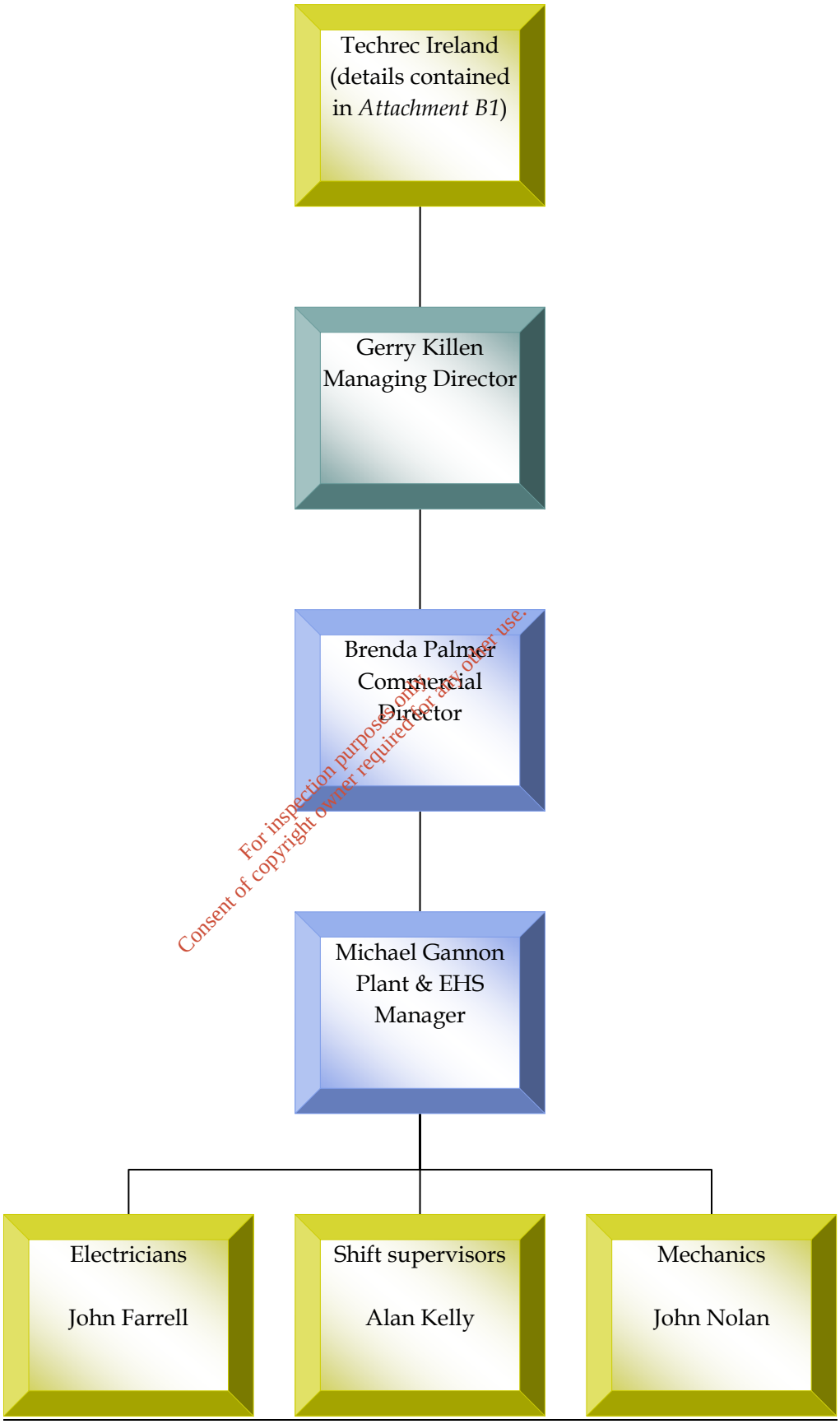
Attachment C1

C.1 TECHNICAL COMPETENCE AND SITE MANAGEMENT

The following Table and Organisation Chart provides a summary of the key personnel involved at the Site, and their roles in the day-to day operation of the facility.

Name	Position	Duties and Responsibilities	Experience /Qualifications
Gerry Killen	**Managing Director**	Overall responsibility for smooth operation and compliance of processing facility.	Gerry has over 25 years experience of general management in Irish and international business. Founder and CEO of Capital Leasing plc. for 12 years, he oversaw its public floatation and subsequent sale to an international banking group. Gerry has also worked with Bord Bainne in Dublin, Continental Grain in London and New York and more recently has been involved in the expansion of the O'Briens Sandwich Bar chain in Dublin.
Brendan Palmer	**Commercial Director**	Sourcing of WEEE for Processing plant and interface with corporate customers, local authorities, collectives etc.	Formerly Managing Director of Electronic Recycling, Brendan has been involved in the management of electronic waste since 1996. He has extensive knowledge of the industry and developed the business of Electronic Recycling using the WEEE Directive as an operations template.
Michael Gannon	**Plant and EHS Manager**	Responsibility for the day to day operations of the plant and management of all processing staff. Management of Environmental and Health & Safety issues.	Formerly plant manager of the Electrofast group Michael previously worked for 3 Comm where he set up and managed a complete product production line and at Telemacanique Ireland. Michael has spent several months in Switzerland being trained in the operation of the plant, including maintenance and trouble shooting techniques.
Alan Kelly	**Shift Supervisors**	As above but to a lesser degree. Responsible for Goods Inwards and data capture for We3 Software.	Previous logistics experience in large multinational. Reporting to Michael Gannon, Operations Manager
John Farrell	**Electricians**	Adherence to environmental procedures, energy conservation and preventative maintenance system operation. Responsible for smooth electrical operation of the Plant. Having been fully involved in the complex Installation process following the commissioning of the ESB sub Station.	Previous experience with a large Irish Electrical contractor. Reporting to Michael Gannon, Operations Manager.
John Nolan	**Mechanic/ Fitter**	Adherence to environmental procedures, inspection and management of drains, bunds, flanges and valves and preventative maintenance system operation.	Substantial experience of ongoing maintenance and refurbishment of process facilities, turbine engines and complex engineering plants. Reporting to Michael Gannon, Operations Manager.

Organisational Chart



Environmental Management System

Attachment C2

C.2 ENVIRONMENTAL MANAGEMENT SYSTEMS

The environmental management system (EMS) for the Site is to be developed over a period of approximately 18 months from the date of commencement. The system will take into consideration practices that have been used in similar sites and the technology that is to be implemented here in Ireland. A sister company in America using the same technology has achieved ISO 14001 accreditation and it is the intention of the Operator to apply for the same accreditation, once the system has been established.

Integral to this will be the software package, *We³ Recycler* that has been installed on the Site to help manage the tracking of WEEE from the time it arrives, through the process, until final reuse or disposal off the Site. The software modules have been developed specifically to support the recycling process of:

- WEEE (White and Brown Goods);
- IT equipment;
- End of Life Vehicles; and
- General Waste (Plastics, Paper, Household etc).

In order to provide a full audit trail for inbound waste, it provides the following functions:

- Automates transfer of 'duty of care' from owner to recycler by electronically capturing the in-bound waste details, such as weight, volume, make, model, owner and logistic information through the use of hand-held PDAs.
- For specific products, managing workflow processes for the de-manufacturing of WEEE by issuing a bar code at the check-in stage. The bar code provides details of the particular workflow of the equipment, whether it is to be recycled, harvested or remarketed. The bar code also indicates what stages of the process the equipment is at. This ensures that the equipment has been processed correctly.
- Detailed Workflow and Knowledge Management instructions to allow for the optimised recycling of products

Once processed, the *Recycler* module (depending on waste type) will book the finished goods, raw commodities, complete systems and spare parts into the Site inventory.

By using the *We³ Recycler*, the Operator can provide their customers with full documentation of the transfer of 'duty of care' from the owner to the recycler. By attaching work flow processes, they can also ensure that the equipment is processed in the correct manner.

The procedures to be developed as part of the EMS will cover a wide range of topics and examples of the types of procedures to be developed are listed

below. It should be noted that this list is indicative of the procedures that may be developed.

1. Waste acceptance criteria
2. Waste receipt and recording procedure
3. Preliminary waste separation procedure
4. Identification and management of contaminated WEEE
5. Module 1 operational procedures
6. Module 2 operational procedures
7. Module 3 operational procedures
8. Module 4 operational procedure
9. Procedure for the removal and storage of oil from WEEE
10. Spill containment and clean up procedure
11. Spill kit checklist
12. Environmental reporting procedures
13. Incident recording procedure
14. Public consultation procedures
15. Waste management procedure
16. Record keeping procedure
17. Equipment inspection and maintenance procedures
18. Management and maintenance of air abatement equipment
19. Emission monitoring procedure
20. Management of bunded areas
21. Management of quarantine area
22. Inspection procedure for flanges and valves
23. Inspection procedure for drains and bunds
24. Communication procedures
25. Emergency response procedure and training
26. Environmental awareness training
27. Assessment of environmental aspects and impacts
28. Register of environmental aspects
29. Register of environmental legislation
30. Management, review and maintenance of the EMS
31. Procedure for compilation of Annual Environmental report
32. EPA reporting procedure
33. Notifying incidents to the EPA and county council
34. Communicating information to the public and interested parties
35. Reporting environmental performance
36. Auditing of waste contractors
37. Energy conservation
38. Recording and reporting of complaints
39. Assessing the environmental impacts of new developments
40. Internal reporting of non-conformances and corrective action procedure
41. Internal audit procedure

Operation manuals are provided with all the equipment and will form the basis for the points 4 – 7 inclusive. A copy of the Manuals for the key process and abatement equipment has been included separately as commercially sensitive information.

Hours of Operation

Attachment C3

C.3 HOURS OF OPERATION

It is intended that the facility will eventually operate on a twenty four hour basis. Operation at this continuous level will not commence until approximately 2007.

Processing will be ramped up to this level over a period of time and therefore the shift characteristics of the operation are likely to change as processing increases. Shift work is generally undertaken over a twelve or eight hour cycle.

(a) Operational hours
Monday to Sunday 24hrs

(b) Hours of waste acceptance on site:

- Monday to Friday 07:00 – 20:00
- Saturdays 08:00 - 18:00
- No waste accepted/removed on Sundays and Public Holidays

(c) Not applicable

(d) Transportation of final fractions offsite:

- Monday to Friday 07:00 – 20:00
- Saturdays 08:00 - 18:00
- No waste or final fractions are anticipated to be removed on Sundays and Public Holidays

It is noted that Saturdays and Sundays are likely to be designated as times for maintenance to be carried out, however the Operator wishes to have the option to operate the facility, if required, during these times.

Site Infrastructure

Attachment D1

D1 INFRASTRUCTURE & OPERATION

D1.a Site Security Arrangements

The management company responsible for the Park West Industrial Park provide a 24hr security service. The facility itself is not surrounded by a specific fence or gate, however, the building is protected by both an intruder and fire alarm system. These are connected by radio and telephone to a remote monitoring company. The Operator also plans to install external CCTV cameras linked to the same system.

The process is to be run 24hr per day and will be manned at all times. All operations are carried out internally and there are no external activities (other than vehicle movements) or storage areas.

The Operator is confident that current and proposed security measures are adequate for the nature of the facility.

D1.b Design of Site Roads

There are no internal roadways associated with the facility.

Access to the Site is directly from Henry Road, to internal hard-standing areas at the northern end of the Site. These areas will be used to allow vehicle movements into/and out of the docking bays. Onsite parking in these areas by Site personnel will not be permitted.

The roads within Park West Industrial Estate are maintained by the Management Company responsible for the Park West Industrial Estate.

Drawing 02 shows the layout of the roads within the industrial estate and the national roads in the local area.

D1.c Design of Hard-standing Areas

The areas external to, and adjacent, the production building are covered with either concrete or tarmacadam hard-standing as follows:

- The unit is surrounded by concrete paving/footpath (1.2m wide), on all sides, except along the loading bay (to the north). These areas extend from the edge of the building to the site boundary.
- All other external areas to the east, south and west are all covered with tarmacadam.

The exception to this is a small grassed verge along (and outside) the Site boundary to the east, south and north. These areas are under the control of the Park West Management Company.

There are four loading bays present along the north site entrance which contain integral docking units. The bays slope towards the building and any surface water is directed to an open grated drainage system at the bottom of the bays. This drain discharges to the Industrial Park's surface water collection system. In addition, there is a network of gullies that collects surface water from the Site's roof and exposed areas along the north, south and west sides. This is also discharged to the Industrial Park's surface water collection system.

There are no oil/water interceptors or emergency shut-off valves present in the surface water system, and none are considered necessary given the nature of the onsite activities.

The hard-standing areas and surface water drainage in the areas are highlighted in *Drawing 09*.

D1.d Plant

Weighbridge

Drawing 04 the location of the weighbridge on site and the specification of the weighbridge are as follows:

Make:	Gravitation Limited
Model:	Cardinal 210 St. St., with Bright LED Display and Keypad and Push Button Tare
Size:	1,500mm x 1,200mm
Capacity:	2,000 kg x 0.5 kg
Deck Material:	Mild Steel, Chequerplate Deck
Load Cells:	Four High Accuracy, 1,000 kg Cells
J-Box:	Trimming and Summation Board

Additional features that were added to enhance its usability include:

- Traffic lights;
- CCTV camera and VDU mounted in the goods inwards office;
- Remote Displays; and
- Ticketing machine.

The weigh bridge is linked to the *We³* computer tracking and reporting system that has been installed on site. This allows for individual ID's to be assigned to each load that arrives on site and calculation of the amount of WEEE arriving on site.

Sweeper

A *Karcher* "KM85/50W Walk behind vacuum sweeper", is used on site. The internal building area is sweep on a regular basis to assist in reducing the potential for fugitive air emissions from the Site.

Baler

There is a bailer on site used to compact scrap iron sorted form the WEEE in Module 1 and 2. The baler details are below:

Make:	Franz Arnold Sohne
Type:	SP – 100AR
No:	V-194
Maximum D:	1,001
Date:	03/07/1969

Forklift trucks

There are 3 diesels rid-on and 5 electric hand operated, forklift trucks used on site. Maintenance of the forklift truck will be carried out off site under contract. All diesel trucks have been fitted with filter and are designed to operate within buildings.

D1.e Wheel Wash

There are no wheel wash facilities present on the Site, and none are considered to be necessary given the nature of the activities.

D1.f Laboratory Facilities

There are no onsite laboratory facilities associated with this activity, and none are considered to be required.

D1.g Design and Location of Fuel Storage areas

The only fuel to be stored on the Site is diesel for the refuelling of the forklift trucks.

The diesel will be stored in a purpose designed 1,200L aboveground storage tank, which will be provided with integrated secondary containment for both the tank and the fill point. The specifications for the tank are as follows:

- Dimensions – 1250mm(W) x 1,500mm(D) x 1,250mm(H);
- Construction – fully welded pressure tested steel tank;
- Bunding – enclosed steel bund with minimum capacity 110% of the tank;
- Material thickness – 4mm steel;
- Paint finish – polyurethane paint;
- Fittings – 2" fill point c/w, gate valve, vent, sight level gauge, 1" outlet;
- Security – anti-vandal compartment within bund to secure fill and outlet points, pump, flowmeter, etc. and door fitted with anti-tamper pad lock box;
- Bund alarm; and
- Spill deck.

The location of the tank is highlighted in *Drawing 04*.

The diesel storage tank will be located within the building in the north-eastern corner. Refuelling of the tank is to be carried out from a bulk diesel tanker which will drive into the Waste Acceptance Area to access the tank. A procedure for the refuelling of the diesel storage tank and forklifts will be developed as part of the EMS.

D1.h Waste Quarantine Area

A specific Waste Acceptance Procedure is being developed and will be integrated into the Site's Environmental Management System (EMS).

While the Site will accept all types of WEEE, any item that is suspected of containing ODS, PCBs or asbestos, or which does not meet other specified criteria, will not to be processed on site. Such material will be held in a dedicated Quarantine Area in the north-east portion of the Site, prior to transfer to an appropriately licensed contractor.

It is anticipated that the majority of WEEE arriving on Site will be handled through contracts which will stipulate that all WEEE potentially containing ODS, PCBs or must be identified and notified to the Site, prior to arrival. This will help ensure that appropriate arrangements can be made for its transport to an appropriately treatment facility. The Site will use licensed hazardous waste contractors who are members of the One51 Limited group of companies, for the majority of the waste transfers.

It is recognised that it is sometimes difficult to establish if WEEE is potentially contaminated, particularly with older or unlabeled equipment. The Site will develop a list of equipment that could potentially contain such substances is to aid in the identification of such items (e.g. by manufacturer, age, company of origin etc). Once such waste is identified, it will be removed from the Waste Acceptance/ Inspection Area and held in the quarantine area prior to removal.

There are no floor drains present inside the building and the entire production floor is comprised of high quality, solid concrete. In addition, the Quarantine Area will be provided with appropriate secondary containment (e.g. pallet bunding) for the storage of items potentially containing liquids.

Potentially hazardous components (e.g. batteries, transformers, capacitors etc) which are removed during the process will also be stored in the Quarantine Area, prior to transfer to appropriately licensed contractors. To ensure their safe storage and handling, the Quarantine Area will be provided with purpose designed storage facilities for the collection of fluorescent tubes (in metal lamp coffins), segregated plastic containers for wet and dry batteries and 205l metal drums on portable bunded pallets for decanted oil.

All areas will be clearly delineated and provided with appropriate signage. The production building, and specifically the Quarantine Area, will be provided with sufficient and appropriate spill kits. *Drawing 04* details the location of the Quarantine Area.

D1.i Waste Inspection Area

The majority of waste is expected to arrive at the Site in relatively large quantities, (i.e. in vehicles >6.5 tonnes). These vehicles will be directed to use the docking stations in the loading bays.

Smaller vehicles will be unloaded within the building at the waste inspection area. The area is big enough to allow for the safe movement of vehicles, forklifts and personnel. A portable bunded pallet and spill kit will be located in the area as a safety measure.

When any WEEE arrives it will be unloaded and immediately inspected as per the Waste Acceptance Procedure for the Site.

The Waste Inspection Area is located internally in the north-east corner of the building. The area is provided with a solid concrete floor and its location is highlighted on *Drawing 04*. The area will be big enough to allow the preliminary separation of the waste into several basic categories – depending in the proposed processing techniques (i.e. it can either proceed straight into Module 2, or be manually dismantled in Module 1, or be placed in quarantine).

D1.j Traffic Control

Traffic associated with the Site will be comprised of vehicles delivering and removing WEEE and processed fractions.

There are ten car and four truck parking spaces located at the front (north) of the building, as shown in *Drawing 05*. However, as employees have an extensive range of transport options open to them, as outlined in *Annex D1-1 (*Park West Transport Plan*),* the Operator does not propose to allow onsite employee parking.

Employees who choose to travel by car will be required to use facilities within the Park West Industrial Park. For a drawing of the Site Car Parking area see *Drawing 05*. It is anticipated that a maximum of four parking spaces will be required for management and the remainder will be set aside for visitors or for the temporary parking of small vehicles delivering WEEE, (prior to being processed within the building).

All vehicles delivering WEEE will be required to use the weighbridge in the north-east corner of the Site, as highlighted in *Drawing 04*. It is anticipated that at maximum capacity, there will be up to 42 vehicle movements (both trucks and delivery vans) per day. This is based on a maximum annual

throughput of 38,000 tonnes of WEEE per annum, (730 tonnes per week), and further assumes that deliveries will be over a six day week and each truck has an average load of approximately eight tonnes. This gives an estimate of 15 trucks per day, excluding small delivery vans and private vehicles.

There are four truck docking bays, located along the front (North) of the building, with two either side of the car parking area. The Operator does not own any of the delivery vehicles and long term parking of delivery trucks will not be permitted on the Site.

The unloading of trucks is expected to take approximately 45minutes, as the WEEE is to be delivered on pallets. WEEE is also expected to arrive onsite from Civil Amenity Facilities in dumper trucks. These will empty their load directly into the WEEE acceptance area within the building (rather than using the docking bays) and will have a much shorter turnaround time. In the situation where more than one truck arrives on the Site, they can be weighed and parked in one of the spare spaces, prior to being moved into a vacant unloading bay. Alternatively, the vehicles may be temporarily parked along the western side of the building (within the Site boundary).

Processed material will also be removed from the Site. All processed material will be transported on articulated trucks and each load is anticipated to average 20 tonnes. Vehicles removing processed fractions (and wastes) from the Site will be scheduled on demand, and can be loaded and dispatched quickly as the end fractions will be pre-assembled into appropriate transportation units (e.g. metal bales, 1 tonne bags or crates). Based on the same throughput numbers above, six trucks a day will be required to move this material off-site. Combined, with the incoming WEEE, this represents a total estimate of 21 trucks per day, which represents 42 individual truck movements per day.

The facility unit was previously operated as a warehouse/distribution centre and was designed to handle large trucks and frequent vehicle movements. It is therefore well equipped for the parking, loading and manoeuvring of such vehicles.

In addition, a Transportation Plan was developed (by the Park West Management Company and is included as *Annex D1-1*) during the original EIA which covers the entire industrial estate. This specifies the potential impacts and controls associated with traffic movement within the estate.

D1.k Sewage and Surface Water Drainage Infrastructure

Park West Industrial Park was redeveloped by *Harcourt Development Ltd* in the late 1990's and early 2000's. During that time, the pre-existing drainage system was upgraded to have the capacity to deal with the wastewater volumes expected to arise from the Site and its neighbouring facilities. *Drawing 09* identifies the current foul sewer and surface water drainage systems for the Site.

It should be noted that the current Site activities do not intend to alter the existing drainage system and does not have any specific process water emissions. The only wastewater emission from the Site will be sanitary effluent from the staff facilities. These are connected to the municipal sewer and are discharged without treatment.

The following provides a description of the surface water and foul sewer infrastructure within the Park West Industrial Estate, and its links to the subject Site

Surface Water

There are five connections from the Site to the local surface water system as shown on *Drawing 09*. These drainage points discharge clean rainwater from the building roof and external hardstanding areas, to the sub-surface stormwater drainage pipeline running along the northern edge of the Site. This pipeline also receives surface water runoff from properties and other hardstanding areas, located both upstream and downstream of the subject Site. This pipeline connects to the shared on-site surface water drainage system within the Industrial Estate which eventually discharges to the Gallanstown stream as described below.

The northern half of the Industrial Park (including the subject Site), drains in an easterly direction to an 8' x 4' culvert, which runs in an easterly direction along the northern edge of the Park, to the north-east corner. At this point, it changes direction and runs southwards to a manhole (MH1) located in the south-east corner of the Park.

Immediately after MH1, the culvert takes the form of 4 x 300mm diameter sewer for approximately 30m and then continues as a box culvert running eastwards from the Park. This culvert joins the culvert at the Gallanstown stream, approximately 200m east of the Park and its upstream catchment.

There is also a 225mm diameter surface water drain running from the southern end of the building alongside the western side of the building. This expands into a 300mm diameter drain which continues along the western side of the building and continues past the building in a north-eastern direction. At a surface water drain (SW-1) the drain expands into a 450mm diameter drain continuing in a north-eastern direction and passing through another surface water drain (SW-2). After passing the second surface water drain (SW-2) the drain becomes parallel to the main stream surface water pipe. *Drawing 20* shows all surface water drains for the Site.

Sewage

There is one discharge to the municipal sewerage system from the Site. This is from the staff sanitary and amenity facilities. There are no process or trade waste discharges. The discharge point from the building is shown on *Drawing 09* and links into the existing 300mm diameter sewer in the south-eastern

corner of the site. This sewer pipeline runs in a south eastern direction and joins a manhole located at the south-east corner of the Industrial Park, adjacent to Killeen road. It is understood that these discharge lines are dedicated to the buildings within the Industrial Park and serve no external areas.

There are also two 225mm diameter sewer pipelines running in an easterly and westerly direction along the southern end of the Park, which discharge to a main council sewer on Killeen road and eventually end up in the Ringsend Wastewater Treatment facility.

There is a combined main council surface water and foul sewer on the Killeen road. This is a 600mm diameter pipeline along the Killeen Rd and expands to a 675mm diameter pipeline running parallel with the Gallanstown Stream. This foul sewer also discharges to the Ringsend waste water treatment plant, where the effluent receives primary secondary and tertiary treatment.

D1.1 All other services

Electricity

An electricity sub-station and associated services and rooms are located in the south-west corner of the building as highlighted in *Drawing 04*. The substation is owned and operated by the Site and was constructed in accordance with the Electricity Supply Board's (ESB) specifications, (*Specification Number: 13320*).

There are four electrical supply rooms in the facility as outlined below:

1. ESB Room is not accessible by TechRec.
    - This room contains ESB medium voltage switch gear.

2. TechRec M. V. Switch-room (to which TechRec staff have access). This room contains:
    - Unimix 10 KV switchgear
    - Battery Tripping Alarm Panel
    - ESB Metering cabinet

3. TechRec MV – LV Transformer Room contains:
    - 1,000 KVA ONAN oil filled transformer

4. TechRec LV Switchroom contains:
    - L.V. Main Switch-room
    - L.V. Sub-Distribution Switchboard
    - L.V. Power Factor Correction Unit

Compressor

Compressed air is provided throughout the site by a *Kaeser* air compressor, (Model ASK 32T), which is located internally beside the LV Switchroom in the

southeast corner of the building. The air will be temporarily held in a 1,000L pressure vessel (adjacent to the compressor). Condensate emissions, which may potentially contain hydrocarbon material, will be discharged through a dedicated oil/water separator (an *Aquamat 2* system). This will separate residual dirt and oil from the wastewater. The collected dirt/oil will be collected within the unit (which is provided with secondary containment) and will be disposed of with an appropriately licensed waste collection operator. The water will be collected in a drum and disposed offsite. The water will be tested for hydrocarbon residue and will disposed as either a hazardous or non-hazardous waste, as appropriate. Additional details relating to the operation of the *ASK 32T* Compressor and *Aquamat* 2 oil/water separator are provided in *Annex D1-2*.

Water Supply

All water used on the Site is sourced solely from the Dublin City Council mains supply. There are no meters on this incoming supply. There are no groundwater or surface water abstraction points used by the Site.

The Park West Industrial Estate is serviced by a private water supply pipeline that links to the municipal pipeline along the south of the Park and runs in an east –west direction. There is also an additional water main along the front southern edge of the Park which runs in an east-west direction.

There is an existing 300mm diameter water main running along the Killeen Road adjacent to the Site.

The water main links into the Site from a single entry point on the northern boundary.

Telecommunications

Telephone, fax and IT connections are provided to the Site and are located in the ground floor of the offices.

Gas

There is a piped gas supply to the Site which is maintained by Bord Gais. The supply joins the site in the north-east corner. The site does not intend to use the supply. The supply is linked to the Sites space heaters for the main body of the building, which may require their use during periods of extreme cold.

D1.m Plant Sheds, Garages and Equipment Compounds

There are no external buildings or storage areas associated with this development, other than the main building shown in *Drawing 10*.

There is a maintenance area within this building, shown in *Drawing 10*, where critical spares and other equipment are held.

Forklift trucks will be parked within the production building at the end of each day. The forklift trucks are to be maintained by an outside contractor. Minor works will be carried out onsite adjacent to the maintenance area. However, any major maintenance works would be undertaken offsite at the service contractor's facility. Spill kits will be held at all times in the maintenance area.

D1.n Site Accommodation

The main onsite staff facilities are provided within the production building along the northern wall. This comprises a two storey unit containing the reception, offices, associated storage areas, IT/telecommunications area, a meeting room, toilets and small canteen/kitchenette.

Additional facilities are provided in the north-west corner of the building where toilets/showers, a changing area and canteen have been installed.

There is also a temporary office space (in a porto-cabin) installed in front of the main offices inside the building. It is proposed that this temporary container will be removed in the near future and a third level will be added onto the main office area.

The location of these facilities is highlighted in *Drawing 04*.

D1.o Fire Control System, Including Water Supply

The facility holds a fire certificate, a copy of which is attached in *Annex J1-2* of *Attachment J1*. Fire hydrants are available around the perimeter of the Site, however, there are no permanent fire suppression systems (e.g. sprinklers), within the building.

Fire hoses are not permitted within the building for safety reasons, however fire extinguishers are provided at several locations (as indicated in *Drawing 11*).

Given the nature of the activities and products involved, the Operator considers the Site generally poses a low fire risk. The Hammer Mill and QZ Machine have been identified as two pieces of equipment with a potentially higher fire risk. For this reason, a specifically designed water-based quench system has been installed above each of these machines. A summary is provided as follows.

QZ and Hammer Mill Quenching System

A temperature sensor has been installed at the exit point of both items of equipment. This is linked to a digital controller mounted beside the original control and monitoring panel on each machine. In the event of the temperature exceeding a pre-set value, a flashing beacon and an audible alarm

will be initiated to alert staff. In the event that the temperature continues to rise to a value in excess of a predefined differential value, a two port solenoid valve on the water line will be energised and will initiate the water drench into the equipment. The system will be incorporated into the overall plant monitoring and control system and is alarmed.

This system will only be used in extreme emergencies and the majority of the water released would be evaporated in the quench process. In addition, there are no floor drains inside the production building and any residual water would be mopped/vacuumed up. Therefore, this potential wastewater discharge is not considered a routine emission point.

D1.p Civic Amenity Facilities

There are no civic amenity facilities planned on the site. The facility will only accept WEEE.

D1.q Any Other Waste Recovery Infrastructure

Certain types of WEEE will contain oily/water residues. Examples include electrical radiators (water) and transformers (oil), both of which would have to be drained of any residual liquids prior to processing. Such activities will be carried out in a designated and contained area as highlighted in *Drawing 04*.

A purpose designed work station will be installed to allow such items to be drained of any liquids into dedicated 205l metal drums. These drums will be labelled and segregated according to content, and will be located beside the work station on bunded pallets.

Once the drums are full, they will be removed from the area and stored in the Quarantine Area, prior to being transferred to a licensed hazardous waste contractor. (The waste liquids will be sent for recycling or disposal as appropriate).

Initially, fluorescent lamps will be collected onsite prior to transfer to a licensed contractor for recycling. At a later stage, the Operator proposes to recycle such items onsite, using a purpose designed mobile plant. Further details of this process are provided in *Attachment D.2*.

No other waste recovery infrastructure is planned.

D1.r Composting Infrastructure

No composting activities will take place on the Site and no organic material will be accepted.

D1.s Construction and Demolition Infrastructure

No construction or demolition waste will be associated accepted or processed on the Site.

D1.t ***Incineration Infrastructure***

No incineration will take place on the Site.

D1.u ***Any Other Infrastructure***

No other infrastructure is planned on the Site.

Annex D1-1 Park West Estate Transport Plan

July 2005

Transport Plan

Park West, Nangor Rd
Dublin 12, Ireland
+353 1 475 3928
www.parkwest.ie

Contents

1. Introduction

Park West is a 93-hectare (230 acre) business and residential campus situated in west Dublin by the M50/Naas Road interchange, 6.4 km (4 miles) southwest of Dublin's city centre (O'Connell Bridge) and approximately 20 minutes from Dublin International Airport.

There are many different transport options available in Park West. Firstly, the campus has its own on-site **Arrow** line railway station, Park West/Cherry Orchard, which is one stop from Heuston Station - Dublin's main rail terminus.

Heuston station links a number of regional rail lines and connects to the **DART** network via the LUAS Red Line (tram-line – see Section 8) in operation since October 2004.

The **Arrow** line is an established commuter route serving a number of major satellite towns to the south and southwest of the city. Work has begun on the National Development Plan's recommendation to upgrade this line to four-track line incorporating a full commuter service between Newbridge and Heuston. A new railway station in Park West is planned and will replace the existing Park West/Cherry Orchard station.

There are three **vehicular** entrances to the campus. The main entrance is from the Nangor Road, which adjoins the Naas Road/N7 and M50 orbital motorway – the heart of Ireland's road network. Secondly, at the northern boundary of the park is the Cloverhill Road, which links to the N4 / Galway Road & M50 via Liffey Valley. Thirdly, the Killeen Road entrance, at the eastern side of the Park, offers access via Ballyfermot/Kylemore Industrial Estate.

The **LUAS** Red Line is a light-rail (high-speed tram) from Tallaght to the City Centre (Connolly Station). The LUAS stops near Park West at Kylemore Road. Park West provides a feeder bus service to and from the Kylemore stop on the Naas Road (timetable in Section 2).

Several private & public **bus services** operate from Park West to the city centre, utilising the available QBCs (Quality Bus Corridors: bus lanes). Work is currently in progress on a QBC along the Nangor Rd., which will allow for travel to the city centre on a virtually uninterrupted QBC. Full details are provided within sections 2 & 3.

Another innovative option, the Park West **car pool,** is detailed in Section 6 of this document.

Finally, an extensive network of **cycle** lanes exists in Park West and the surrounding areas.
Bike racks are provided on campus.

Overall, Park West provides a number of alternatives to car-based access.

2. Park West Shuttle Service (private pre-paid service)

860 route Monday to Friday

College Green Westmoreland Street Usher Island Heuston Station Inchicore (Gaol) Ballyfermot Rbt. Park West	06.30 – 07.00 – 07.30 – 08.00 – 08.30 – 09.00 – 09.30 – 10.30 – 11.30 – 12.30 – 13.30 – 14.15 – 15.15 – 16.00 – 16.30 – 17.00 - 17.35 – 18.10 – 18.40 – 19.30 – 20.30 – 21.30 – 22.30
Park West Ballyfermot Rbt. Inchicore (Gaol) Heuston Station Usher Island Westmoreland Street College Green	07.00 – 07.30 – 08.00 – 08.30 – 09.00 – 09.30 – 10.00 – 11.00 – 12.00 – 13.00 – 14.00 – 15.00 – 16.00 – 16.30 – 17.00 – 17.30 – 18.10 – 18.40 – 19.00 – 20.00 – 21.00 – 22.00 – 23.00

Saturday & Sunday

Depart City Centre:	Depart Park West
14:15 15:15	14:40 15:40

Shuttle Bus Link – LUAS / Kylemore Rd (private)

Depart McDonald's	*Depart Park West*	*Depart Park West*	*Depart McDonald's*
07:00	07:15	16:00	16: 15
07:30	07:45	16:30	16:45
08:00	08:15	17:00	17:15
08:30	08:45	17:30	17:45
09:00	09:15	18:00	18:15
09:30		18:30	

Updated July 05

Tickets for both services can be purchased online at www.amconline.ie. Alternatively you can buy your 10-journey pass in Spar, the Plaza, Park West Business Park, Dublin 12. The LUAS service costs €1 each way payable to the driver. Pick up and drop off point is at McDonalds on the Kylemore Road.

3. Dualway Bus Timetable (private)

ROUTE 613 MONDAY-FRIDAY

Fare Structure: Minimum Fare € 1.00 Maximum Fare € 2.00
Please refer to www.dualwaycoaches.com
or see fare structure posted on bus
Free Travel Passes Accepted

TIMETABLE EFFECTIVE FROM MAY 30th 2005 UNTIL FURTHER NOTICE

FROM RATHCOOLE/LUCAN TO COLLEGE GREEN Monday-Friday							
Rathcoole	06h10	06h40	07h00				
Lucan	06h30	07h05	07h25	08h10			17h40
Park West	06h45	07h20	07h45	08h30	09h15	17h10	18h05
College Green	07h10	08h00	08h25		09h50	17h45	18h45

FROM COLLEGE GREEN TO LUCAN/RATHCOOLE Monday-Friday							
College Green	07h15	08h10	08h40		17h30	17h50	
Park West	07h45	08h40	09h15	17h10	18h05	18h25	
Lucan	08h00	09h00		17h30	18h25	18h45	
Rathcoole					18h45	19h05	

3. Dublin Bus Timetable (public)

This service uses wheelchair accessible buses

79/A	Operative Date 17/07/05								
	From ASTON QUAY								
	An Lár (Cé Aston), Céanna Theas, Dr. Heuston, Br. Eoin, Baile Formaid								
Journey time - 55 mins. approx.	MONDAY TO FRIDAY			SATURDAYS			SUNDAYS		
ASTON QUAY	0705A	1250A	1730A	0745A	1210A	1725A	1135A	1442A	1920A
15 mins.	0745A	1320A	1750A	0830A	1255A	1810A			
St. John's Road	0815A	1350A	1800A	0910A	1340A	1855A	1312A	1615A	2040A
(Heuston Station)	0845A	1420A	1825A	0955A	1425A	2015A			
20 mins.	0915A	1445A	1905A	1040A	1510A	2052A		1745A	2200A
Kylemore Rd.	0945A	1515A	1935A	1125A	1555A	2130A			
R.C. Church	1015A	1535A	2010A		1640A	2210A			
20 mins.	1055A	1555A	2100A			2250A			
SPIDDAL PARK (79) /	1125A	1620A	2150A						
PARKWEST (79A)	1155A	1645A	2240A						
	1220A	1710A							
	A = 79A to Parkwest								
	From SPIDDAL PARK / PARKWEST								
Journey time - 55 mins. approx.	MONDAY TO FRIDAY			SATURDAYS			SUNDAYS		
SPIDDAL PARK (79) /	0720A	1140A	1710A	0750A	1210A	1810A	1050A	1530A	1830A
PARKWEST (79A)	0740A	1210A	1740A	0825A	1255A	1855A			
20 mins.	0800A	1240A	1810A	0910A	1340A	1940A	1227A	1700A	2000A
Kylemore Rd.	0830A	1305A	1850A	0955A	1425A	2055A			
R.C. Church	0900A	1335A	1955A	1040A	1510A	2130A	1357A		2120A
20 mins.	0930A	1405A	2055A	1125A	1555A	2325A			

St. John's Rd.	1000A	1435A	2140A		1640A				2240A
(Heuston Station)	1030A	1540A	2225A		1725A				
15 mins.	1105A	1630A	2315A						
ASTON QUAY		1650A							

A = 79A from Parkwest

H = To Conyngham Rd garage only

* = via Neilstown Roundabout to City Centre

	STAGE		STAGE
25 75	Aston Quay	**32 68**	Sarsfield Rd.(Model Schools)
26 74	Essex Quay / Upr. Ormond Quay	**33 67**	Sarsfield Rd. (The Ranch.)
27 73	Mellowes Bridge	**34 66**	Decies Rd. (O'Hogan Rd.)
28 72	Sean Heuston Bridge	**35 65**	Kylemore Rd. (R.C. Church)
29 71	St. John's Rd. (Military Rd.)	**36 64**	Ballyfermot Rd. (The Gala)
30 70	St. John's Rd. (Islandbridge)	**37 63**	Clifden Rd (Blackditch Rd.)
31 69	Inchicore Rd. (Kilmainham) / Colbert Rd.	**38 62**	Spiddal Park (79) / Parkwest (79A)

Operated by Conyngham Road Depot. Telephone (01) 703 2172

Bus routes within walking distance of Park West:

- **51B CITY CENTRE** (Aston Quay) – **CLONDALKIN** (Dunawley)
- **51 CITY CENTRE** (Aston Quay) – **CLONDALKIN** (Neilstown)
- **68 CITY CENTRE** (Aston Quay)– **NEWCASTLE** (Ballynakelly)
- **69 CITY CENTRE** (Aston Quay) – **RATHCOOLE**
- **76 TALLAGHT** (Fettercairn) – **OLD LUCAN ROAD**
- **76A BLANCHARDSTOWN – TALLAGHT** (Fettercairn/Balrothey)
- **76B OLD LUCAN ROAD – TALLAGHT** (Balrothery)
- **210 DDOLPHINS BARN – LIFFEY VALLEY CENTRE**
- **18 PALMERSTOWN - SANDYMOUNT**
- **69X CITY CENTRE** (Aston Quay) – **RATHCOOLE**
- **51X WATERLOO ROAD – DUNAWLEY**

Monday to Friday Service only (excluding Bank Holidays).

5. Iarnród Èireann Train Timetable (Arrow Line)

Timetable from **Dublin Heuston** to **Kildare** stopping at **Park West**
For departure times Monday to Saturday

Dublin Heuston	*0635*	*0635*	*0740*	*0940*	*1100*	*1145*	*1310*	*1430*	*1528*	*1607*	*1718*	*1805*	*1845*	*1945*	*2040*	*2245*
Park West/Cherry Orchard	0641	0641	0746	0946	1106	1151	1316	1436	1534	1613	1724	1811	1851	1951	2046	2251
Clondalkin	0645	0645	0750	0950	1110	1155	1320	1440	1538	1617	1728	1815	1855	1955	2050	2255
Hazelhatch & Celbridge	0652	0652	0757	0957	1117	1202	1327	1447	1545	1624	1735	1822		2002	2057	2302
Sallins & Naas	0701	0701	0806	1006	1126	1211	1336	1456	1554	1633	1744	1831		2011	2106	2311
Newbridge	0710	0709	0814	1014	1135	1221	1344	1506	1602	1641	1753	1843	1916	2019	2114	2319
Kildare		0717	0825	1025	1145		1353		1612					2025	2122	2328

Kildare	*0645*	*0722*	*0840*	*0951*	*1035*	*1200*	*1250*	*1433*	*1515*	*1707*	*1850*	*1940*	*2045*	*2150*
Newbridge	0650	0728	0845	0956	1040	1205	1255	1438	1520	1712	1855	1945	2050	2155
Sallins & Naas	0659	0736	0854	1005	1049	1214	1303	1447	1528	1720	1903	1953	2059	2204
Hazelhatch & Celbridge	0708	0746	0903	1014	1058	1223	1313	1456	1538	1730	1913	2003	2108	2213
Clondalkin	0716	0754	0911	1022	1106	1231	1321	1504	1546	1738	1921	2011	2116	2221
Park West/Cherry Orchard	0719	0757	0914	1025	1109	1234	1324	1507	1549	1741	1924	2014	2119	2224
Dublin Heuston	0731	0804	0926	1035	1120	1246	1332	1519	1557	1748	1931	2022	2127	2232

Disclaimer: These times may change on Bank Holidays. Please check the times with your local train station.

6. Park West Car Pool

www.parkwestcarpool.com

Introduction

This is a free service for everyone who works in Park West. It is an internet-based bulletin board - www.parkwestcarpool.com – which can be used by anyone working in the campus to find others with similar journey with whom they can make car-sharing arrangements.

How it works

The website is simple to use. Just register your details onto the site using the **Form Entry Page.** You are only required to register your first name, your district of residence (chosen from a scroll-down list), a contact phone number (work or mobile) or email, and a personal password, (this personal password permits you, and you alone, to amend or delete your own details from the website).

Once you register, your contact and commuting details are displayed on the **Bulletin Boards**. Your details will permit others at Park West who wish to carpool to contact you, and vice versa.

You may enter your details onto more than one **Bulletin Board** (two or three would be advisable) as **Bulletin Boards** for neighbouring areas may also produce a suitable match.

Security

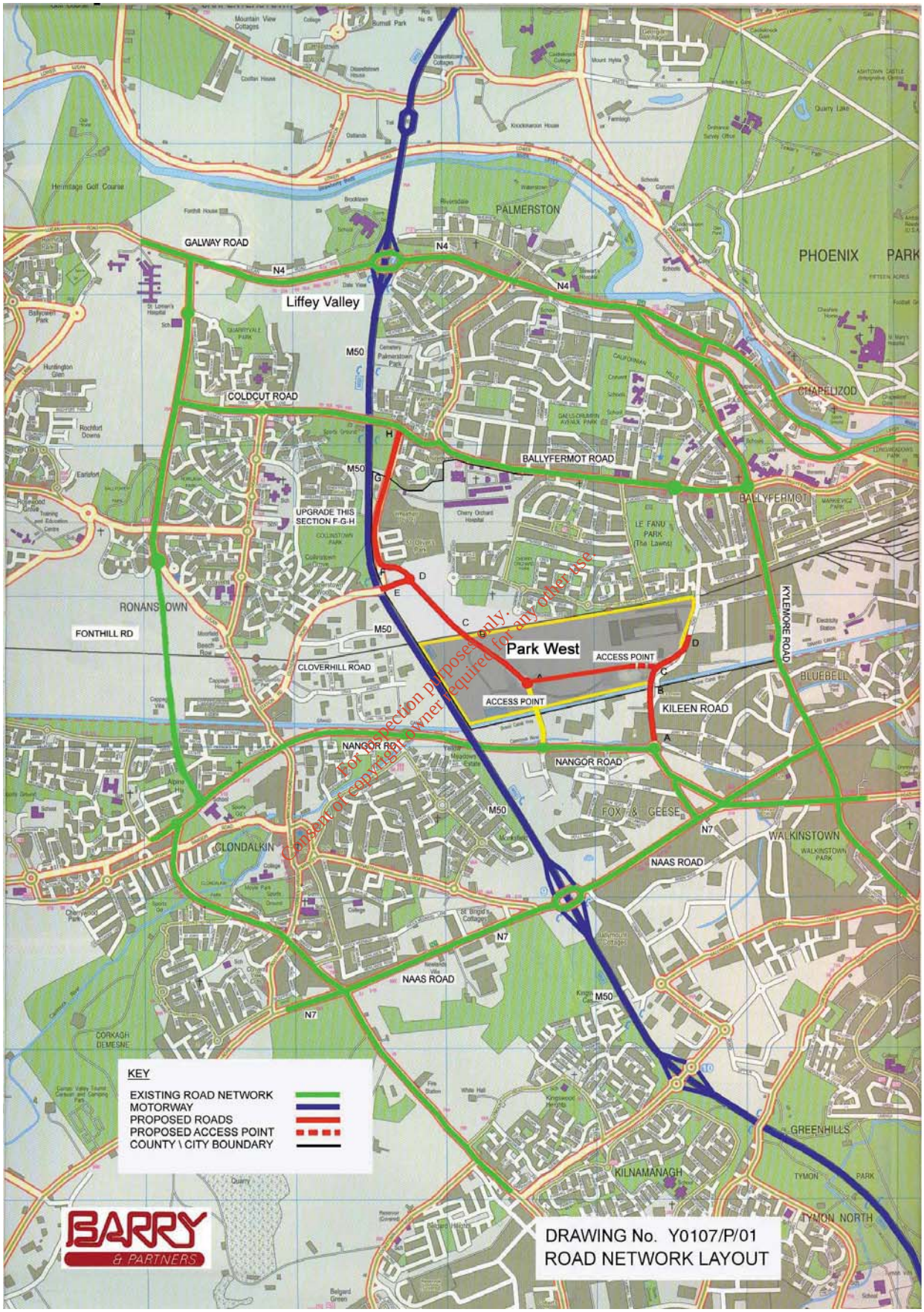
The site can only be accessed by entering the correct username on the Welcome Page.
The username is: **nangor.** This username may be changed at any time at the discretion of management, and users will be notified of any changes.

The *username* (nangor) is distinct from your *personal password.* The *username* is fixed, and is used simply to gain access to the site. Your *personal password* is a password that you create yourself when registering your details, and allows you to amend your records.

Note - it is entirely your own choice who you share a car with – for instance, women can simply choose to share with women only. There are detailed **Guidelines** within the site on how best to evaluate your intended carpooling partner.

Share the effort
Commute sensibly
Save money
Help the environment

7. Local Roads Map



8. The LUAS Line

The Dublin *LUAS* system, in operation since October 2004, is a state-of-the-art Light Rail Transit (LRT) system. LRT systems offer a unique set of benefits providing an attractive alternative to the use of private cars.

Park and ride facilities are provided at a number of stops including Red Cow stop on the Red Line adjacent to Park West. Bus and heavy-rail interchange facilities will also be provided at key locations.

Trams run every ten minutes from 5.30am to 00.30am, Monday to Friday. Services run from 6.30am to 00.30am on Saturdays and from 7.00am until 23.30pm on Sundays. Passengers must have a valid ticket before boarding the tram.

The nearest stop to Park West is Kylemore Road. A shuttle bus operates between Park West and McDonald's on the Kylemore Road. The fare is 1 euro each way payable to the driver.

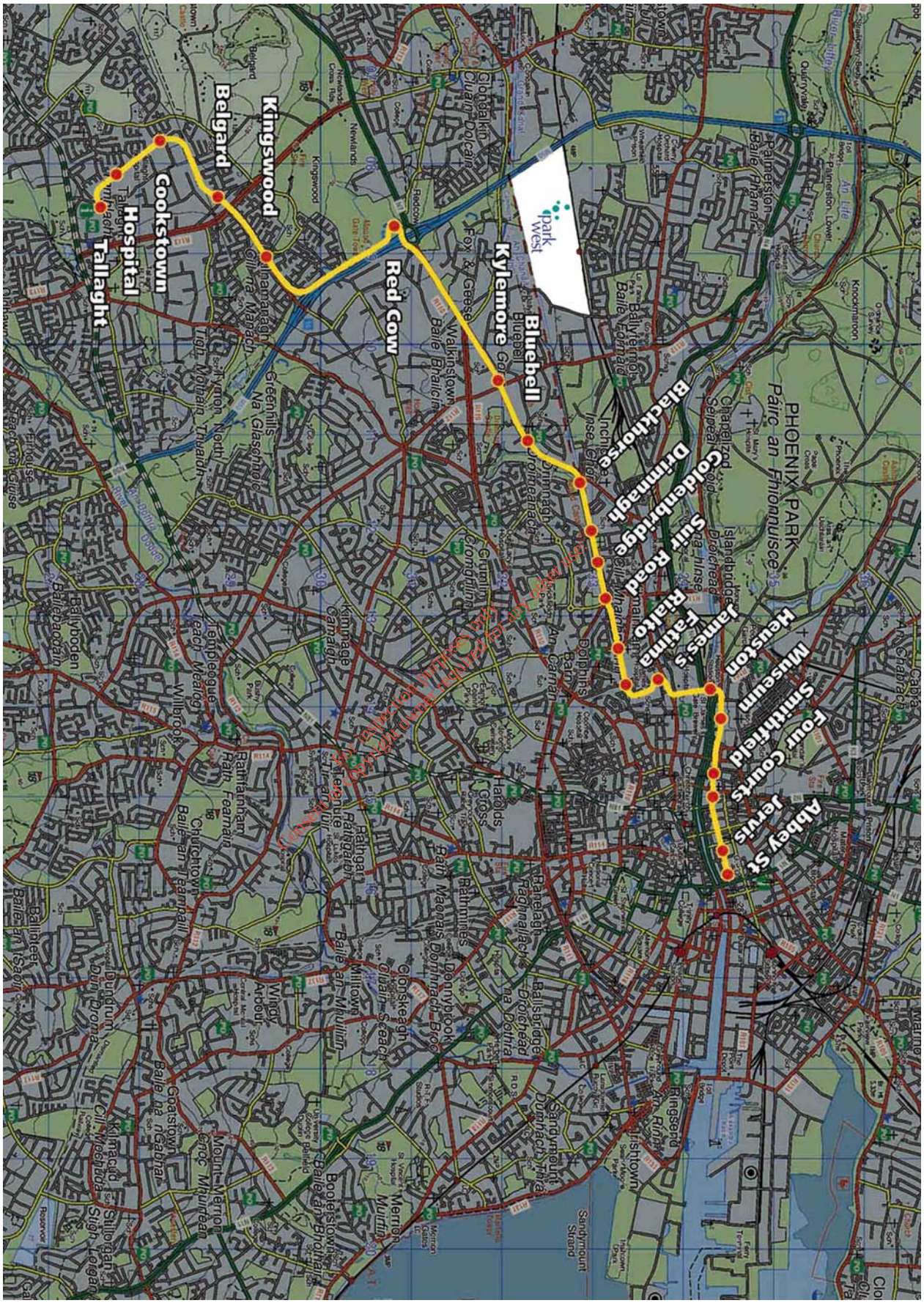
"Rush hour" journey times are expected to be:
Tallaght Square to Middle Abbey Street: 38 minutes
Tallaght to Connolly Station: 43 minutes
Sandyford Industrial Estate to Stephen's Green: 22 minutes

1 tram = 168 cars = 235 people

Stops along route are as follows (see map overleaf):

- Tallaght
- Tallaght Hospital
- Cookstown
- Belgard
- Kingswood
- Red Cow – near Park West
- Kylemore – near Park West
- Bluebell
- Blackhorse
- Drimnagh
- Goldenbridge
- Suir Road
- Rialto
- Fatima
- James's
- Heuston
- Museum
- Smithfield
- Four Courts
- Jervis
- Abbey Street
- Busaras
- Connolly

Luas Route Map



Annex D1-2 Details of Compressor Equipment

KAESER COMPRESSORS

Rotary Screw Compressors

ASK/ASK T Series

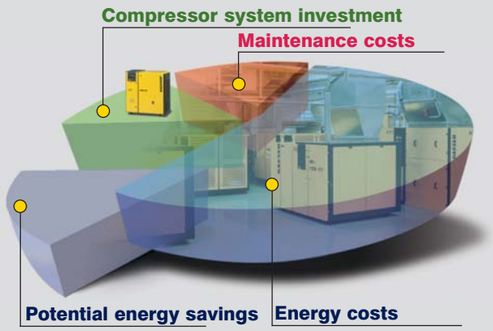
Air deliveries from 1.70 to 3.15 m³/min
Pressure 8/11/15 bar

KAESER COMPRESSORS

What do you expect from a compressor?

As a user, you expect maximum efficiency and reliability from your compressed air system.

This sounds simple, but these advantages are influenced by many different factors: Energy costs, for example, taken over the lifetime of a compressor, add up to a multiple of investment costs.



Efficient energy consumption therefore plays a vital role in the production of compressed air, as does reliability of the compressor. In many cases, a reliable compressed air supply is essential to guarantee maximum performance from valuable production installations.

Reliability also ensures a supply of constant quality compressed air that optimises efficiency of the air treatment equipment downstream from the compressor.

With regards to noise protection, it is always better to keep noise emissions to a minimum from the outset by using a quiet compressor rather than have to retro-fit sound protection measures later on.

Last but not least, a truly efficient compressor is simple to maintain.

ASK – The Powerhouse

KAESER's Solution: the ASK Series

The new ASK rotary screw compressors fulfil every customer requirement: they are highly energy efficient, quieter than quiet, require minimal maintenance, are extremely reliable and deliver the very best in air quality.

All of these advantages are aided through innovations in the compressor unit, controller and cooling system.

In short, the new ASK series of rotary screw compressors is a meticulously engineered and reliable product range built to KAESER's renowned high quality standards.

Eff1 motor

1. Inlet valve
2. Electric motor
3. V-belt drive with automatic belt tensioning
4. Airend
5. Separator with cartridge
6. Fluid cooler
7. Compressed-air aftercooler
8. SIGMA CONTROL or SIGMA CONTROL BASIC compressor controller
9. Refrigeration dryer (with ASK T)

Energy saving SIGMA PROFILE

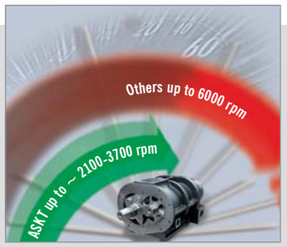
Each KAESER rotary screw compressor airend uses SIGMA PROFILE rotors, specially developed by KAESER, that require approximately 15 percent less energy than conventional rotors of the same air delivery capacity. The airends in ASK units use even further refined rotors.

SIGMA CONTROL compressor controller

The compressor controller is a robust PC-based industrial computer with a real-time operating system and update capability. 'Traffic light' style LEDs clearly indicate system operational status.

Longer service intervals reduce costs

An example of how carefully considered design leads to improved economy is demonstrated by the easy to clean / change filter mats that prevent contamination from entering the compressor unit. They not only enable extended service intervals but also help to considerably increase the thermal reserve of ASK units.



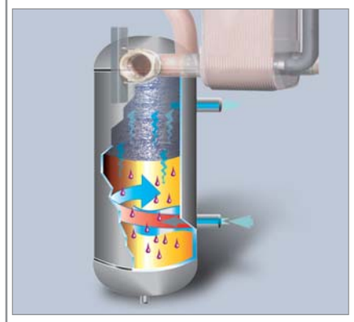
Quietly powerful

As the most efficient way to achieve a given drive power, KAESER uses large, low speed rotary screw airends.
This ensures that the specific power is always within the optimal range.
ASK units use a flexible V-belt drive system to precisely determine airend speed dependent upon the airend being used.
Further advantages of low airend speeds are that components are subjected to less wear and consequently last longer, and the associated lower noise emissions are of particular importance for compressors installed directly in work environments.

ASK T – The Modular Refrigeration Dryer Option

Permanently dry air

Space saving, energy efficient compressed air generation and treatment is possible by selecting the ASK **T** integrated refrigeration dryer module option. Easy to maintain, the dryer is contained in its own separate housing within the unit to prevent exposure to heat from the compressor package, considerably increasing operational reliability.
The refrigeration dryer also features an energy saving mode that can be selected via the SIGMA CONTROL BASIC and greatly reduces energy costs.



Stainless steel condensate separator

The compact stainless steel condensate separator ensures optimal condensate separation even with fluctuating flow volumes. The upstream contamination-proof heat exchanger also cools down the compressed air to make this possible.

Electronic condensate drain

The refrigeration dryer's electronically controlled ECO DRAIN operates according to the condensate level. This eliminates the pressure losses associated with conventional condensate drain systems and considerably enhances the reliability of the compressed air supply.

Eff1 motor

Available with SIGMA CONTROL BASIC

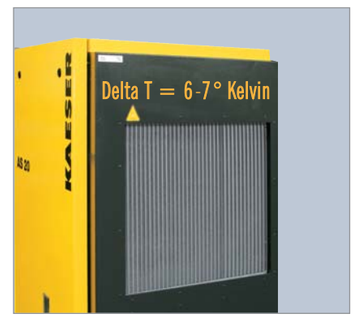
The user-friendly SIGMA CONTROL BASIC compressor controller offers Dual or Quadro control and monitors system pressure, compressed air temperature and direction of airend rotation. The operating hours counter can display both on-load and off-load hours. The maintenance interval indicator and system nominal pressure can be set according to operation.

Optional memory module

The optional memory module enables the SIGMA CONTROL BASIC to be connected to a master compressor controller: Simply plug in the module and the ASK compressor can be controlled, along with other compressors, via the KAESER SIGMA AIR MANAGER.

Cool air

The generously sized high-quality aluminium cooler has enough reserve for operation in high ambient temperatures. Directly taking in the ambient air for cooling prevents pre-warming and ensures excellent cooling. The air discharge temperature is only 6 to 7 K higher than the ambient temperature, which makes air treatment exceptionally efficient.

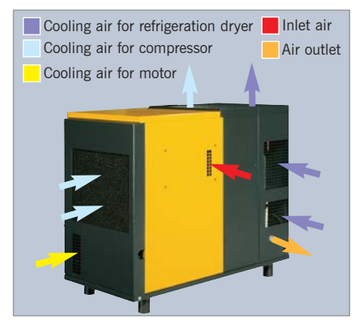


ASK and ASK T with SIGMA CONTROL

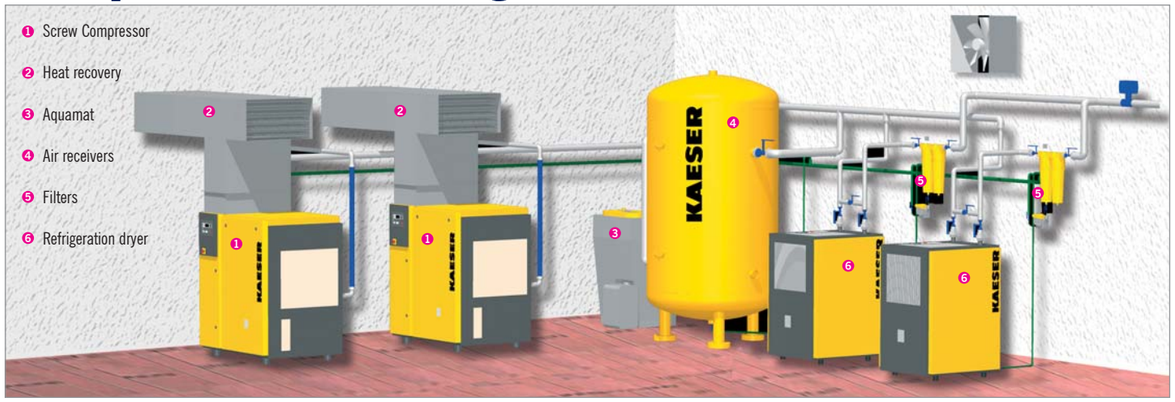
Based on robust PC architecture the SIGMA CONTROL offers the possibility of Dual, Quadro, Vario and continuous control. Clearly marked navigation and input keys on the user interface are used to move around within the menu options of the four-line alpha-numeric display. The SIGMA CONTROL automatically controls and monitors the compressor (and refrigeration dryer in 'T' versions).
The Profibus interface enables exchange of data and operational parameters and allows the SIGMA CONTROL to communicate with other air management systems such as the KAESER SIGMA AIR MANAGER . An optional modem can even send maintenance and alarm messages via SMS to relevant service locations.

Efficient cooling air flow system

Just like KAESER's larger units, ASK compressors also have separate air intakes for the air/fluid cooler, motor and compressed air, resulting in significant reserves even in high ambient temperatures. Taking in motor cooling air from the surroundings ensures reliable and effective motor cooling even under adverse conditions. The compression process is also enhanced by directly sucking in air for compression from the ambient surroundings. KAESER's modular design concept enables refrigeration dryers in 'T' units to be installed in their own separate housing and to have their own individual cooling system, significantly contributing to high efficiency and reliability.



Comprehensive design know-how



Equipment

Complete unit

Ready for operation, fully automatic, super-silenced, vibration damped, all panels powder coated.

Sound insulation

Lined with washable foam, antivibration mounts, double vibration damped.

Airend

Genuine KAESER rotary screw, single stage airend with SIGMA PROFILE and cooling fluid injection for optimised rotor cooling.

Electric motor

German made premium efficiency (EFF1) electric motor to IP55 and insulation class F for additional reserve.

V-belt drive with automatic belt tensioning

Durable V-belt drive with automatic tensioning device for extended belt life.

Fluid and air flow

Dry-air filter, pneumatic inlet and vent valves, cooling fluid reservoir with three-stage separator system, pressure release valve, minimum pressure/check valve, thermostatic valve and microfilter in cooling fluid system.

Cooling

Aluminium, air-cooled, combination cooler for compressed air and cooling fluid; axial fan fitted to motor drive shaft.

Electrical components

Ventilated control cabinet to IP 54, automatic star-delta starter; motor-overload protection; control transformer.

SIGMA CONTROL

Interfaces for data communication comprising RS 232 for a modem or printer, RS 485 for a slave compressor in base load sequencing mode and a Profibus DP interface for data networks. Prepared for Teleservice.

Professional planning

Every KAESER compressed air system illustrates KAESER's commitment to producing application-specific quality compressed air at the lowest possible cost and with unrivalled reliability. This standard is achieved with products of the highest quality and through decades of experience in design and construction of compressed air systems.

Only properly designed air systems can meet all the demands for air quality, availability and efficiency that are placed on a modern compressed air supply.

For outstanding efficiency and maximum savings, let KAESER design your air system.

Ergonomic control panel

Traffic-light style LEDs (green, yellow, red) show compressor operational status, plain text display, soft-keys with icons and duty display feature.

Prime functions

Fully automatic monitoring and regulation of airend discharge temperature; monitoring of motor current, direction of airend rotation, air filter, fluid filter and fluid separator cartridge; display of performance data, service intervals of primary components, operating hours, status data and event memory data. Selection of Dual, Quadro, Vario and Continuous control modes as required.

(For further information refer to SIGMA CONTROL brochure P-780)

ASK/ASK T Technical Specifications

Model	Rated motor power kW	Working pressure bar	FAD* at working pressure m³/min	Max. working pressure bar	Sound level**) dB(A)	Dimensions L x W x H	Weight kg
		7.5	2.60	8			
ASK 27	15	10	2.18	11	66	1130 x 780 x 1215	390
		13	1.70	15			
		7.5	3.15	8			
ASK 32	18.5	10	2.66	11	68	1130 x 780 x 1215	405
		13	2.05	15			
		7.5	3.50	8			
ASK 35	22	10	2.95	11	70	1130 x 780 x 1215	420
		13	2.35	15			

T - version with integrated refrigeration dryer (refrigerant R 134a)

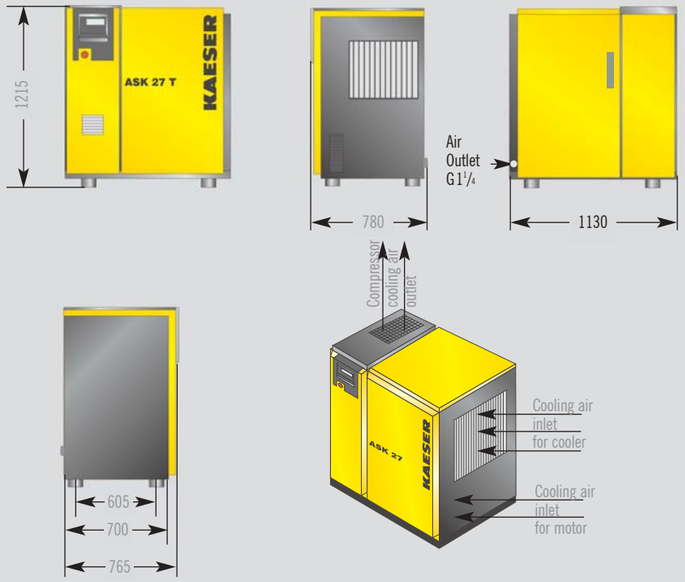
Model	Working pressure bar	FAD* at working pressure m³/min	Max. working pressure bar	Refrigeration dryer power consumption kW	Pressure dew point °C	Refrigerant	Sound level**) dB(A)	Dimensions L x W x H	Weight kg
	7.5	2.60	8						
ASK 27 T	10	2.18	11	0.68	3	R 134a	66	1480 x 780 x 1215	465
	13	1.70	15						
	7.5	3.15	8						
ASK 32 T	10	2.66	11	0.68	3	R 134a	68	1480 x 780 x 1215	480
	13	2.05	15						

* FAD to ISO 1217: 1996, Annex C; **)Sound level to PN8NTC 2.3 at 1m distance, free-field measurement

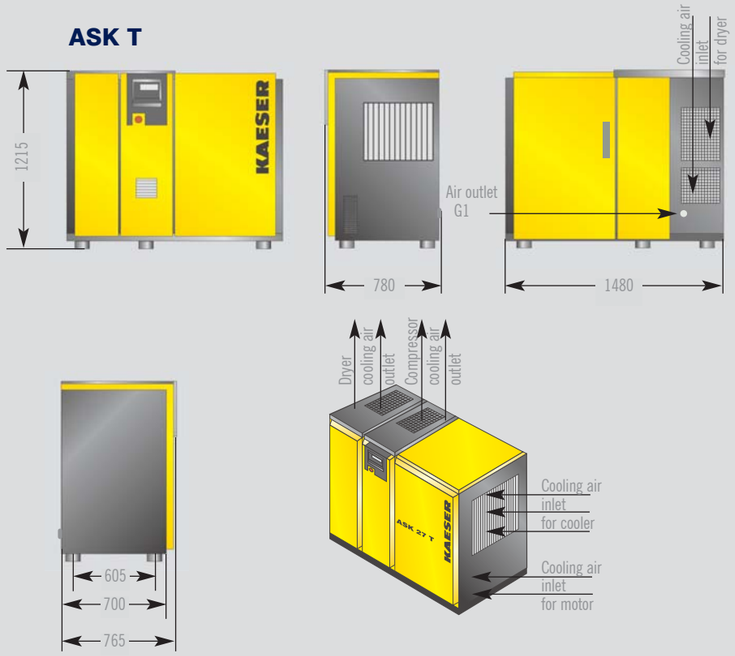
KAESER COMPRESSORS

Dimensions:

ASK



ASK T



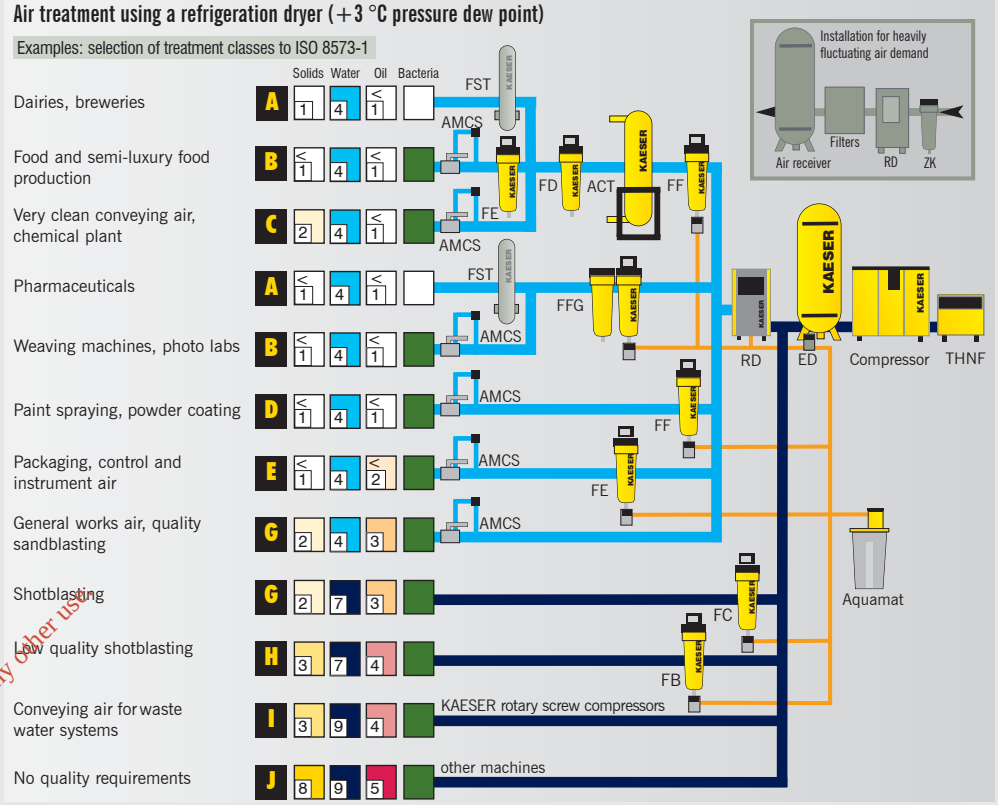
KAESER COMPRESSORS

Different fields of application need different grades of air treatment

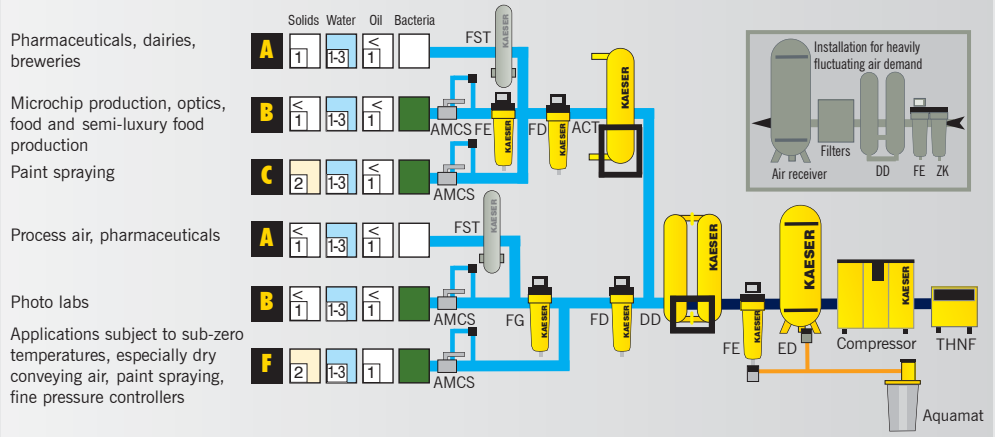
Choose the required grade of treatment according to your field of application:

Air treatment using a refrigeration dryer (+3 °C pressure dew point)

Examples: selection of treatment classes to ISO 8573-1



For air mains subject to sub-zero temperatures: treatment systems with desiccant dryers (pressure dew point to -70 °C)



A Oil vapour content ≤ 0.003 mg/m³, particle retention > 0.01 µm sterile, odourless and taste-free

B Oil vapour content ≤ 0.003 mg/m³, particle retention > 0.01 µm

C Oil vapour content ≤ 0.003 mg/m³, particle retention > 1 µm

D Aerosol oil≤ 0.001 mg/m³, particle retention > 0.01 µm

E Aerosol oil≤ 0.01 mg/m³, particle retention > 0.01 µm

F Aerosol oil≤ 0.01 mg/m³, particle retention > 1 µm

G Aerosol oil ≤ 1 mg/m³, particle retention > 1 µm

H Aerosol oil≤ 5 mg/m³, particle retention > 3 µm

I Aerosol oil ≤ 5 mg/m³, particle retention > 1 µm

J Untreated

Explanation:

THNF = bag filter
cleans dusty and highly contaminated intake air

ZK = centrifugal separator
removes condensate

ED = ECO Drain
electronic level-controlled condensate drain

FB = prefilter 3 µm
separates liquid droplets and solid particles >3 µm, oil content ≤5 mg/m³

FC = prefilter 1 µm
separates oil droplets and solid particles >1 µm, oil content ≤1 mg/m³

FD = particulate filter 1 µm
separates dust particles (attrition) >1 µm

FE = microfilter 0.01 ppm
separates aerosol oils and solid particles >0.01 µm, aerosol content ≤0.01 mg/m³

FF = microfilter 0.001 ppm
separates aerosol oils and solid particles >0.01 µm, oil content ≤0.001 mg/m³

FG = activated carbon filter
for adsorption of oil vapours, oil vapour content ≤0.003 mg/m³

FFG = combination filter
comprising FF and FG

RD = refrigeration dryer
pressure dew point to +3 °C

DD = desiccant dryer
for compressed air drying; DC series - heatless regeneration, pressure dew point to -70 °C; DW, DN, DTL and DTW series - heat regeneration, pressure dew point to -40 °C

ACT = activated carbon adsorber
for adsorption of oil vapours, oil vapour content ≤0.003 mg/m³

FST = sterile filter
for bacteria-free air

Aquamat = condensate treatment system

AMCS = air-main charging system

Contaminants:

+ solids -
+ water -
+ oil -
+ bacteria -

Degree of filtration:

ISO 8573-1 Class	Solid particles: Max. no. of particles per m³ with size d (µm) 0.1<d≤0.5	0.5<d≤1.0	1.0<d≤5.0	Solid particles: µm	Solid particles: mg/m³	Humidity: Pressure dew point (x=liquid water in mg/m³)	Oil concentration: mg/m³
0	as specified by user						
1	100	1	0	–	–	≤ -70 °C	≤ 0.01
2	100000	1000	10	–	–	≤ -40 °C	≤ 0.1
3	–	10000	500	–	–	≤ -20 °C	≤ 1.0
4	–	–	1000	–	–	≤ +3 °C	≤ 5.0
5	–	–	20000	–	–	≤ +7 °C	–
6		–		≤ 5	≤ 5	≤ +10 °C	–
7		–		≤ 40	≤ 10	x ≤ 0.5	–
8		–		–	–	0.5 < x ≤ 5.0	–
9		–		–	–	5.0 < x ≤ 10.0	–

LGA InterCert Certified QM-System ISO 9001:2000
LGA InterCert Certified EM-System ISO 14001

KAESER KOMPRESSOREN GmbH

P.O. Box 2143 – 96410 Coburg – GERMANY – Tel: +49 9561 640-0 – Fax: +49 9561 640130
www.kaeser.com – e-mail: productinfo@kaeser.com

P-651/23 ED.2/05 Specifications are subject to change without notice

Air Receivers

90 to 10,000 litres

KAESER COMPRESSORS

Air receivers are required in almost all compressed air systems to act as buffers and air storage vessels. They also have a most important function in initial air-drying. KAESER has the right vessel for every application.

- Manufactured and inspection in accordance with pressure equipment directive 97/23 EC
- ASME vessels and vessels with Gost approval available on request. Other approval requirements also available

Standard range

- Up to 3,000 litres, zinc-coated inside and out
- Hot zinc dipped to Standard ISO 1461 for excellent corrosion resistance
- From 4,000 litres, available with primed or painted exterior
- Vertical and horizontal arrangements available
- Tapered thread connections for sure sealing

- All sizes from 90 to 10,000 litre, suitable for 11 or 16 bar pressure, 500 and 1,000 litre models suitable for 45 bar and 2,000 litre models suitable for 50 bar

Approval

- Standard pressure vessel approval to 87/404 EEC for pressure/volume products up to 10,000

Accessories

- Set of standard fittings, including: ball valve, pressure relief valve, pressure gauge, drain tap, gaskets and minor items
- Automatic condensate drain set, including an electronic level-sensing ECO DRAIN with fittings and bracket

Volume	Max. permissible pressure (bar)				Surface finish			Arrangement		Specifications, zinc dipped version						Weight
					Zinc dipped	Primed	Painted	Vert.	Horiz.	Vertical, 11 bar			Horizontal, 11 bar			
										Height	Ø	Connections	Length	Ø	Connections	
Litres	11	16	45	50						mm	mm		mm	mm		ca. kg
90	o	-	-	-	•	-	-	o	-	1160	350	2x G ½	-	-	-	37
150	o	o	-	-	•	-	-	o	o	1190	450	2x G 3/4 rear	1040	450	2x G 2	55
250	o	o	-	-	•	-	-	o	o	1580	500	2x G 3/4 rear	1430	500	2x G 2	75
350	o	o	-	-	•	-	-	o	o	1810	550	2x G 1 rear	1640	550	2x G 2	80
500	o -	o -	- o	- -	• •	- -	- -	o o	o -	1925	600	2x G 1 rear	1780	600	2x G 2	110
900	o	-	-	-	•	-	-	o	-	2210	795	2x G 2, 2x G 1½	-	-	-	215
1000	o -	o -	- o	-	• •	-	-	o o	o -	2265	800	2x G 1½, 2x G 2	2150	800	1x G 2, 1x G ½	215
2000	o -	o -	- -	- o	• •	- -	- -	o o	o -	2375	1150	5x G 2½	2180	1150	2x G 2	420
3000	o	o	-	-	•	-	-	o	o	2710	1250	5x G 2½	2610	1250	2x G 2½	605
4000	o	o	-	-	o	o	o	o	o	3215	1400	4x DN 100	3290	1300	2x G 2½	920
5000	o	o	-	-	o	o	o	o	o	3570	1400	5x DN 100	3470	1400	4x DN 100	950
6000	o	o	-	-	o	o	o	o	o	3500	1600	5x DN 101	3400	1600	4x DN 100	1140
8000	o	o	-	-	o	o	o	o	o	4400	1600	1x DN 100, 4x DN 200	4400	1600	4x DN 200	1680
10000	o	o	-	-	o	o	o	o	o	5415	1600	1x DN 100, 4x DN 200	5400	1600	4x DN 200	2100

• Standard version
o Optional version

KAESER KOMPRESSOREN GmbH
PO Box 2143 - 96410 Coburg - GERMANY — Telephone +49 9561 6400 - Fax +49 9561 640130
http://www.kaeser.com - email: productinfo@kaeser.com

P-775ED/03 Specifications are subject to change without notice

KAESER COMPRESSORS

Air Filters

Filters

0.58 to 248 m³/min
up to 16 bar

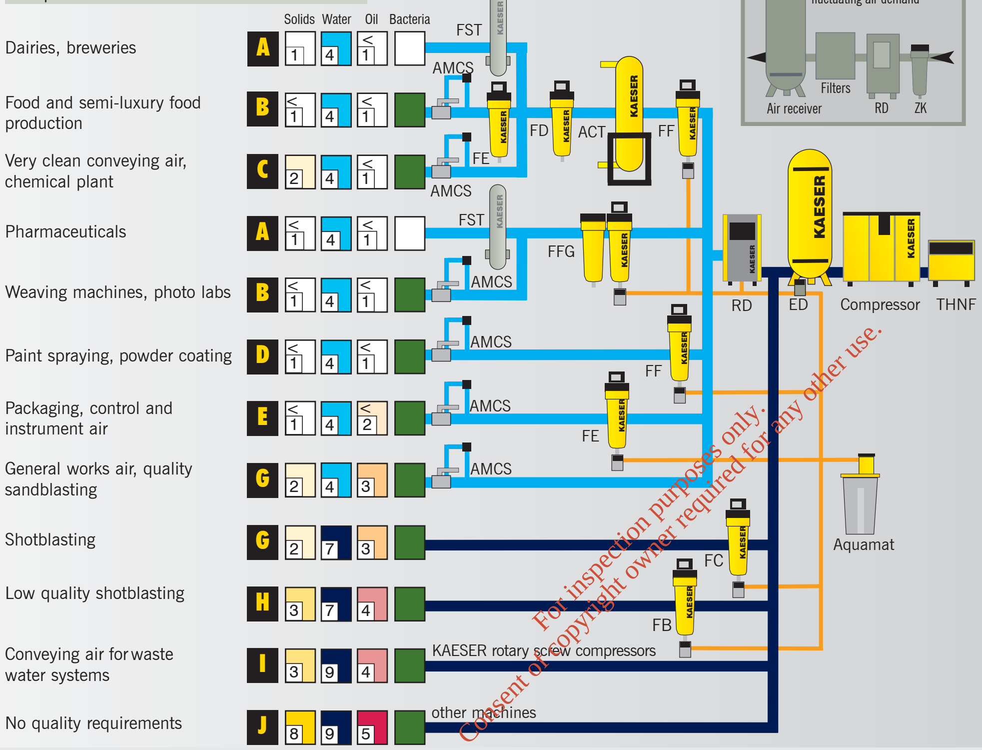
KAESER COMPRESSORS

Why is it necessary to treat compressed air?

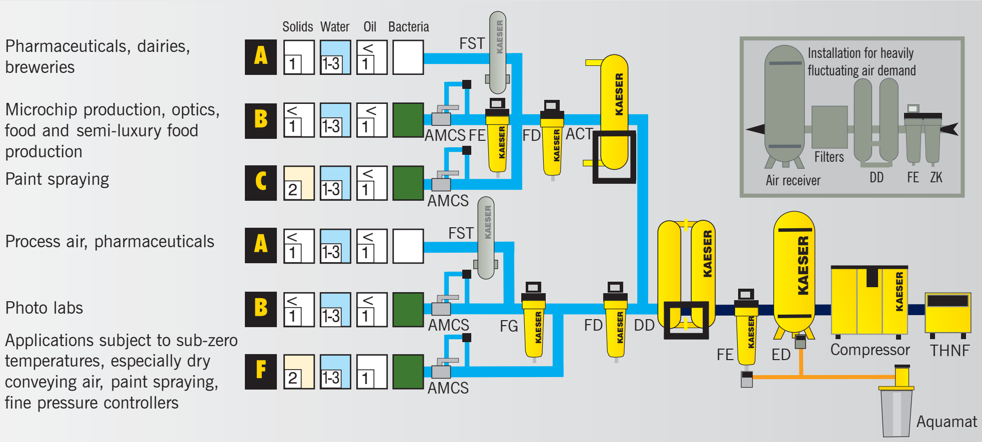
On average, a compressor sucks in up to 190 million particles of dirt, hydrocarbons, viruses and bacteria with every cubic metre of atmospheric air. The compressor itself can only remove the larger dirt particles and the majority of the contaminants remain in the compressed air. This means that for most applications careful treatment of the air is necessary:

Choose the required grade of treatment according to your field of application:

Air treatment using a refrigeration dryer (+3 °C pressure dew point)



For air mains subject to sub-zero temperatures: treatment systems with desiccant dryers (pressure dew point to -70 °C)



Explanation:

THNF = **bag filter**
cleans dusty and highly contaminated intake air

ZK = **centrifugal separator**
removes condensate

ED = **ECO Drain**
electronic level-controlled condensate drain

FB = **prefilter** 3 µm
separates liquid droplets and solid particles > 3 µm, oil content ≤ 5 mg/m³

FC = **prefilter** 1 µm
separates oil droplets and solid particles > 1 µm, oil content ≤ 1 mg/m³

FD = **particulate filter** 1 µm
separates dust particles (attrition) > 1 µm

FE = **microfilter** 0.01 ppm
separates aerosol oils and solid particles > 0.01 µm, aerosol content ≤ 0.01 mg/m³

FF = **microfilter** 0.001 ppm
separates aerosol oils and solid particles > 0.01 µm, oil content ≤ 0.001 mg/m³

FG = **activated carbon filter**
for adsorption of oil vapours, oil vapour content ≤ 0.003 mg/m³

FFG = **combination filter**
comprising FF and FG

RD = **refrigeration dryer**
pressure dew point to +3 °C

DD = **desiccant dryer**
for compressed air drying; DC series - heatless regeneration, pressure dew point to -70 °C; DW, DN, DTL and DTW series - heat regeneration, pressure dew point to -40 °C

ACT = **activated carbon adsorber**
for adsorption of oil vapours, oil vapour content ≤ 0.003 mg/m³

FST = **sterile filter**
for bacteria-free air

Aquamat = **condensate treatment system**

AMCS = **air-main charging system**

Contaminants:

+ solids -
+ water -
+ oil -
+ bacteria -

Degree of filtration:

ISO 8573-1 Class	Solid particles: Max. no. of particles per m³ with size d (µm) ≤ 0.1	0.1 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	µm	mg/m³	Humidity: Pressure dew point (x = liquid water in mg/m³)	Oil concentration: mg/m³
0	as specified by user							
1	–	100	1	0	–	–	≤ -70 °C	≤ 0.01
2	–	100000	1000	10	–	–	≤ -40 °C	≤ 0.1
3	–	–	10000	500	–	–	≤ -20 °C	≤ 1.0
4	–	–	–	1000	–	–	≤ +3 °C	≤ 5.0
5	–	–	–	20000	–	–	≤ +7 °C	–
6			–		≤ 5	≤ 5	≤ +10 °C	–
7			–		≤ 40	≤ 10	x ≤ 0.5	–
8			–		–	–	0.5 < x ≤ 5.0	–
9			–		–	–	5.0 < x ≤ 10.0	–

A Aerosol oil ≤ 0.003 mg/m³, particle retention > 0.01 µm
sterile, odourless and taste-free

B Oil vapour content ≤ 0.003 mg/m³, particle retention > 0.01 µm

C Oil vapour content ≤ 0.003 mg/m³, particle retention > 1 µm

D Aerosol oil ≤ 0.001 mg/m³, particle retention > 0.01 µm

E Aerosol oil ≤ 0.01 mg/m³, particle retention > 0.01 µm

F Aerosol oil ≤ 0.01 mg/m³, particle retention > 1 µm

G Aerosol oil ≤ 1 mg/m³, particle retention > 1 µm

H Aerosol oil ≤ 5 mg/m³, particle retention > 3 µm

I Aerosol oil ≤ 5 mg/m³, particle retention > 1 µm

J Untreated

Clean, quality compressed air maximises air-tool service life, ensures that pneumatic machinery and control systems operate at the peak of their performance and keeps pipes & valves free from contaminants. It therefore not only reduces service, maintenance and repair costs, but can also reduce procurement costs.

KAESER COMPRESSORS

Condensate Treatment

AQUAMAT Series

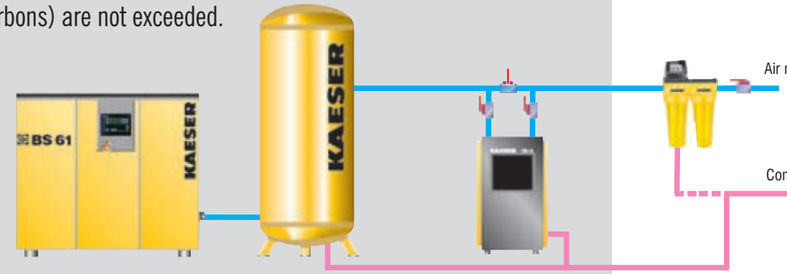
for compressors of
1 to 90 m³/min capacity

KAESER COMPRESSORS

AQUAMAT - saves money

Why treat condensate?

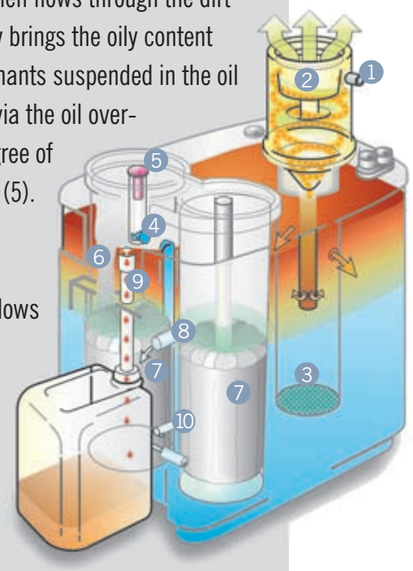
The condensate generated as a by-product of all compressors is contaminated with dirt and oil to a degree depending on ambient and operational conditions. The pollutants and mineral oils in condensate are extremely difficult to decompose biologically, they negatively affect waste water treatment in sewage plants and endanger the environment. Contaminated water must be treated under generally accepted technical control procedures to ensure the official limits for contaminants are not exceeded. This function is fulfilled by the economic treatment system AQUAMAT from KAESER, which reliably ensures that regulation limits for contaminants (20 mg/litre for example, in the case of hydrocarbons) are not exceeded.



Reliable drainage at all condensate collecting points of the air system must be guaranteed.
The best way of ensuring this is to use electronically controlled condensate drains

Function

The condensate is fed under pressure directly to the inlet (1) and expansion/silencing chamber (2). Condensate is separated out of the air, which is allowed to escape. The condensate then flows through the dirt catcher (3) into the settling tank where gravity brings the oily content to the surface. The separated oil and contaminants suspended in the oil float to the surface of the fluid and then flow via the oil overflow pipe (4) through a prefilter (6) whose degree of contamination is registered by the level sensor (5). The condensate then flows into the adsorption filter (7) where the remaining oil content is removed and the now clean water flows out of the unit via the outflow pipe (8). The separated oil flows into a special collecting canister via the overflow pipe (9). Samples of the water quality can be drawn from a test point (10).



1. Condensate inlet
2. Expansion/silencing chamber
3. Dirt catcher
4. Oil overflow pipe
5. Level sensor
6. Prefilter
7. Adsorption filter
8. Water outflow pipe
9. Oil overflow, height adjustable
10. Sampling point

Cost-saving treatment

With the AQUAMAT, the compressor user can easily carry out his own treatment and thereby greatly reduce the overall cost of treating hazardous waste. Treating condensate with the **AQUAMAT system achieves cost-savings of around 90%** compared with disposal of the condensate by a specialised company.
These inexpensive separators are quickly amortised.

Tested and certified condensate treatment

The Institute of Building Techniques in Berlin has tested and certified the AQUAMAT as meeting the most modern standards of treatment plant.
This means utmost reliability and confidence for the user. The AQUAMAT not only reduces waste treatment costs but also contributes to the protection of the environment.

Test set

With this simple set, the quality of the cleaned water can be tested at any time. The set is conveniently stored in the unit cover.

Automatic maintenance indicator

The level sensor clearly indicates the degree of filter contamination so that timely preventive maintenance can be initiated to keep the unit in top functioning condition and save further costs.

Quicker filter changing

The large maintenance cover allows rapid and easy filter changing.

Multiple inlets

Standard equipment allows inlet of up to four condensate lines (from AQUAMAT 2 upwards). Unused connections are blocked off by plastic plugs, which are included in the scope of delivery.

KAESER COMPRESSORS

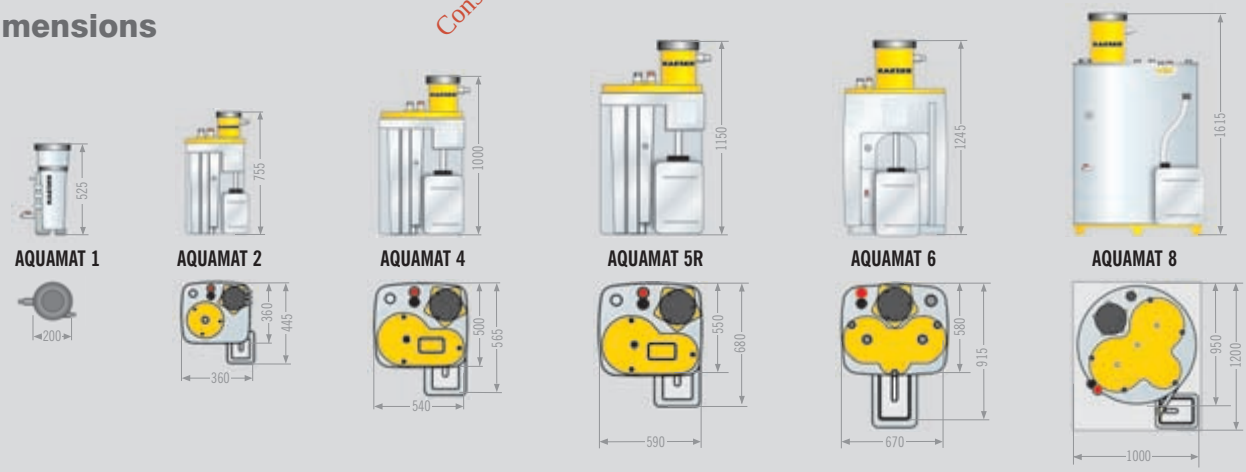
Technical Specification

AQUAMAT series, condensate treatment units. In choosing the right AQUAMAT treatment unit, the factors of compressor type and oil used must be considered.		 **AQUAMAT 1**	 **AQUAMAT 2**	 **AQUAMAT 4**	 **AQUAMAT 5R**	 **AQUAMAT 6**	 **AQUAMAT 8**
Suitable for max. compressor capacities (m^3/min) for climate zone [1]		1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
• Screw and rotary compressors with oil injection							
SIGMA FLUID PLUS, turbine oil		2.5 / **1.5** / 1	4.5 / **4** / 2.5	10 / **8.5** / 5,5	21 / **16.5** / 10.5	45 / **33** / 23	120 / **105** / 60
SIGMA FLUID MOL, VCL oils		1.5 / 1 / 0.5	3 / 2.5 / 1.5	7 / 5.5 / 3.5	14 / 11 / 7	30 / 22 / 15	80 / 70 / 40
VDL oil		2 / 1.3 / 0,7	4 / 3.5 / 2	9 / 7 / 4.5	18 / 14.5 / 9	40 / 30 / 20	100 / 90 / 50
Synthetic oils (not ester or polyglycol oils), climate zone 2		0.3-1	1.2-2.5	2.3-5.5	5.5-11	11-22	25-70
• Reciprocating single and two-stage compressors							
Turbine oil		1.2 / 1 / 0.4	2.4 / 2 / 1	5.6 / 4.4 / 2.8	11.2 / 8.8 / 5.6	24 / 22 / 12	80 / 70 / 40
VDL or synthetic oil,	climate zone 2	0.4-0.7	0.7-1.4	1.4-3.3	3.3-6.5	6.5-16.8	17-52
Container capacity	l	10	55	180	200	335	720
Filter capacity	l	1 x 2 / 1 x 3	1x2 / 1x3	1 x 4.5 / 1 x 8	1 x 9 / 1 x 17	1 x 9 / 2 x 17	1 x 30 / 2 x 45
Condensate inlet connections		2 x G1/2	3 x G1/2 / 1 x G1	3 x G1/2 / 1 x G1	3 x G1/2 / 1 x G1	3 x G1/2 / 1 x G1	3 x G1/2 / 1 x G1
Water outlet (hose)		DN 10	DN 13	DN 25	DN 25	DN 30	DN 30
Oil outlet DN		—	DN 20	DN 32	DN 32	DN 30	DN 30
Weight empty	kg	4	10	24	30	40	90
Width	mm	200	360	540	590	670	1000
Depth	mm	200	445	565	680	915	1200
Height	mm	525	755	1000	1150	1245	1615
Thermostatic heating							
Capacity	kW	-	0.4	1	1	1.4	2 x 1.4
Weight	kg	-	0.9	2.3	2.3	3	3
Power requirement	V	230 V - 50-60 Hz - 1 Ph					

Attention! Fresh-oil lubricated compressors and multi-stage reciprocating compressors have a strong emulsifying tendency . - Please inform KAESER about the technical specification of your compressors to obtain an individual AQUAMAT recommendation.

[1] Climate zones: **1 = dry/cool** (Northern Europe, Canada, Northern USA, Central Asia), **2 = moderate** (Central and Southern Europe, Some parts of South America, North Africa), **3 = moist** (South-East Asian coastal areas, Central America, Amazon and Congo regions, equatorial ocean regions)

Dimensions



LGA Zertifikat QM System ISO 9001

KAESER KOMPRESSOREN GmbH
PO Box 2143 – 96410 Coburg – GERMANY – Telephone +49 9561 6400 – Fax +49 9561 640130
http://www.kaeser.com – email: productinfo@kaeser.com

P-740ED.8/03 Specifications are subject to change without notice

Facility Operation

Attachment D2

D2 FACILITY OPERATION

D2.1 INTRODUCTION

The facility will be used to process Waste Electronic and Electrical Equipment (WEEE) sourced from within Ireland. The process will involve the manual and mechanical dismantling of WEEE, with subsequent recovery of the valuable scrap components.

The recovered components will include various segregated grades of metals (e.g. ferrous, aluminium, general non-ferrous and precious metals), and plastics. These materials will be sold to licensed industrial facilities (e.g. foundries and smelters) as raw materials.

The majority of the potentially hazardous components such as batteries, cathode ray tubes (CRT), mercury switches, oils etc, will be manually removed from the items prior to processing of the WEEE. Smaller internal items (e.g. small capacitors) will also be removed at picking stations located at several stages within the process.

WEEE containing hazardous items such as asbestos, Polychlorinated Bi-phenyls (PCBS) or Ozone Depleting Substances (ODS) will not be processed on the Site, but will be held in quarantine prior to transfer to an appropriately licensed disposal contractor (details in *Attachment H4*).

D2.2 OPERATING CONCEPT

The process involves the dismantling of WEEE into its component parts using a variety of physical processes, including crushing, grinding, sorting and sieving. The operation can be run as a largely continuous process, (depending on the volume of WEEE input), with the individual equipment items linked by conveyor belts. The component items are segregated into hoppers/bins at a number of locations throughout the process, (some as final product, and some for further processing).

The WEEE will be pre-sorted to achieve optimum value from the component materials. Where possible, the requirement for sorting will be included as a condition of contract with the waste collection contractors and other WEEE producers who will be contracted to use the Site. Some small batches of WEEE are likely to arrive un-sorted at the Site, and these will be sorted by the Operator.

The multi-stage size reduction process can be adjusted to the specific requirements of the material being processed (e.g. for larger or smaller units, soft or hard materials etc). This helps to optimize the required energy use and conserves the lifespan of the crushing equipment.

After each crushing, the compacted and heavy density components (mostly metals) are separated in the sorting plant and are further processed into their individual components. This helps improve the product quality and minimizes the risk of plastic caking and carbonization. Wire pieces are also eliminated at this stage.

In the individual separation stages comprise a variety of pneumatic (i.e. air blown), magnetic and electrostatic processes, each of which can be individually adjusted to in order to select the desired product stream and maximize product quality. The process can be divided into four discreet Modules, each with their own specialised equipment and purpose, as follows:

- Module 1 - Goods Receipt, Sorting and Manual Dismantling (including CRT Removal);
- Module 2 – Preliminary Breakdown;
- Module 3 – Mechanical Separation; and
- Module 4 – Fine Separation.

Drawing 03 presents the location of each Module. Detailed descriptions of each Module are provided below and should be read in conjunction with the associated process flow diagrams and plans for each Module, *Drawings 12 to 19*. Additional engineering details, including the operational manuals for key process and abatement equipment, are included in either *Annex F1-1* or separately as commercially sensitive data. A list of the equipment numbers used in the drawings is provided in *Annex D2-1*.

Module 1 Goods Receipt, Sorting and Manual Dismantling

Module 1 involves the separation of the WEEE as it arrives onto the Site into several categories and the processing of CRTs. The sorted WEEE is then introduced into Module 2.

There are several broad categories for the initial sorting process:

- Small WEEE (e.g. toaster) that can go straight into Module 2, at point H2.1;
- Large WEEE (e.g. photocopier) for manual dismantling prior to processing in Module 2, this is undertaken in the *Waste Intake and Sorting Area*;
- WEEE containing Cathode Ray Tubes (CRT) - which is placed in the *CRT Storage Area* prior to being processed through a purpose-designed separation unit;
- WEEE containing oil -which is emptied and cleaned at the *Oil Separation Station* prior to processing in Module 2;
- CFC containing equipment - which is stored in the *Fridge and Freezer Area* prior to being sent to an appropriate treatment facility;
- Florescent light bulbs - which are stored in specific coffins in the *Hazardous Waste Storage* area; and

- Items which do not meet the Site's Waste Acceptance Criteria, such as those potentially containing PCB, ODS, radioactive sources or asbestos. These will be stored in the dedicated *Hazardous Waste Storage* area.

The location of each of the specified storage areas is shown on *Drawing 04.*

Separation Process

Module 1 involves a high level of visual inspection and manual handling. Large pieces of WEEE such as washing machines, photocopiers etc. are manually dismantled and cables, switches, motors and other constituent parts are removed and are stored as segregated products. The residual WEEE is sent to Module 2.

Fridges and freezers (containing ODS) are held onsite, prior to being removed by a licensed haulier to an appropriately licensed processing facility, details of which are contained in *Attachment H.4 and H.3.* No processing of ODS containing equipment will be undertaken on the Site.

Florescent light bulbs are held onsite until sufficient numbers have been collected. These will either be sent to a licensed facility for treatment, or in the future, may be processed in an onsite, mobile treatment plant. Details of the mobile treatment plant are outlined below.

Potential Florescent Light Bulb Recycling Process

The Operator is considering the future use of a mobile unit for the onsite processing of fluorescent tubes. This would not be introduced onto the Site without the submission of additional details regarding the unit's potential emissions, as well as the receipt of the Agency's written approval of the process.

The mobile plant is housed in a 40ft articulated truck that would be called to the Site as required. The fluorescent tubes are fed into a reception system of at the rear of the truck, where they are counted by sensors and their measurements are imported into the controller system. The metal caps are separated from the glass body (at rated break points), in a dry mechanical process. The lamp glass is broken and the fluorescent powder is removed under vacuum. The caps are thermally separated from the lamp body and the tubes are blown clean. If necessary, this technology can be complemented by optical detection of the fluorescent powders through image processing. Using this method, it is possible to determine the manufacturer of each individual lamp and to extract the different grades of fluorescent powders separately for later reuse in new lamps. These powders are stored in air-tight bags for subsequent transfer to the appropriate manufacturers.

After separation of the materials, the main components are heated in order to vaporise any residual amounts of mercury. The secondary products (e.g. glass dusts) also undergo similar heat treatment. The vaporized mercury is cooled down and then enters an activated carbon filter where it is absorbed and will

subsequently be disposed as a hazardous waste. The entire process is maintained under vacuum to ensure that potentially hazardous substances are not released to the environment.

All components and operating conditions would be supervised by a Programmable Logic Controller (PLC) which ensures that any deviation from the specified operating parameters causes the unit to shut down. The unit can only be restarted after non-conformance situation has been addressed. During a shut down, all air exhausts are immediately and automatically closed to ensure that any contaminated gases are contained.

Cathode Ray Tube (CRT) Separation

The term 'CRT' refers to the glass screens (and associated internal glass components) which are found in computer monitors and TV screens. Units ranging in size from 14 – 32 inches (screen size) can be processed onsite in a purpose-designed unit, at a rate of approximately 45 units/hour. A summary is provided as follows and the Design and Operating Manual is included separately as commercially sensitive data.

CRT's are comprised of two different types of glass. One type of glass is used to make the front panel, or screen of the CRT, and is characterised by high levels of barium oxide. A different type of glass is used to make the funnel and neck of the CRT (which are internal to the WEEE item) and characteristically contains high levels of lead oxide.

Separation of the two types of glass allows for greater recycling of the glass and a cleaner glass streams (i.e. not containing lead) can be provided. The CRT separator is designed to disassemble the CRT into the two main glass parts:

- Funnel glass; and
- Panel glass.

Additionally, the "electric gun discharge" (a metal component in the CRT) is removed as a separate stream for further processing. Other manual separation before, and after the removal of the CRT, allows the separate recovery of additional components for recycling, including:

- Plastic;
- Metal; and
- Wiring/caballing.

Other residual waste is sent to Module 2.

The units are placed face down on a conveyor belt (H1.1) which passes a number of manual 'picking' stations where, the plastic surround, high tension unit, back cover and any metal/plastic strips are removed and any damaged tubes are separated out.

Once the tubes are ready to be fed into the cutting station, the conveyor can act as a short term storage area prior to their entry into the separation unit. The units pass point F1.1, which is the final inspection point prior to proceeding onto the inlet conveyor H1.2. The units are centred by fork arms on the inlet conveyor before entering the measurement system F1.2, which checks the height of each unit and aligns it appropriately before entering the cutting station Z1.1.

The CRT is cut into two pieces within a sealed cutting station. The unit is designed to prevent the breakage/shattering of the CRT glass during the cutting process. The process is completely automated and all air emissions are passed through a cyclone and filter system.

Once cut, the panel glass proceeds out of the unit on the outlet conveyor (H1.3), to the Hoover station (F1.3). Here, the electronic gun discharge unit is removed from the funnel glass, which is then collected in a designated container (*waste stream 1.1*). At the Hoover Station, the panel glass is manually cleaned of residual metal, dust and rare earth powders.

Potential Future Crushing Process for CRT Glass

There is the potential to further process the CRT funnel glass onsite through an "Integrated Crusher and Cleaning Drum for Funnel Glass". This equipment was not onsite at the time of the Licence Application. The equipment, if purchased, will not be commissioned without the prior written approval of the Agency. A brief summary is provided as follows and the Operations Manual is submitted separately as commercially sensitive information.

The apparatus crushes funnel glass parts to smaller fragments - grain size less than 50 mm. Minimal dust is generated, due to the specially designed crushing method. Glass fragments are cycled on a rotating drum where foreign particles, (e.g. graphite, labels etc) are separated from glass grains. All air emissions from the operation are exhausted under vacuum and are treated in a cyclone and filter, prior to discharge back inside the building. The location of this proposed equipment is highlighted in *Drawing 04.*

Emission Control

Extracted air from the CRT cutting station passes through an ALSA-PH-05 cyclone (X1.1) and filtration system (X1.2). Air extracted from the vacuum at the panel glass station also passes through a similar ALSA-PH-03 filtration system (X1.3). The filter system media is made up of tubes of Polyethylene material. The air flow rate through the abatement system is estimated at 2,000m^3/hr at 6,000 Pascal. The particulate removal design efficiency of the abatement system is >99.99% (at a particle size of >5 microns). Air from the abatement system is discharged to the atmosphere through a stack on the eastern side of the roof. The emission point is considered to be a minor emission (A2-1).

Approximately 5 – 10 ml of water (per unit cut) is sprayed onto the cutting blade during the separation process. This water is vaporised and collected within the powder collection system or is discharged to air as water vapour.

Waste Arising

Of the WEEE that is processed on Site (i.e. not including fridges or freezers), approximately 30% of the material is recovered/separated out in Module 1. The separated fractions include glass, deflection and focusing coils, metal, capacitors, plastic, toner, cables, batteries and oils. A detailed breakdown of the individual waste streams arising from Module 1 is provided in *Attachment H.4*.

Module 2- Preliminary Breakdown

Process Description

Module 2 accepts the following waste streams:

- Large items of WEEE from Module 1 that has been manually dismantled;
- WEEE that has been cleaned of oil/water;
- Small items of WEEE; and
- Residual WEEE from the CRT machine.

This material is placed on an in-ground/sunken conveyer (H2.1) which delivers the WEEE through a vibrating chute (H2.2) to the Cross Flow Shredder, also referred to as the 'QZ Machine' (Z2.1). The Design and Operating Manual for this machine has been submitted separately as commercially sensitive information.

The QZ machine is a purpose designed unit which uses rotating chains to break-up the WEEE. The unit is enclosed in an individual sound proof room. Sound proofing provides a 43dB reduction in noise levels (calculated using DIN 52210 Testing of Airborne and Impact Sound Insulation). The construction details are as follows (from inside to out):

- 1.5mm steal sheeting with anti vibration characteristics;
- 100mm of mineral fibre; and
- 1mm steal sheet.

The crushed WEEE is passed through a sifter box (F2.1), which is used to de-dust relatively fine materials with a tendency to 'felt'. The objective is to separate the fine metal particles contained in this fraction from the fine dust, so that the metal can be recovered and added to the final product stream(s). The waste stream is then transferred to conveyer (H2.3), which transports the material over a belt magnetic separator (F2.2). The magnetic separator removes the larger ferrous items from the WEEE stream for subsequent compaction in an onsite baler, refer *Drawing 04* Scrap iron from this point is identified on the waste list in *Attachment H.4 as 2.2 Iron*, which is sent for

recycling at smelters around Europe via *Dietiker AG für Rohmetalle* (1), a specialist virgin and secondary metal alloy recycler. Further details are provided in *Attachment H.4*.

Following from the magnetic separator (F2.2), the remaining material proceeds along a conveyer (H2.4) to a Ripple Chute (H2.5) and through a Splitting Drum Separator (F2.7). The two units in combination separate the material into coarse and fine fractions. The fine fraction (which is the smaller and lighter fraction) proceeds to Module 3 (H3.8) and the coarse fraction (larger and heavier fraction) is taken by a second vibrating chute (H2.6) to a sorting station. Prior to entering the sorting station, an over belt magnetic separator (F2.8) further separates the course fraction into ferrous and non-ferrous fractions.

The ferrous fraction is collected as a *waste stream 2.2* (refer to *Attachment H.4*) and the non-ferrous fraction is deposited onto a picking belt conveyor (H2.7) where different fractions of waste WEEE are manually sorted. The picking belt conveyor allows for the visual identification and manual separation of materials. In particular, any material which has residual ferrous material still attached, or material which cannot be further separated in its current state (MIX) is collected and reintroduced into the system at the beginning of Module 2 at point (H2.1) for further processing.

The separated fractions at the end of Module 2 include aluminium, transformers, batteries, motors, copper, plastics and 'mix' (items that require additional break down to make recovery viable). Once separated, these fractions are collected and stored in containers prior to offsite transfer with a licensed contractor for further processing/recycling/disposal or, for use as a raw material. The source and storage of each fraction is shown on process flow diagram *Drawing 14* and details of the estimated waste volumes arising from Module 2 is provided in *Attachment H.4*.

Emissions Control

Air from the QZ is extracted by a ventilator (V2.1) and delivered to a box sifter (F2.1) where the processed material from the QZ is to be further processed.

The resulting air discharged from the box sifter is extracted by a second ventilator (V2.2) and is delivered to the dust abatement system (F2.3 – F2.6). Air emissions from the QZ (Z2.1) and box sifter (F2.1) are drawn through a Multicone Sifter (F2.3), a High Performance Cyclone (F2.5) and a Jet Filter (F2.6). Additional detail on these systems is provided below.

The extraction ventilator (V2.2) assists in drawing the air emissions through the vent header system and discharges the exhaust gases to the environment via a stack (A1-1) at the southern end of the building. This is the Site's only designated 'major emission' point. The Multicone Sifter (F2.3) receives air

(1) Web page: http://www.dietiker.ch/dietiker-group_ch/en/Home/Overview.php

discharged from the Box Sifter (F2.1) and is used to de-dust relatively fine materials with a tendency to felt. The objective is to separate the fine dust particles contained in the air flow. This dust fraction is collected as a *waste stream 2.1 cyclone dust*. It is noted that when campaigns of certain equipment (e.g. printed circuit boards) are being carried out, this cyclone dust waste stream may have significant quantities of plastic/metal attached to it and is therefore further processed in Module 4. The dust fraction can also be redirected for further processing if the operator notices that the dust contains a significant amount of plastic/metal.

The Screening Machine RSM 500/1300 (F2.4) is used to deliver the dust to the collection bag, and is not currently operating as a true 'screening machine' (as the screen is not in place). The Screening Machine could be used to provide further sub-division of the dust particulates in the future, if this is deemed to be beneficial and cost effective.

The lighter fraction (i.e. felt, dust, etc) from the Multicone Sifter (F2.3) is delivered to a High Performance Cyclone (F2.5) which separates out the filter/cyclone dust. Its operation is based on the centrifugal acceleration of the particles contained in the flow of air, caused by the tangential air intake. The centrifugal force presses the particles against the outer wall of the cyclone shell. These particles are then discharged towards the bottom of the cone in an 'outer whirl' and are collected in an enclosed bag/bin. However, as most of the air can not escape from the cyclone via the bottom discharge, a second inner 'whirl of air' develops, which leaves the cyclone via the central upper tube.

The lighter particles, which cannot be forced against the cyclone wall due to insufficient centrifugal acceleration, are entrained in the inner whirl and are discharged through the top. The remaining emissions (an air/dust mixture) are then passed through the Tube Jet Filter (F2.6) which removes the residual dust before the gas is exhausted to atmosphere through the major emission point (A1-1), at a stack height 3m above roof level. The Tube Jet Filter has 88 tubes of antistatic polyester material with a total surface area of 65m^2. Its specifications indicate that it will remove dusts to a particle size of 5-10 microns at an anticipated flow rate of 10,000 m^3/hr.

The materials collected by the dust abatement system are given specific waste stream number (refer *Drawing 14* for the process flow diagram). Details of the estimated volumes and the intended disposal routes are provided in *Attachment H.4*.

The Design and Operating Manuals for the key air emissions control systems, namely the Multicone Sifter, the High Performance Cyclone and the Jet Tube Filter are provided in *Annex F1-1*.

Waste Arising

Of the WEEE that is processed on the Site, approximately 32% of the material is recovered/ separated in Module 2. The collected fractions include metal (ferrous and non-ferrous), capacitors, batteries, plastic, printed circuit boards and dust. A detailed breakdown of the various waste streams arising is provided in *Attachment H.4*.

Module 3- Mechanical Separation

The fine fraction which was separated from the Splitting Drum Separator (F2.7) is redirected to Module 3 and proceeds via a conveyer belt (H3.8) to a Ripple Chute (H3.9). Here the fine fraction is exposed to impulses from the bottom of the trough, which conveys the material towards the end of the trough in projectile motion. At the same time, the material is distributed over the entire width of the bottom of the trough. 'Unbalanced' motors are used to vibrate the trough multi-directionally. The material then passes an over a Belt Magnetic Separator (F3.9) which removes ferrous material (*waste stream 3.5*). These are sent to picking station (B3.1) for further hand sorting.

The remaining material passes through a Drum Magnetic Separator (F3.10). The ferro-magnetic parts contained in the feed material are magnetized by the fixed magnetic field inside the drum and stick to the rotating drum rotor. The bars welded to the drum rotor entrain the adhered material and transport it out of the magnetic field. As a result of gravity and centrifugal force, the magnetic material drops down from the drum shell, while the non-magnetic material is discharged from the drum using a normal discharge parabola. The two products (ferrous and non-ferrous) can be separated by means of adjustable separating sheets, or by the positioning of the collection devices. The ferrous material is collected as a *waste stream 3.5* and sent to picking station B3.1 for further hand sorting. The non-ferrous fraction then passes onto another Ripple Chute (H3.10) and to a Non-ferrous Metal Separator (F3.11).

The Non-ferrous Metal Separator (F3.11) incorporates a rapidly rotating permanent magnet pole system. The fast alternating frequency of the magnetic field produces strong eddy currents in the non-ferrous metal parts which, in turn, produce magnetic fields with a repulsing effect to the external magnetic fields. For this reason, the non-ferrous parts are ejected from the remaining material flow. Material removed at this stage is identified as *waste stream 3.3* (potentially containing copper, zinc, lead, magnesium and aluminium) and is directed to a hand sorting station (B3.1).

Material that has not been removed at the Non-ferrous Metal Separator (F3.11) is fed via a Ripple Chute (H3.12) to a Density Separator (F3.12) which separates the material into light and heavy fractions, (of which the heavy fraction is sent to B3.1 for further sorting). This is shown in the process flow diagram *Drawing 16* and the estimated waste volumes and intended disposal routes are provided in *Attachment H.4*.

The Density Separator (F3.12) separates products of different specific weights, regardless of their size. However, the closer the particle size of the feed product, the higher will be the separation accuracy. The product being fed into the density separator is evenly spread onto the inclined working screen by means of a spreading device. Compressed air is then blown through the screen from underneath by a fan (V3.3). The air from underneath the screen cushions the lighter fractions causes the material to 'float'. Material of higher specific weight settles onto the working screen, while material of lower specific weight floats to the surface. Due to the uneven movement of the screen, the material of higher specific weight, (which rests on the screen), is transported towards the upper part of the screen, where it is collected. While the lighter fraction 'floats' towards the lower end of the screen, and is collected.

The fan (V3.3) also continually re-circulates a fraction of the air from the Density Separator through a High Performance Cyclone (F3.15). This aids the separation process and also removes a Light Fraction *waste stream 3.6* from the air, which is combined with the Light Fraction from Density Separator (F3.12) and sent on to Module 4 for further processing.

The hand sorting work station is made up of a Silo (B3.1), Ripple Chute (H3.13) and Conveyor (H3.14). Materials sorted at this stage include batteries, capacitors, metal fractions, material to be returned to H2.1 in Module 2 and material to go on to B4.1 in Module 4. Further details on the estimated breakdown, volumes and intended destination of the waste separated at this stage are presented in *Attachment H.4*.

Emissions Control

A Fan (V3.4) draws air from the Density Separator (F3.12) and passes it through a Vibrating Filter Type 200/36 (F3.14). The Vibrating Filter is charged at the feed nozzle, the dust and gas mixture is conveyed through pipelines, into the filter feed box to be distributed over the filter material, (60m^2 of antistatic polyester material in the form of multiple pipes). The carrier gas flows from the inside through the filter material to the outside, while the dust deposits itself on the inner surfaces of the filter pipes. There, a filter 'pre-coat' develops, which further improves the filtering effect. At the same time, the filter resistance increases and thus also the pressure inside the filter pipes. The developing dust layer is cleaned at regular intervals using a vibrating mechanism. The released dust falls into a discharge hopper and is removed in sealed bags as a *waste stream 3.7 in Attachment H.4*.

Waste Arising

Of the WEEE that is processed on site approximately 4% of the material is recovered/ separated in Module 3. The recovered fractions include metal (ferrous and non-ferrous), capacitors, batteries, motors and dust. Additional detail of the waste streams arising in Model 4 is provided in *Attachment H.4*.

Module 4 – Fine Separation

The light fraction from Density Separator (F3.12) and Cyclone (F3.15) and the fraction separated out at the Module 3 hand sorting station (B3.1) are deposited in the Feeding Bin and Belt (B4.1 and H4.1) which feeds the Hammer Mill (Z2.1). The Hammer Mill is designed to crush the material to a very fine grain size. The crushing takes place between two rotating hammers and a set of fixed deflection bars, located in a sealed chamber. The resulting grain size depends on the size and type of the selected exchangeable grids. A summary is provided as follows and the Design and Operations Manual for the Hammer Mill is provided separately as commercially sensitive information.

The Hammer Mill is enclosed in a sound proof room of similar construction to that used on the QZ (Z2.1) and noise levels outside the room are recorded by the manufacturers as being less than 85dB (refer to the Design and Operating manual submitted as confidential information). The material is circulated 3 times through the hammer mill, as shown the process flow diagram (*Drawing 18*) at the point between H4.6 and H4.7. The crushed material is then sent to Screening Machine RSM 500/1300 (F4.7).

On route to the hammer mill, the material travels along a conveyor belt (H2.1) through a one person picking station (H4.8) where batteries, capacitors etc are removed. This is indicated in the process flow diagram, *Drawing 18* and detailed in *Attachment H.4*. The residual material then travels along a conveyer belt (H2.2) and vibrating chute (H2.3) to the hammer mill (Z2.1).

Crushed material leaving the Hammer Mill travels along a Ripple Chute (H4.4) to a Zig Zag Classifier (F4.1). The Zig Zag Classifier (F4.1) operates on the principle of cross-flow and up-current separation. Air, drawn into the bottom of the unit via the air in-take slide valve, flows through the material falling into the feed shaft, thereby removing light material and fine dust in the air current. Due to the specially designed form of the classification area, the falling material circulates and collides with the zigzag edges of the classifier several times. This process removes most of the dust and light materials. The degree of separation depends on the number of cascades, on the amount of air removed by the ventilator and on the type and amount of feed material. Dust and light materials removed from the process pass through an abatement system which is described in the relevant section in *Attachment F1*.

Material passes from the Zig Zag Classifier (F4.1) to a Ripple Chute (H4.5) and past a Drum Magnetic Separator (F4.6). Ferrous material is removed by the Drum Magnetic Separator in the same manner as described in Module 3 (F3.10) and is collected as *waste stream 4.5,* detailed in *Attachment H.4*. Remaining material passes along a conveyor (H4.6) at which point it is either, re-circulated back to the Hammer Mill during the triple crushing process on conveyor belt H4.7 or, it is sent to a Screening Machine RSM 500/1300 (F4.7).

Unbalanced motors vibrate the screening machine and the screen surfaces, which are tightly braced to the casing of the screening machine, and therefore also vibrate. The material to be screened is exposed to impulses conveying the material towards the discharge, in a projectile motion. Particles smaller than the width of the corresponding screen pass through and are transported to the collection bag/bin for this sized fraction. The vibrations cause the material to be projected approximately 10 - 20 mm high, to guarantee sufficient loosening of the material and self-cleaning of the screen surface. The size, and hence, content, of the screened fractions is selected by adjusting the screen sizes. Three *waste steams 4.1, 4.2* and *4.3* are collected as indicated in process flow diagram *Drawing 18* and detailed in *Attachment H*.4. The waste fractions are stored until there is sufficient quantity to process that fraction through the Air Jig (F5.1).

Air Jig (Heavy Parts Separator)

Once sufficient quantities of the *waste streams 4.1/4.2/4.3* are available, they are individually processed through the Air Jig unit (F5.1) which separates particles into high density (*4.1* and *4.3* - *metal*) and low density (*4.2* - *plastic*) fractions, by blowing air through the incoming feed stock. The Air Jig separates products of different specific weights, regardless of their size. The closer the particle sizes of the product, the higher the separation accuracy. The product being fed into the density separator is evenly spread onto the inclined working screen by means of a Ripple Chute (H5.1) and conveyor belt (H5.2). As described previously, compressed air is blown through the screen from underneath by a fan (V5.1). The eccentric drive supplies the screen with movement to transport the heavier material towards the upper part of the screen. While the air from underneath cushions the lighter products and makes them float towards the bottom of the screen.

A second fan (V5.2) removes the air from the machine, ensuring that the amount of outgoing air always exceeds the amount of air blown in from underneath the screen. In that way, a slight negative pressure is created within the machine. This prevents dust from escaping from the machine.

Electrostatic Separation

Material recovered from the air abatement systems (F4.2 and F4.5) associated with the Zig Zag Classifier (F4.1), (as described in the following section on *Emissions Control),* is further processed through the Electrostatic Separator (F6.1) to remove metallic material.

The Electrostatic Separator can be used on granulated products with a density of 1-3 g/cm^3 and a grain size of 0.1 to 3 mm. Once sufficient material is collected, it is placed in a Silo (B6.1) and fed via Conveyor (H6.1) onto a rotating, earthed drum via a material feeder. The feed mixture is transferred into a corona electrode field, (coupled with a static field electrode, to improve the separation effect) and is electro-statically charged in the high voltage field. Conductive materials (with good surface conductivity) loose their charge very quickly and are thrown off the drum due as part of the drum revolution.

Non-conductive materials, with less surface conductivity, hold their charge for longer and stick to the drum. Non-conductive materials, which are not de-charged while stuck on the drum, move into the neutralising electrode field. This material will be de-charged and the non-conductive materials will fall off the drum. Non-conductive material which does not fall off the drum will be mechanically removed (i.e. brushed off).

As a result of these separation processes, there are three products arising from the Electrostatic Separator: a conductive, non-conductive and mixed product. These are categorised as *waste streams 4.1 and 4.2*, details of which are provided in *Attachment H.4*.

Emissions Control

The feeding bin (B4.1) is connected to a ventilator (V4.2) which draws air through a dust filtration system (F4.8) resulting in the collection of dust for disposal (*waste stream 4.4*). The filter system is an *Infastaub Gmgh & Co.* bag filter which discharges the clean air back into the working environment. There is no external stack or formal emission point for this filter.

Air emissions from the Hammer Mill (Z4.1), Zig Zag Classifier (F4.1) and Picking Station (H4.8) are drawn through an air abatement system by a fan (V4.1) and are initially ducted to a Multicon Sifter Type MKS (F4.2). The sifting is based on the principle of cross-flow and up-current separation. The material drawn into the feed shaft is deflected at the central connection inside the sifter. It is distributed sideways via a central distribution cone. Simultaneously, air is sucked in from the outside via a scavenging air valve, and flows through the material (centrally) from the bottom.

Dispersible light material is entrained in the upward air current and is separated in the subsequent filter. The expansion of the sifting area towards the top, results in a reduction of the air velocity from the lower part to the upper part of the filter. This causes light material entrained at the beginning to drop down again along the sifter walls. In the lower part of the sifter, this lighter material will be removed with scavenging air via a lateral belt of ports, which can be adjusted by means of a rotary valve. The scavenging air further separates fine particles from the light material, which is carried away by the sifting air to a High Performance Cyclone (F4.3).

This interaction of different air currents and vortexes inside the sifter, together with the zigzag walls of the sifter housing, leads to strong material circulation and contact.

The discharged material then passes through a Screening Machine RSM 500/1300 (F4.5), which operates in the same manner as Screening Machine RSM 500/1300 (F4.7) which was described previously in the Module 4 process description.

There are three waste streams collected from the Screening Machine, as shown in the process flow diagram, *Drawing 18,* which are sent either to the Electrostatic Separation Machine (F6.1), to the Hammer Mill (Z4.1) for further processing or are discarded as *dust waste stream 4.4 (*details provided in *Attachment H.4*.) The decision on whether to reprocess a collected stream or discard it, depends on the type of material being processed in the Hammer Mill and the judgement of the operator.

The light fraction which is drawn off from the Multicon Sifter (F4.2), passes through a High Performance Cyclone (F4.3) which operates on the exactly same principal as the cyclone in Module 2 (F2.5). The *waste stream 4.4* from the cyclone is collected for disposal and details are provided in *Attachment H.4*.

The remaining air passes through a Tube Jet Filter (F4.4), a duplicate of the Module 2 Jet Filter (F2.6), which removes the residual dust before the cleaned air is discharged to atmosphere via emission point (A1-1), through a stack 3m above roof level.

The air drawn out of the Air Jig by the fan (V5.2) is passed through a Vibrating Filter 200/36 (F5.2), which is a duplicate of the Vibrating Filter (F3.14) in Module 3. This removes residual particulates prior to discharging the cleaned air back into the building (i.e. there is no external emission point). Details of the disposal route for the collected filter dust, *waste stream 4.4* are provided in *Attachment H.4*.

The air drawn out of the Electrostatic Separation unit by the fan (V6.1) removes the light dust fraction and passes it through a Vibrating Filter (F6.2), which operates in the same manner as the Vibrating Filter 200/36 (F3.14), described in Module 3. Details of the disposal route for the collected filter dust fraction, *waste stream 4.4* are provided in *Attachment H.4*.

The Design and Operating Manuals for the key air emissions control systems, namely the Multicone Sifter, the High Performance Cyclone and the Jet Tube Filter are provided in *Annex F1-1*.

Waste Arising

Of the WEEE that is processed on the Site, approximately 34% of the material is recovered/ separated out in Module 4. The fractions include metal (ferrous and non-ferrous), plastic and dust, and a detailed breakdown of the waste streams arising is provided in *Attachment H.4*.

Processed Material

Approximately 94% of all material processed on site is able to be directly reused, either as a raw material (e.g. metals in a foundry/smelter), or can be recycled for reuse (e.g. plastics). This will be done at third party, appropriately licensed facilities.

The different fractions of material are collected in separate containers and are stored onsite until a sufficient quantity is accumulated to allow cost effective transported to the final destination. All offsite transport will be undertaken using appropriately licensed, third party waste contractors.

Material that is not able to be processed onsite (e.g. WEEE containing ODSs, PCBs or asbestos) will be stored in designated and contained areas, within the production building, prior to being sent off-site to an appropriately licensed treatment facility.

Annex D2-1 Equipment Listing

1.1 EQUIPMENT NUMBER LIST

Equipment ID No.	Description
Module 1	
H1.1	Preparing station
H1.2	Inlet conveyer
F1.2	Messurement system
Z1.1	Cutting station
H1.3	Outlet belt
F1.3	Hoover station
Module 2	
H2.1	Under floor feeding belt convayor
H2.2	Vibrating Chute
Z2.1	QZ
F2.1	Discharge sifter box
V2.1	Radial Ventilators or fans
H2.3	Belt convayor
F2.2	Overbelt magnetic seperator
H2.4	Belt convayor
H2.5	Ripple vibrating chute
F2.7	Splitting drum seperator
H2.6	Vibrating chute
F2.8	Overbelt magnetic seperator
H2.7	Picking belt convayor
Module 3	
H3.8	Belt convayor
H3.9	Vibrating Chute
F3.9	Overbelt magnetic seperator
F3.10	Drum magnetic seperator
H3.10	Vibrating chute
F3.11	Belt convayor
F3.11	Non-ferrous-metal-seperator
H3.12	Vibrating Chute
F3.12	Density Seperator
F3.13	Discharge sifter box
V3.3	Radial Ventilators or fans
X3.8	Discharge wheel Sluice
H3.14	Belt convayor
B3.1	Silo
H3.13	Vibrating feeder

Equipment ID No.	Description
Module 4	
H4.1	Feeding belt
B4.1	Feeding bin
X4.1	Discharge paddle
H4.8	Convayor belt
H4.2	Belt convayor
H4.3	Vibrating Chute
Z4.1	Hammer mill
P4.1	Hydraulic pump
H4.4	Vibrating Chute
F4.1	Zig zag shifter
H4.5	Vibrating Chute
F4.6	Drum magnetic seperator
H4.6	Belt convayor
X4.10	Discharge paddle
F4.7	Sieving machine
H4.7	Belt convayor
B2.2	Feeding funnel
Air Jig	
B5.1	Silo
H5.1	Vibrating feeder
H5.2	Belt convayor
F5.1	Airjig
V5.1	Radial Ventilators or fans
Electrostatic	**separation**
B6.1	Silo
H6.1	Pipe feeder
X6.1	Vibrating console
F6.1	Electrostatic Seperator
H6.3	Convayor belt
H6.4	Convayor belt
H6.5	Convayor belt
H6.6	Convayor belt

Air Emission	Treatment
X1.1	Cyclon
X1.2	Filter
X1.3	Hoover cyclon
V1.1	Ventilator
V3.4	Radial Ventilators or fans
F3.14	Shacking filter
X3.4	Discharge wheel Sluice
X3.9	Discharge wheel Sluice
F2.3	Multicone sifter
X2.1	Discharge wheel Sluice
X2.7	Discharge wheel Sluice
X2.8	Discharge wheel Sluice
F2.5	Cyclone
X2.2	Discharge wheel Sluice
F2.4	Sieving machine
F2.6	Jet filter
X2.3	Discharge wheel Sluice
V2.2	Radial Ventilators or fans
X2.5	Discharge wheel Sluice
F4.8	Vibrating filter
V4.2	Radial Ventilators or fans
X4.2	Discharge wheel Sluice
V5.2	Radial Ventilators or fans
X5.2	Discharge paddle
F5.2	Vibrating filter
X5.1	Discharge wheel Sluice
F4.3	Cyclone
X4.4	Discharge wheel Sluice
F4.4	Jet filter
X4.5	Discharge wheel Sluice
X4.9	Discharge wheel Sluice
V4.1	Radial Ventilators or fans
F4.2	Multicone sifter
X4.3	Discharge wheel Sluice
F4.5	Sieving machine
V6.1	Fan
F6.2	Vibrating Filter

Emissions to Atmosphere

Attachment E1

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. №:	A1 – 1 Main Tube Jet Filters
Source of Emission:	Module 2 and 4 emissions abatement systems
Location :	Soutern end of roof
Grid Ref. (12 digit, 6E,6N):	309432E, 232654N
Vent Details **Diameter:** **Height above Ground(m):**	 450mm 15m
Date of commencement:	28/03/2006

Characteristics of Emission:

(i) Volume to be emitted:			
Average/day	320,000 m^3/d	Maximum/day	480,000 m^3/d
Maximum rate/hour	20,000 m^3/h	Min efflux velocity	34m.sec^{-1}
(ii) Other factors			
Temperature	50°C(max)	Not Specified °C(min)	Ambient °C (avg)
For Combustion Sources: **Not Applicable** Volume terms expressed as : ☐ wet. ☐ dry. _____ $\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr up to 24 hr/day 286 day/yr

Comment:

Production details have not been finalised. The figures reported are considered to be the maximum levels that will be achieved when the site reaches maximum capacity in approximately three years (end of 2008). Until this time, it is anticipated that the level of emissions and their duration will be considerably less than outlined in the tables above.

Additionally, the QZ and Hammer Mill are unlikely to operate in tandem, at full capacity, even when the plant is running 24 hours. The figures in *Characteristics of Emission - Part E (iii)* are based upon the plant running continuously five and a half days a week for 52 weeks of the year. *Attachment I* assesses the impact of the predicted emissions to atmosphere on the surrounding environment, using these same assumptions.

The Best Available Technology (BAT) for the abatement of these emissions, which will be predominantly fine grained particulates, has been taken into account in the development of the abatement systems. The air streams discharged from both the QZ and Hammer Mill are passed through an abatement train, which operates in series, and incorporates a Multi-Cone Sifter, a High Performance Cyclone and a Jet Tube Filter. The use of a cyclone and filter in series is considered BAT for the abatement of particulates under the EU BREF Note for the Waste Sector.

In addition, the BAT emission level for particulates is 20mg/m^3, while the aforementioned abatement system has been demonstrated to consistently achieve 1mg/m^3. The Operator is seeking a Licence limit of 5mg/m^3 for particulates which is 25% of the BAT limit.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: *A1 - 1 Main Tube Jet Filters*

Parameter	Prior to treatment(1)				As discharged(1)					
	mg/Nm³		kg/h		mg/Nm³		kg/h.		kg/year	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Dust/Particulates	Unknown	Unknown	Unknown	Unknown	0.9	1.3	0.014	0.037	104.83	277.06
Total Metal	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Brief Description of the Treatment Process.	Extracted air is passed through a three step treatment process. Air emissions from both Module 2 and 4 each pass through a Multicone Sifter, a High Performance Cyclone and a Tube Jet Filter system. The Filter contains 88 tubes of synthetic material; PE (40µm, 5 µm); with a total surface area 65m². The emissions from each system combine to discharge through a single stack (A1-1).									

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

Comment: The chemical characteristics described in Table E.1 (iii) are based upon results from a sampling and analysis programme undertaken at a 'sister site' operating in Switzerland. The sister site uses identical processing equipment and abatement technology. The Swiss national standards for air emissions does not require the conduct of metal analysis for air emissions which contain less than 1mg/m³ of total particulates. Therefore, this data is not available at the current time. Sampling and analysis of the air emissions from point A1-1 at the subject Site, will be undertaken as a matter of priority and in accordance with the pending Licence conditions.

TABLE E.1(iv): EMISSIONS TO ATMOSPHERE - Minor /Fugitive

Emission point Reference Numbers	Description	Emission details[1]				Abatement system employed
		material	mg/Nm[3](2)	kg/h.	kg/year	
Minor **A2 - 1**	Discharge point at roof level from CRT air emissions abatement system are located on the eastern side of the building.	Dusts	Unknown			Cyclones and material filters.
Fugitive **A2 – 2 to A2 -7**	Roof ventilation – Details of the roof ventilation system are included in *Attachment E.1*	Lead Dusts Total metals Combustion Gases	Unknown Unknown Unknown Unknown			Cyclones and material filters. In house procedural cleaning and associated process dust abatement systems. In house procedural cleaning and associated process dust abatement systems. Abatement system associated with the forklift trucks engine and preventative maintenance programme.

1 The maximum emission should be stated for each material emitted, the concentration should be based on the maximum 30 minute mean.

2 Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

3 The site commits to carrying out a fugitive emissions study within 12mths of the licence being received.

Emissions to Surface Water

Attachment E2

TABLE E.2(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point: SW1 - Upstream

Emission Point Ref. №:	**SW1 – Upstream emission point**
Source of Emission:	Rainwater from the roof and hard-standing areas
Location :	North west corner of Site at S128
Grid Ref. (10 digit, 5E,5N):	309405E, 23273N
Name of receiving waters:	Shared surface water system within the industrial estate, which eventually discharges to Gallanstown Stream
Flow rate in receiving waters:	Unknown $m^3.sec^{-1}$ Dry Weather Flow $m^3.sec^{-1}$ 95%ile flow
Available waste assimilative capacity:	Unknown kg/day

Emission Details:

(i) Volume to be emitted: **UNKNOWN** – Rainfall only			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	Rainfall only____min/hr ____hr/day _____day/yr

Emission Point: SW2

Emission Point Ref. №:	**SW2**
Source of Emission:	Rainwater from the roof and hard-standing areas
Location :	North west corner of parking are to the front of the Site.
Grid Ref. (10 digit, 5E,5N):	Underground connection to the shared surface water sewer with no accessible point of referecne.
Name of receiving waters:	Shared surface water system within the industrial estate, which eventually discharges to Gallanstown Stream
Flow rate in receiving waters:	Unknown $m^3.sec^{-1}$ Dry Weather Flow $m^3.sec^{-1}$ 95%ile flow
Available waste assimilative capacity:	Unknown kg/day

Emission Details:

(i) Volume to be emitted: **Unknown** – rainfall only			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	Rainfall only____min/hr _____hr/day _____day/yr

Emission Point: SW3

Emission Point Ref. №:	**SW3**
Source of Emission:	Rainwater from the roof and hard-standing areas
Location :	North east corner of parking are to the front of the Site.
Grid Ref. (10 digit, 5E,5N):	Underground connection to the shared surface water sewer with no accessible point of referecne.
Name of receiving waters:	Shared surface water system within the industrial estate, which eventually discharges to Gallanstown Stream
Flow rate in receiving waters:	Uknown $m^3.sec^{-1}$ Dry Weather Flow $m^3.sec^{-1}$ 95%ile flow
Available waste assimilative capacity:	Unknown kg/day

Emission Details:

(i) Volume to be emitted: **Unknown** – rainfall only			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	Rainfall only____min/hr _____hr/day _____day/yr

Emission Point: SW4

Emission Point Ref. №:	**SW4**
Source of Emission:	Rainwater from the roof and hard-standing areas
Location :	Just south of SW3 approximately 10m within the parking area to the front of the building
Grid Ref. (10 digit, 5E,5N):	Underground connection to the shared surface water sewer with no accessible point of reference.
Name of receiving waters:	Shared surface water system within the industrial estate, which eventually discharges to Gallanstown Stream
Flow rate in receiving waters:	Unknown $m^3.sec^{-1}$ Dry Weather Flow $m^3.sec^{-1}$ 95%ile flow
Available waste assimilative capacity:	Unknown kg/day

Emission Details:

(i) Volume to be emitted: **Unknown** – Rainfall only			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	Rainfall only____min/hr _____hr/day _____day/yr

Emission Point: SW5 – Downstream

Emission Point Ref. №:	**SW5 – Downstream emission point**
Source of Emission:	Rainwater from the roof and hard-standing areas
Location :	North east corner of Site at S127. This manhole has been covered during the redevelopment works and will be reinstated as an inspection point.
Grid Ref. (10 digit, 5E,5N):	30945E, 23274N
Name of receiving waters:	Shared surface water system within the industrial estate, which eventually discharges to Gallanstown Stream
Flow rate in receiving waters:	Unknown $m^3.sec^{-1}$ Dry Weather Flow $m^3.sec^{-1}$ 95%ile flow
Available waste assimilative capacity:	Unknown kg/day

Emission Details:

(i) Volume to be emitted: **Unknown** – Rainfall only			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	Rainfall only__min/hr _____hr/day _____day/yr

Comment:

Emissions to the surface water drainage system arise solely from the on site rainwater collection system. No process waters are produced or discharged from the Site. Surface waters within the Industrial Estate eventually discharge to Gallanstown Stream.

A separate surface water drainage system was installed and upgraded with the redevelopment of the Park West Industrial Estate, as part of the original planning application (Ref 2529/99) and was designed to have the capacity to accommodate rainfall from the roof and hard-standing areas of the Site. *Drawing 20* identifies the surface water drainage system and emission points on site.

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number : **SW1 and SW5** ***Upstream and Downstream emission points***

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
UNKNOWN. **The discharge comprises clean rainwater from uncontaminated areas.** **There is no current or proposed treatment of the surface water.** **The Site commits to regular visual inspections of manholes SW1 and SW5, at the frequency to be specified in the pending Licence.**									

Comment: As it is anticipated that the only emission from the site will be rainwater and it is not anticipated that there will be a need to monitor for any parameters.

Emissions to Sewer

Attachment E3

ATTACHMENT E3 - EMISSIONS TO SEWER

TABLE E.3 (i): EMISSIONS TO SEWER (One page for each emission)

Emission Point: Not applicable – there are no process or trade waste streams discharged from the Site.

Emission Point Ref. №:	
Location of connection to sewer :	
Grid Ref. (10 digit, 5E,5N):	
Name of sewage undertaker:	

Emission Details:

(i) Volume to be emitted			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	_____min/hr _____hr/day day/yr

Comment:

Emissions to sewer are from the Site's sanitary facilities only. No process wastewater or trade wastes are discharged from the site. Therefore, notification to Dublin City Council is not required in this situation. The drainage system was upgraded with the redevelopment of the Park West Industrial Estate and was designed to have the capacity to accommodate sanitary discharges from all the units within the Industrial Estate. *Drawing 09* shows the layout of the Site's sanitary drainage system.

TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number: ***Not Applicable***

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	

Comment: As only emission from the site will be from sanitary facilities there will be a need to monitor for any parameters.

Emissions to Groundwater

Attachment E4

TABLE E.4(i): EMISSIONS TO GROUNDWATER

Emission Point or Area: NOT APPLICABLE – there are no direct or indirect discharged to ground or groundwater from the Site

Emission Point/Area Ref. №:	**NOT APPLICABLE**
Emission Pathway: (borehole, well, percolation area, soakaway, landspreading, etc.)	
Location :	
Grid Ref. (10 digit, 5E,5N):	
Elevation of discharge: (relative to Ordnance Datum)	
Aquifer classification for receiving groundwater body:	
Groundwater vulnerability assessment (including vulnerability rating):	
Identity and proximity of groundwater sources at risk (wells, springs, etc):	
Identity and proximity of surface water bodies at risk:	

Emission Details:

(i) Volume to be emitted			
Normal/day	m^3	Maximum/day	m^3
Maximum rate/hour	m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	_____min/hr _____hr/day _____day/yr

Noise Sources

Attachment E5

Table E.5(i): NOISE EMISSIONS - Noise sources summary sheet

Source	Emission point Ref. No	Equipment Ref. No	Sound Pressure[1] dBA at reference distance	Octave bands (Hz) Sound Pressure[1] Levels dB(unweighted) per band									Impulsive or tonal qualities	Periods of Emission
				31.5	63	125	250	500	1K	2K	4K	8K		
QZ Machine and associated conveyors and sorting machinery (309440E, 232656N)	N5	Z2.1	90 dBA @ 1m from the door of the QZ machine, (inside the building).	88	85	86	91	86	82	81	81	74	Not noticeable during monitoring	Continuous during use
Hammer Mill (309422E, 232667N)	N6	Z4.1	83 dBA @1m from the door of the Hammer Mill, (inside the building).	81	93	86	77	76	76	78	75	69	Not noticeable during monitoring	Continuous during use
CRT Machine (309466E, 232685N)	N7	Z1.1	<85 dBA @ 4m from the side of the CRT machine (inside the building).	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		While CRT is being cut – approximately 1 minute per CRT

1. For items of plant sound power levels may be used.
2. n/a – information currently not available.
3. Reference should be made to *Drawing 20*.

Environmental Nuisance

Attachment E6

E6 ENVIRONMENTAL NUISANCES

E6.1 DUST CONTROL

The discharge points from all internal air emissions (which have the potential to generate fugitive emissions), are linked to a number of purpose designed dust abatement systems. In addition, the doors to the building are kept closed when not in use.

A high level of housekeeping is maintained through the use of a *Karcher* "KM85/50W Walk behind vacuum sweeper". The area is swept using the vacuum system on a regular basis, at least twice per week, to help reduce the potential for fugitive dust emissions from the site.

E6.2 FIRE CONTROL

Copies of the Fire Certificates for the building are included in *Attachment J1-2*.

Fire hydrants are available around the perimeter of the Site (i.e. externally), however, there are no permanent fire suppression systems (e.g. sprinklers), within the building. Fire hoses are not permitted within the building for safety reasons, however fire extinguishers are provided at several locations (as indicated in *Drawing 11*)

Given the nature of the products involved, the Operator considers the Site generally poses a low fire risk. The Hammer Mill and QZ Machine have been identified as two pieces of equipment with a potentially higher fire risk. For this reason, a specifically designed water-based quench system has been installed above each of these machines. A summary is provided as follows.

QZ and Hammer Mill Quenching System

A temperature sensor has been installed at the exit point of both items of equipment. This is linked to a digital controller mounted beside the original control and monitoring panel on each machine. In the event of the temperature exceeding a pre-set value, a flashing beacon and an audible alarm will be initiated to alert staff. In the event that the temperature continues to rise to a value in excess of a predefined differential value, a two port solenoid valve on the water line will be energised and will initiate the water drench into the equipment. The system will be incorporated into the overall plant monitoring and control system and is alarmed.

This system will only be used in extreme emergencies and the majority of the water released would be evaporated in the quench process. In addition, there are no floor drains inside the production building and any residual water

would be mopped up. Therefore, this potential wastewater discharge is not considered a routine emission point.

E6.3 TRAFFIC CONTROL

Traffic associated with the Site will be comprised of vehicles delivering and removing WEEE and processed fractions.

There are ten car and four truck parking spaces located at the front (north) of the building, as shown in *Drawing 05*. However, as Industrial Estate was designed to provide employees with an extensive range of public transport options, the Operator does not propose to allow onsite employee parking. Details of the traffic impact assessment for the estate can be found in the original EIS submitted for the development of the Estate (Planning permission 2529/99) and the current Industrial Estate Transportation Plan is included in *Annex D1-1*.

Employees who choose to travel by car will be required to use facilities within the Park West Industrial Park. It is anticipated that a maximum of four parking spaces will be required for management and the remainder will be set aside for visitors or for the temporary parking of small vehicles delivering WEEE, (prior to being processed within the building).

All vehicles delivering WEEE will be required to use the weighbridge in the north-east corner of the Site, as highlighted in *Drawing 04*. It is anticipated that at maximum capacity there will be up to 15 vehicle deliveries (both trucks and delivery vans) per day, which equates to a total of 30 vehicle movements. This is based on a maximum annual throughput of 38,000 tonnes of WEEE per annum, (730 tonnes per week), and further assumes that deliveries will be over a six day week and each truck has an average load of approximately eight tonnes.

There are four truck docking bays, located along the front (North) of the building, with two either side of the car parking area. The Operator does not own any of the delivery vehicles and long term parking of delivery trucks will not be permitted on the Site.

The unloading of trucks is expected to take approximately 45 minutes, as the WEEE is to be delivered on pallets. WEEE is also expected to arrive onsite from Civil Amenity Facilities in dumper trucks. These will empty their load directly into the WEEE acceptance area within the building (rather than using the docking bays) and will have a much shorter turnaround time. In the situation where more than one truck arrives on the Site, they can be weighed and parked in one of the spare spaces, prior to being moved into a vacant unloading bay. Alternatively, the vehicles may be temporarily parked along the western side of the building (within the Site boundary).

Processed material will also be removed from the Site. All processed material will be transported on articulated trucks and each load is anticipated to average 20 tonnes. Vehicles removing processed fractions (and wastes) from the Site will be scheduled on demand, and can be loaded and dispatched quickly as the end fractions will be pre-assembled into appropriate transportation units (e.g. metal bales, 1 tonne bags or crates). Based on the same throughput numbers above, six trucks a day will be required to move this material off site.

Combined, with the incoming WEEE, this represents a total estimate of 21 trucks per day, which represents 42 individual truck movements per day.

The facility unit was previously operated as a warehouse/distribution centre and was designed to handle large trucks and frequent vehicle movements. It is therefore well equipped for the parking, loading and manoeuvring of such vehicles.

In addition, a Transportation Plan was developed (by the Park West Management Company) during the original EIA which covers the entire industrial estate. This specifies the potential impacts and controls associated with traffic movement within the estate (Ref: *Dublin City Council Planning Department 2529/99*), the current Transportation Plan is included in *Annex D1-1*.

E6.4 ROAD CLEANING

There are no internal roadways on the Site, only parking areas. These areas will be swept using the vacuum system and/or brooms as appropriate, if required (e.g. after periods of prolonged dry weather).

The Management Company for the Parkwest Industrial Estate regularly clean the roads throughout the Estate, including those outside of the subject Site.

Treatment Abatement & Control

Attachment F1

F1 TREATMENT, ABATEMENT AND CONTROL SYSTEMS

F1.1 GENERAL INTRODUCTION

All critical production and control equipment used in the process is controlled and monitored by a central computerised control system. A copy of the Operations Manual for the processing equipment and the associated control system has been submitted as confidential information. The Manual outlines the start-up, shut down and emergency procedures for each Module. A copy of the CRT operation manual is also provided as confidential information. Manuals relating to the operation of the abatement equipment are included in *Annex F1-1*.

F1.2 EMISSIONS TO AIR

Overview

There are two point source air emissions from the process (one major and one minor emission) that vent to the environment from independent stacks located on the roof, *Drawing 20*. There are also four point source emissions that discharge internally to the building, *Drawing 04*, which may contribute to fugitive emissions from the site.

The main air emissions from the site are likely to be particulates (dust), including some entrained metals. Processing of the WEEE produces dust due to the manual and physical operations carried out. Where possible, dust extraction has been incorporated to capture the dust at the point of origin, as this allows greater recovery of the metal fractions.

Particular pieces of equipment with the potential to create significant amounts of dust i.e. the CRT, QZ and Hammer Mill, are fully enclosed and discharge directly to a purpose-designed abatement system. This vents to the atmosphere from a stack on the roof.

There are also a number of other dust collection and treatment systems, which discharge internally, (i.e. inside the building). These are typically associated with the discharge of semi-processed material into feeding bins, and several fine-fraction separation processes.

To determine whether a specified emission to atmosphere was of a 'major' or 'minor' nature, reference was made to the BREF (1) *Reference Document on Best Available Techniques for the Waste Treatment Industries, August 2005*. The BREF guidance notes indicate that the best abatement technique for both particulates and the metal fraction of the dust is through the use of material filters and that

(1)Under the Directive 96/61/EEC, licence conditions must be based on Best Available Technology (BAT) as defined in Article 2.11. In the absence of national BAT Guidance Documents reference should be made to the BAT reference documents (BREF) organised by the European IPPC Bureau.

the combination of abatement techniques improves the efficiency of material recovery. For the major emission point (A1-1), a three step abatement system has been installed, which combines cyclone and filter technology. This is outlined in more detail below. The emissions levels that can be achieved through this technology, which is considered to be *Best Available Technology* (BAT), are outlined in *Table F1.0*.

Table F1.0 Emissions levels associated with the use of BAT

Air Parameter	Emission level, mg/m^3
Dust/ Particulate matter	5 - 20

Emission points that are determined to discharge less than or equal to 20% of the BAT guidance level are considered to be a 'minor emission' (i.e. if the emission levels of dust that are less than or equal to 4mg/m^3).

For the purpose of this assessment, the air emissions sources were modelled using the purpose-design H1 software tool, using their key emission characteristics, namely total particulates and lead. The output levels from the software program were then compared against the short-term and long-term environmental benchmarks (1) for ground level concentrations arising from emissions to air as follows.

	Short Term (µg/mg)	Long Term (µg/mg)
Particulates	50	40
Lead	-	0.5

Emissions which were shown to exceed more than 10% of the relevant short term criteria, or more than 1% of the relevant long term criteria, were considered to be 'major' emission points. All other emissions were considered to be 'minor'.

Each of the emission points, both internal and external, have several items of abatement equipment, working in series, associated with them. Details of each source and the corresponding abatement items are provided in the following sections. Reference should also be made to *Drawings 12 to 19* (Process Flow Drawings) to confirm their location and sequencing.

The Operating Manuals for the listed abatement equipment are also included in *Annex F1-1* of this Attachment. The Manuals outline the operational characteristics of the abatement equipment, the maintenance requirements, error analysis, spare parts lists and provide technical drawings of the equipment.

(1) Irish Air Quality Standards

Major Emission Point A1-1

Emission Point A1-1, is the Site's only major air emission point and vents from a 3m stack located on the roof towards the southern end of the building (refer *Drawing 20*). This emission point discharges the combined emissions from two separate abatement systems which collect and treat process air arising from Module 2 and Module 4. The abatement equipment associated with each of these systems, in the sequence used, is listed below.

Module 2 - Air Abatement Equipment

F2.3 – Multicone Sifter Type MKS 1500/400
F2.5 – High Performance Cyclone
F2.6 – Tube Jet Filter

Module 4 - Air Abatement Equipment

F4.2 – Multicone Sifter Type MKS 1500/300
F4.3 – High Performance Cyclone
F4.4 – Tube Jet Filter

As the extracted air from Modules 2 and 4 discharges through a three staged treatment process, the combined effect of the three stages increases the design efficiency of any single abatement measure in isolation. As an example, the Jet Filters (F2.6 and F4.4) are reported to have a design emission rate of 20 mg/m^3 of particulates. However the three staged treatment system has been shown to consistently achieve emission figures of 1 mg/m^3 or less, at the Site's sister plant in Switzerland. A copy of the emission monitoring for the Swiss site is attached (in both German and English) in *Annex F1-2*.

The following provides a summary of the specifications for each of these abatement units, as provided by the suppliers. The most critical abatement systems are the Tube Jet Filters (F2.6 and F4.4).

F2.6 & F4.4 – Tube Jet Filters- Third & Final Stage of Treatment

Nominal Gas Flow:	10,200 m^3/hr
Filter Area:	65 m^2
Number of Tubes:	88
Length of Tubes:	1,830 mm
Tube Quality:	Antistatic polypropylene
Temperature:	50 C^o
Minimum Pressure:	-50 mbar
Over Pressure:	1.4 bar
Particle Content:	20 mg/Nm^3
Air Consumption:	8 m^3/hr
Filter De-dusting:	6 bar

F2.4 & F4.3 High Performance Cyclones – Second Stage of Treatment

Dimension:	Ø 350mm
Temperature:	Ambient
Design efficiency:	85-90%
Pressure drop:	Unknown

F2.3 & F4.2 Multicone Sifters – Initial Stage of Treatment

Dimension:	Ø 350mm
Temperature:	Ambient
Design efficiency:	Unknown
Pressure drop:	Unknown

The Tables in *Section F1* of the Licence Application document detail the Operator's commitments with regards to the monitoring, calibration and maintenance of the aforementioned abatement systems for the Site's major emission point.

The Operator is in the process of developing a computerised preventative maintenance system to include all process equipment, abatement equipment, and critical control and monitoring equipment. This system will provide an early warning of maintenance requirements, prior to the malfunction or failure of that item.

Maintenance will be undertaken using a combination of appropriately trained and experienced onsite personnel and external specialist contractors. The Operator has employed two full time professionals to develop and manage maintenance system, (namely an electrician and a fitter and turner). Where possible, contractors will be required to provide a 24 hour call out service.

TABLE F.1: ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A1-1 – Tube Jet Filters*

Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up
Pressure	F2.6 & F4.4 Tube Filters	Pressure Gauge. The pressure differential is displayed on a VDU in the control room. The gauge is monitored throughout the day and is also alarmed.	Will be calibrated annually by a specialist contractor, as per the manufacturer's requirements.	This is an integral component of the control system and will be maintained by a specialist contractor. New parts will be ordered as required.
		Manometer (Type LFR-D-MIDI ½). This is integrated within the filter and is linked to the pressure gauge.	Will be calibrated annually by a specialist contractor, as per the manufacturer's requirements.	Spare Manometer (Type LFR-D-MIDI ½)
		Filter Tubes	The filters will be visually inspected each month and will be changed as required, but at a minimum of once per year.	Filter tubes, supporting cage, 2/2-way valves 1", venture nozzles, hinge bolt clips, Ring SR, timer & burst disks. Additional detail on the recommended quantities is provided on pages 14/15 of the Operating Manual for Tube Filter DS 1.8/90/65 (*Attachment F1*).
		Compressor and associated air reservoir (Kaeser ASK 32T)	Condensate from the reservoir to be drained once a week. Equipment is serviced and maintained under an external contract.	Equipment is service and maintained under contract. Spare parts are not kept on site, as a 24hr call out service is included in the contract.
	F2.5 & F4.3 High Performance	Visual inspection of internal surfaces – weekly maintenance.	Not Applicable. Internal workings are inspected during annual shut-down.	Feed nozzle

	Cyclones F2.3 & F 4.2 Multicone Sifters	Visual inspection of internal surfaces – weekly maintenance.	Not Applicable. Internal workings are inspected during annual shut-down.	None vital to operation. Will be ordered as required.
Flow rate	F2.6 & F4.4 Tube Filters	Currently not in place. The site is investigating the best means of measuring flow in the stack.		
Temperature	F2.6 & F4.4 Tube Filters	Thermometer to be installed	Will be calibrated annually by a specialist contractor, as per the manufacturer's requirements.	Spare thermometer

Control[1] parameter	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
Pressure	Continuous monitoring of the pressure differential in the tube filters is displayed on plant control system. A pressure drop alarm is indicated on the VDU in the control room.	Manometer Type LFR-D-MIDI 1/2	Will be calibrated annually by a specialist contractor, as per the manufacturer's requirements.
Flow rate	Once installed it is anticipated that the monitoring will be continuous		
Temperature	Continuous monitoring of the temperature in the tube filters.	Thermometer	Will be calibrated annually by a specialist contractor, as per the manufacturer's requirements.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the equipment necessary for the proper function of the abatement / treatment system.

[3] List the monitoring of the control parameter to be carried out.

Minor Emission Point A2-1

Emission Point A2-1 is the Site's only minor air emission point and is associated with the CRT cutting equipment. Process air is collected from two separate activities at the workstation and is treated in separate abatement systems. The treated air streams are then combined and are discharged through a 0.5 m high stack located on the eastern side of the roof and is referred to as emission point A2-1, *Drawing 20.*

Emissions from the cutting booth are treated through a cyclone and fabric filter (equipment X1.1 and X1.2), and emissions from the hoover station are treated through a combined filter/cyclone (X1.3). The specifications for each item are outlined in the tables below. Additional technical information, including the Operating Manuals where available, is included in *Annex F1-1.*

X1.1 – Cyclone, Primary Treatment of Emissions from Cutting Station

Type:	Cyclone
Dimension:	Ø 500mm
Temperature:	Ambient
Design efficiency:	70-80%
Pressure drop:	0.8 kPa

X1.2 – Filter PH5, Secondary Treatment of Emissions from Cutting Station

Type:	Hose filter
Fabric:	Polyester- Needle felt
Specific weight:	500 g/m^2
Dimension:	Ø130mm x 1200mm
Totat filter area:	5 m^2
Temp:	Ambient
Cross speed:	3 m/min
Particle size:	max. 1 µm
Design efficiency:	>99.9% at >5µm
Emission flow:	1000 m^3/h
Pressure drop:	1.3 kPa

X1.3 – Filter Cyclone PH3 for Hoover Station

Type:	Hose filter
Fabric:	Polyester- Needle felt
Specific weight:	500 g/m^2
Dimension:	Ø130mm x 1200mm
Total filter area:	3 m^2
Temp:	Ambient
Cross speed:	3 m/min
Particle size:	max. 1 µm
Design efficiency:	>99.9% at >5µm
Emission flow:	1000 m^3/h
Pressure drop:	1.3 kPa

V1.1 – Fan (draws air through both abatement systems)

Flow:	2000 m^3/h
Operating Pressure:	6100 Pa
Power:	7.5 kW

Emission point reference number: *A2-1 – CRT Machine*

Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up
Pressure	X1.2 Filter PH5	Quarterly Pressure drop across tubes is to be checked	Use calibrated equipment to check pressure drop.	
		Filter Tubes	The filters will be visually inspected each month and will be changed as required, but at a minimum of once per year.	Filter tubes, wire baskets and valve. Additional detail on the recommended quantities is provided on pages 14/15 of the Operating Manual for Tube Filter DS 1.8/90/65 (Attachment F1).
		Cyclone	Check rubber interior and seals are intact.	
Level Sensor	X1.1, X1.2, X1.3, CRT	Cyclones and filter dust collection barrels	Annually check level sensor is operating correctly	
Low air supply		Compressor	Equipment is serviced and maintained under an external contract.	Equipment is serviced and maintained under an external contract.

Control[1] parameter	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the equipment necessary for the proper function of the abatement / treatment system.

[3] List the monitoring of the control parameter to be carried out.

Internal/Fugitive Emission Points

In addition to the two external emission points, there are four point sources which discharge treated air inside the building. These emission points have been included in the Licence Application as they have the potential to contribute to fugitive air emissions from the Site through the six roof ventilation points, or open doorways, *Drawing 04 and 20* shows the location of the internal air emission points and the roof vents.

These air streams arise from a number of different production items and are described as follows. Additional technical information has been provided in *Annex F1-1* of this Attachment where available.

F3.14 – Dust Abatement Equipment Associated with F3.12 Density Separator

Type	Vibrating Filter
Filter size:	200/36
Machine number:	42-001-015/0001
Filter area:	60 m^2
Number of filter hose:	2 x 36
Length of hoses:	1350 mm
Diameter of Hoses:	200 mm
Filter Material Quality:	PE/NF antistatic
Max Temperature:	T_{max} 50 ^{0}C

F4.8 – Dust Abatement Equipment Associated with B4.1 Feeding Bin

Type:	Mechanical Shake Filter
Make/Brand:	Infastaub Infa Mat
Model:	AM 231
Serial No.:	1553 / 03.02 - CP
Air Volume:	2,300 m^3/hr
Static Pressure:	1,750 Pa
Operating Temperature:	20^{0}C
Filter Area:	23 sq. m
Filter Media:	PO -13 Polypropylene
Exhaust Fan Type:	V-33 complete with 2.2kW, 2 P
Filter Fitted with Shaker Motor:	0.18 kW 4 Pole
Filter Control Unit Type:	ZK 0220

F5.2 – Dust Abatement Equipment associated with F5.1 Air Jig

Type:	Vibrating Filter
Filter size:	200/36
Machine number:	42-001-015/0001
Filter area approx.:	60 m^2
Number of filter hose:	2 x 36
Length of hoses:	1350 mm
Diameter of Hoses:	200 mm
Filter Material Quality:	PE/NF antistatic
Max Temperature:	$T_{max.}$ 50 C^0

F6.2 – Dust Abatement Equipment Associated with F6.1 Electrostatic Separator

Type:	Filter
Make/Brand:	Dust – Master
Type:	DM-4331
Code No.:	4155251
Voltage:	400V 3 phase – 50Hz
Motor Power:	1,5/0,25 Kw
Air Flow:	2,050 m^3/hr
Total Weight:	250 Kg
Serial No.:	30234-01

F1.3 EMISSIONS TO SURFACE WATER/SEWER/GROUNDWATER

Surface Water

The only discharge to the surface water system is clean rainwater from the building roof and external hard-standing areas. There is no access to the surface water system from any point within the building, and there is no storage of materials or chemicals outside of the building.

Surface water is directed to, and collected in, five subsurface pipelines (225-300cm diameters) as shown on *Drawing 09*. These drain into a common subsurface pipeline (450cm diameter) that runs along the northern edge of the Site. There are no abatement measures (e.g. oil/water interceptors) on any of the Site's surface water discharge points.

This 450cm diameter pipeline also receives surface water runoff from other properties and hardstanding areas within the industrial estate, both upstream and downstream of the Site. The stormwater sewer in the industrial estate eventually discharges to Gallenstown stream. There are no known stormwater abatement measures within the industrial estate.

It is the Operator's understanding that visual inspection will be required at the manhole S127 and S128, identified on *Drawing 09*, which represent the upstream and downstream points for the Site. The intervening connection points for the surface water run-off are from the parking area to the front of the building and do not have visual inspection points. The manholes currently in place will be used as the visual inspection/monitoring points for surface water discharges and are identified on *Drawing 20*. Visual inspection of the surface water discharges at these points will be carried out monthly or as specified in the Waste Licence.

Foul Sewer

No process wastewater or trade waste streams are discharged from the site. There are no floor drains or other uncontrolled access points to the foul sewer from inside the building. There is one cover located in the north eastern corner of the building. The Operator commits to sealing this cover to ensure the integrity and water tightness of the floor in this area.

There is a single connection to the foul sewer system from the staff amenity and canteen facilities. Signs will be installed above all hand-sinks stating that no liquids are to be poured down the drains. Details of the onsite sewer system and its connections to the wider industrial estate are shown on *Drawing 09*.

There is one trade waste stream generated onsite. This is condensate from the compressor which is treated in a purpose designed oil/water interceptor before being discharged into separate drums (i.e. oil and oily water). The drums of liquids will be provided with secondary containment and will be disposed offsite with an appropriately licensed hazardous waste contractor.

Given the nature of the discharges to sewer, it is not proposed to install or carry out any monitoring on the foul sewer emission point from the Site.

Ground & Groundwater

There are no direct discharges to the ground or groundwater from the Site, and limited potential for indirect discharges.

All internal and external areas within the Site boundary are covered with hardstanding in good condition, other than a narrow grass fringe along the boundaries. There are no uncontrolled access points to the surface water or foul sewers from within the building and there is no storage of waste or raw materials outside of the building.

All liquid storage areas are located within the building and are provided with appropriate secondary containment and spill kits. Refuelling of the onsite fuel

tank will be undertaken at a dedicated location inside the building and is also provided with a spill kit.

The Operator will undertake visual inspections of the Site and all working areas at the start of each day. It is not proposed to install monitoring boreholes on the Site or to carry out any routine monitoring of soil or groundwater.

Annex F1-1 Operating Manual High Performance Cyclone

Annex F1-1 Operating Manual Multicone Sifter

Annex F1-1 Operating Manual Tube Jet Filter

Annex F1-1 Operating Manual Vibrating Filter

Annex F1-1	Operating Manual High Performance Cyclone
Annex F1-1	Operating Manual Multicone Sifter
Annex F1-1	Operating Manual Tube Jet Filter
Annex F1-1	Operating Manual Vibrating Filter
Annex F1-2	Emissions Monitoring Data (English)
Annex F1-2	Emissions Monitoring Data (German)

Preface to operating manual

This operating manual shall make it easier to get to know the machine and to make use of its application possibilities in accordance with the regulations.

This operating manual contains:

1. Important notes on how to operate the machine safely, properly and efficiently.
2. Technical directives, which may not be copied, distributed or used for competitive purposes, neither completely nor in part, without authorization.

Observing these notes helps to prevent hazards, minimize repair expenses and downtimes and maintain reliability and life.

The copy rights for this operating manual, which has been handed out exclusively to the customer for personal use, remains with the manufacturer.

1. Safety

1.1 Generally applicable safety notes

The cyclone has been produced according to the acknowledged rule of technology. The latest safety standards have been applied, thereby eliminating all work-related hazards for the life and safety of operating personnel.

Before operating the machine, the operating personnel must carefully read the operating manual and acknowledge this by signature. Only then may the machine be put into operation.

The operator is responsible for the observance of the safety regulations. Prior to putting the machine into operation, the operator must introduce all operating personnel to these safety standards.

It does not contain any motor-driven parts, and therefore there are no operation-related hazards for the life and safety of the operating personnel.

The inspection doors do not provide direct access to the discharge unit.

In addition to these operating instructions, the generally applicable and local rules and regulations on accident prevention and environmental protection must be taken into account and adhered to.

1.2 EU standards and national regulations for prevention of accidents

The Cyclone has been designed according to the following European and German work safety and legal requirements:

- 98/37/EG European Machine Directive with amendments
- 73/23/EWG EU low voltage directive

Following harmonised standards are applied:

- DIN EN ISO 12100 Safety of machinery, equipments and plants
- DIN EN 292 Safety of machinery - Basic concepts, general principles for design
  Part 1 Basic terminology, methodology
  Part 2 Technical principles and specifications
- DIN EN 294 Safety of machinery; safety distances to prevent danger zones from being reached
- DIN EN 349 Safety of machinery; minimum gaps to avoid crushing of parts of the human body
- DIN EN 60204-1 Safety of machinery - Electrical equipment of machines (VDE 0113) part 1 generally standards

Applied national and technical specifications:

For the operation of the machine, the following regulations for prevention of accidents are especially applicable:

- VBG 1 General regulations
- VBG 4 Electrical installations and machines
- VBG 5 Power operated work equipment
- VBG 22 Work machines of chemical industry
- DIN 31001 Safety design of technical products
- 3rd Personal Protective Equipment Regulations

1.3 Sound proofing

In normal suction mode, the cyclone does not emit any significant noise. Noise may be emitted when pneumatically conveying granular material. In this case, a soundproofing coating may have to be applied.

2. Technical Data

See separate dimensioned drawing of high-performance cyclone.

3. Transportation

No special requirements have to be met regarding the transportation of the cyclone.

4. Assembly

No special requirements have to be met regarding the assembly of the cyclone. It must be screwed on to the base using supporting claws provided for this purpose and secured against slipping.

There are no dynamic loads.

The flanged design of the cyclone with a backing flange greatly simplifies the positioning towards the supply lines.

For any assembly work the conditions of the industrial safety regulations regarding

- assembly
- civil engineering
- welding and cutting
- hoist and separate lifting accessories
- regulations on electrical equipment

are to be guaranteed

Important!

5. Scope of Application

The cyclone is used to separate particles from air currents containing particles. Normally it is used for separation of particles prior to the following filters.

6. Operating principle

The cyclone consists of a cylinder, tapered at the bottom, with a tangential feed nozzle at the top. There is one central discharge in the upper and one in the lower part of the cyclone.

Its operation is based on the centrifugal acceleration of the particles contained in the flow of air, caused by tangential air intake. The centrifugal forces press the particles against the outer wall of the cyclone shell. The particles are then discharged towards the bottom in the form of an outer whirl. However, since most of the air can not escape from the cyclone via the bottom discharge, a second inner cyclone whirl develops, leaving the cyclone via the central upper tube. The heavy particles, which could be pressed against the cyclone wall by means of centrifugal acceleration, are discharged at the bottom via a discharge unit. The lighter particles, which cannot be pressed against the cyclone wall due to insufficient centrifugal acceleration, are entrained by the inner whirl and discharged at the top.

Since the inner vortex almost always has a fixed point of origin, it is possible for the vortex to oscillate on the cyclone wall and to take in already separated particles from this wall and discharge them; this would drastically reduce the cyclone's separation rate. To prevent this from happening, the high-performance cyclone comes with a discharge pot which has a central shielding cone to shield the separated material inside the discharge pot from the cyclone vortex. The vortex can now oscillate on the shielding cone, where there is no danger of taking in particles.

7. Initial operation

Upon initial operation:

- open the cyclone and check for foreign matter
- check central shielding cone for tight fit

Switch-on sequence:

1. Switch on suction
2. Switch on discharge
3. Switch on material supply

Switch-off sequence:

1. Switch off material supply
2. witch off discharge
3. Switch off suction

8. Maintenance and overhauling

Cyclone maintenance is limited to the daily check of the cyclone's interior space via the inspection doors provided for this purpose.

In the case of materials with a strong tendency to felting or agglomeration, such as coil wires and especially audiotape, the check should be carried out on a daily basis.

It is particularly important to check the 3 inner fastening tubes of the central shielding cone for sediments due to matted material. Sediments must be removed with a bar and discharged via the discharge unit to be switched on. Larger sediments should always be avoided since they could block the discharge unit.

The cyclone's feed nozzle must be checked for wear periodically, so it can be repaired in time.

9. Error Analysis

Error	Possible Cause	Remedy
No material discharge	Clogging inside cyclone	Open housing Remove clogging
	Discharge unit blocked	Clean discharge unit
Poor discharging results	Plunger tube at wrong height	Check position

10. Notes about the acquisition of spare parts

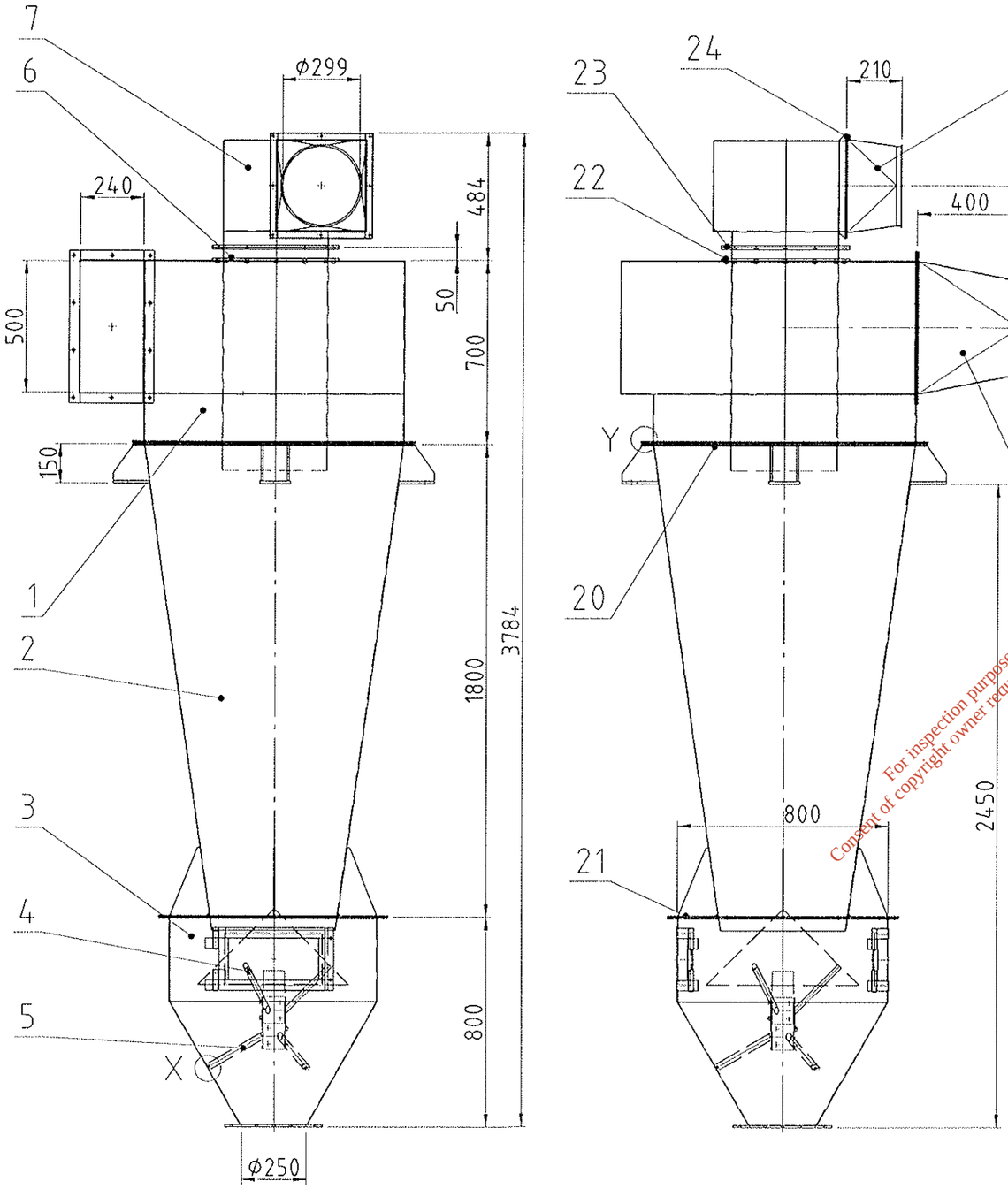
This operating manual contains a drawing and lists of spare parts for the purpose of identifying spare parts. With each order, please include the type of machine, order number, machine number and the position of the spare part. This will help us supply the desired parts more quickly.

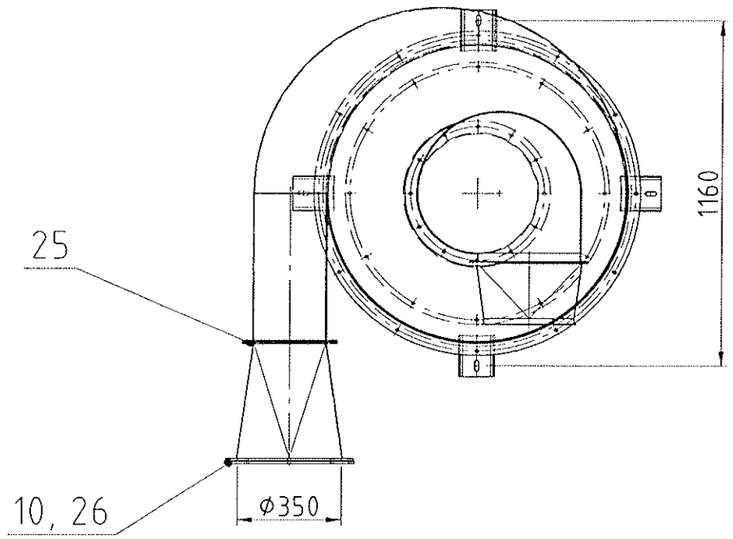
Company address:

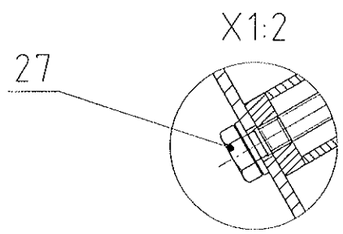
ReTek Goslar Recycling GmbH
Reußstraße 18
D-38640 Goslar
Tel.: 00 49/(0) 53 21/2 97 03
Fax: 00 49/(0) 53 21/4 02 99

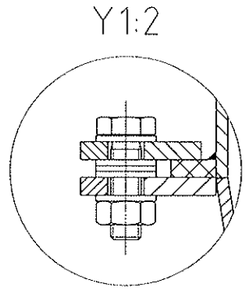
Table of contents

Attachment: Spare parts list and dimensioned drawing
High performance cyclone HZK1000
Drawing no.:30-069-205.3
Spare parts list subject no.: 30-069-205









Projekt-Nr. –	Diese Zeichnung darf ohne unsere schriftliche Genehmigung weder kopiert noch dritten Personen zu gängig gemacht werden. Jeder Mißbrauch wird strafrechtlich verfolgt.	
	Datum	Name
Gezeichnet	09.12.2000	M. Gralher
Geprüft		
Geändert		

RETEK
Goslar Recycling GmbH

Reußstraße 18
D-38640 Goslar
Telefon: (05321) 29703
Telefax: (05321) 40299

Maßstab	Benennung
1:20 – –	Hochleistungszyklon HZK 1000
	Zch.Nr. 30-069-205.3
	Datei-Pfad D:\Aufbau\30\20-069-205-2\20-069-205-2.dwg

Zeichnung CAD erstellt. Änderungen nur über CAD

Table of contents

Attachment: Spare parts list and dimensioned drawing

Multicon sifter type MKS 1500/300
Drawing no.: 30-210-055.3
Spare parts list Subject no.: 30-210-055

Preface to operating manual

This operating manual shall make it easier to get to know the machine and to make use of its application possibilities in accordance with the regulations.

This operating manual contains:

1. Important notes on how to operate the machine safely, properly and efficiently.
2. Technical directives, which may not be copied, distributed or used for competitive purposes, neither completely nor in part, without authorization.

Observing these notes helps to prevent hazards, minimize repair expenses and down-times and maintain reliability and life.

The copy rights for this operating manual, which has been handed out exclusively to the customer for personal use, remains with the manufacturer.

1. Safety

1.1 Generally applicable safety notes

The multicon sifter has been produced according to the acknowledged rule of technology. The latest safety standards have been applied, thereby eliminating all work-related hazards for the life and safety of operating personnel.

Before operating the machine, the operating personnel must carefully read the operating manual and acknowledge this by signature. Only then may the machine be put into operation.

In addition to these operating instructions, the generally applicable and local rules and regulations on accident prevention and environmental protection must be taken into account and adhered to.

The operator is responsible for the observance of the safety regulations. Prior to putting the machine into operation, the operator must introduce all operating personnel to these safety standards.

It does not contain any motor-driven parts, and therefore there are no operation-related hazards for the life and safety of the operating personnel.

The inspection doors allow no direct access to the discharge unit.

Maintenance and service openings must only be opened while the entire machine is stopped.

Caution!

1.2 EU standards and national regulations for prevention of accidents

The multicon sifter has been designed according to the following European and German work safety and legal requirements:

- 98/37/EG European Machine Directive with amendments
- 73/23/EWG EU low voltage directive

Following harmonised standards are applied:

- DIN EN ISO 12100 Safety of machinery, equipments and plants
- DIN EN 292 Safety of machinery - Basic concepts, general principles for design
  Part 1 Basic terminology, methodology
  Part 2 Technical principles and specifications
- DIN EN 294 Safety of machinery, clearance distance against reaching danger points
- DIN EN 349 Safety of machinery, minimum distance in order to avoid crushing parts of the body
- DIN EN 60204-1 Safety of machinery - Electrical equipment of machines (VDE 0113) part 1 generally standards

Following national standards and technical specifications are applied:

Attention to should be paid to these Health and safty at Work Acts.

- VBG 1 General regulations
- VBG 4 Electrical installations and machines
- VBG 5 Power operated work equipment
- VBG 10 Continuous Handling Equipment
- VBG 22 Work machines of chemical industry
- DIN 31001 Safety design of technical products
- 3rd Personal Protective Equipment Regulations

1.3 Sound proofing

The multicon sifter does not emit any significant noise.

2. Technical Data

See dimensioned drawing multicon sifter, type MK 1500/400.

3. Transportation

No special requirements have to be met regarding the transportation of the sifter.

4. Assembly

No special requirements have to be met regarding the assembly of the sifter. It must be screwed on to the base using supporting claws provided for this purpose and it must be secured against slipping.

There are no dynamic loads.

For any assembly work the conditions of the industrial safety regulations regarding

- assembly
- civil engineering
- welding and cutting
- hoist and separate lifting accessories
- regulations on electrical equipment

are to be guaranteed

Important!

5. Scope of Application

The deflection sifter is used to dedust relatively fine materials with a tendency to felt, occurring e.g. during the crushing of electronic scrap. The objective is to separate the fine metal particles contained in the flow fraction from the fine dust so that the metal accumulates and posttreatment becomes possible.

6. Operating principle

The sifting is based on the principle of cross-flow and up-current separation. The material sucked in via the feed shaft is deflected at the central input connection inside the sifter. It is distributed sideways via a central distribution cone. Simultaneously, air is sucked in from the outside via a scavenging air valve, flowing through the material centrally from the bottom. Dispersible light material is entrained by the upward air current and separated in the subsequent filter. The expansion of the sifting area towards the top reduces the higher air velocity acting in the lower part of the sifter as it reaches the upper part of the sifter. This causes light material entrained in the beginning to drop down again at the sifter walls. In the lower part of the sifter it will be purged with scavenging air via a lateral belt of ports, which can be adjusted by means of a rotary valve. The scavenging air separates further fine particles from the light material to be carried away by the sifting air. This interaction of different air currents and vortexes inside the sifter together with the zigzag walls of the sifter housing leads to strong material circulation and contact. Material tending to felt such as e.g. coil wire or foils can thus get caught in each other to be discharged as felted material, because it can then no longer be entrained by the air.

Material discharge positions can be sucked off at low dust emissions via the intake sockets of the air distributor rings. Ensure that coarse dust is not sucked in, since it could clog the air distribution ring.

In conjunction with the large sifter volume and the large throughput of air it is possible to largely dedust even hard to sift products, to separate the fine metal contents and to discharge them with the heavy material.

The sifter settings depend on the material and must be experimentally determined.

7. Initial operation

Upon initial operation:

- Open the multicon sifter and check for foreign matter
- Check the central distribution cone for a tight fit

Switch-on sequence:

1. Switch on suction
2. Switch on discharge
3. Switch on material supply

Switch-off sequence:

1. Switch off material supply
2. Switch off discharge
3. Switch off suction

8. Maintenance and overhauling

Sifter maintenance is limited to daily checking of the sifting area for caking via the provided inspection doors. It is particularly important to check the 3 inner fastening tubes of the central distribution cone for sediments caused by felted material. Sediments are to be removed with a stick and discharged by means of the discharge unit to be switched on. Larger sediments should be avoided, since they can block the discharge unit.

The sifter's feed pipe must be periodically checked for wear, so that it can be replaced in time.

9. Error Analysis

Error	Possible Cause	Remedy
No material discharge	Clogging inside classifier	Open housing, remove clogging
	Discharge unit blocked	Clean discharge unit
Poor classification results	Suction too weak	Check suction
	Air addition slide valve altered	Check air addition slide valve
	Too much feed material	Reduce amount of feed material

10. Notes about the acquisition of spare parts

This operating manual contains a drawing and lists of spare parts for the purpose of identifying spare parts. With each order, please include the type of machine, order number, machine number and the position of the spare part. This will help us supply the desired parts more quickly.

Company address:

ReTek Goslar Recycling GmbH
Reußstraße 18
D-38640 Goslar
Tel.: 00 49/(0) 53 21/2 97 03
Fax: 00 49/(0) 53 21/4 02 99

RETEK Goslar
Recycling GmbH

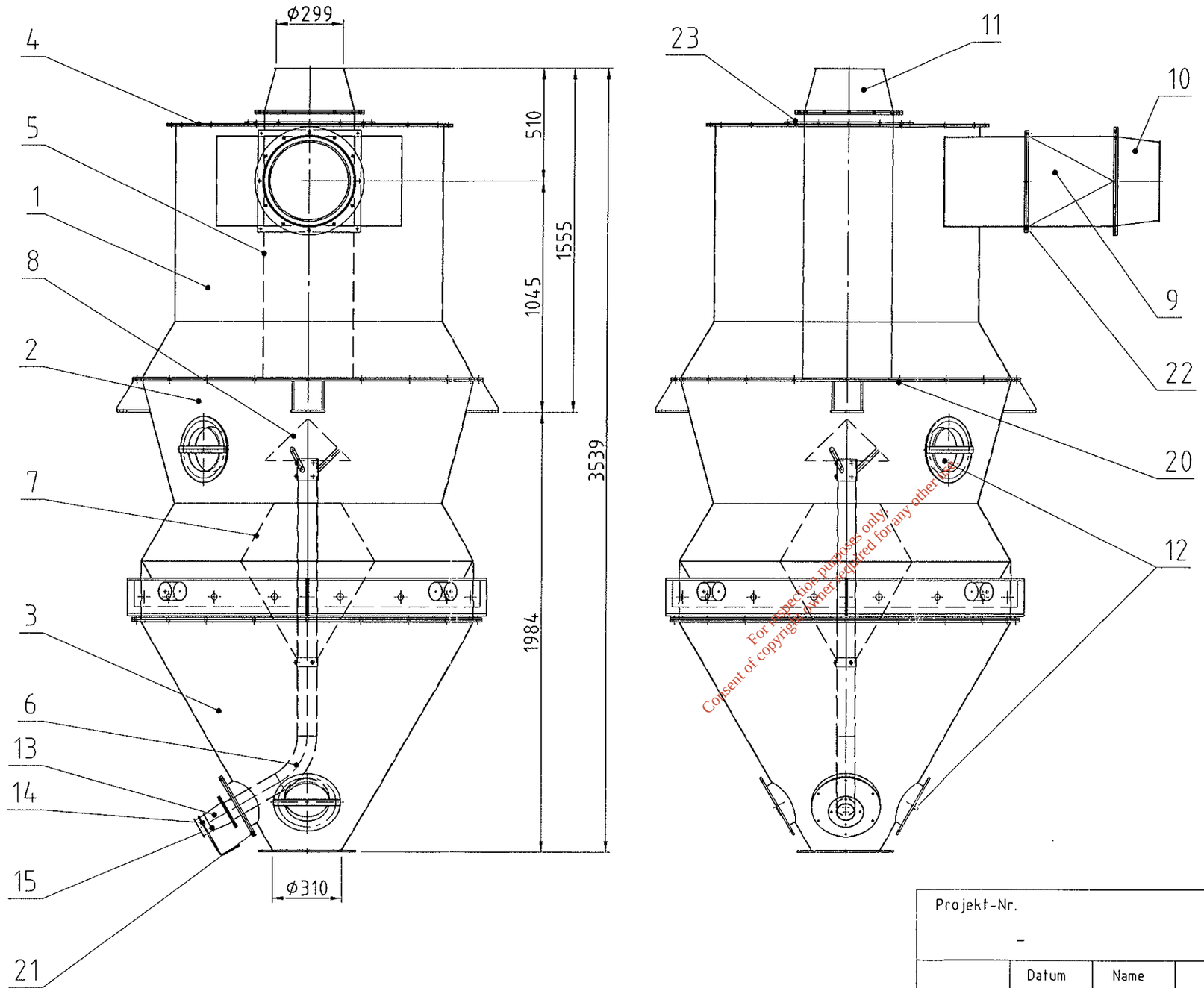
Stückliste

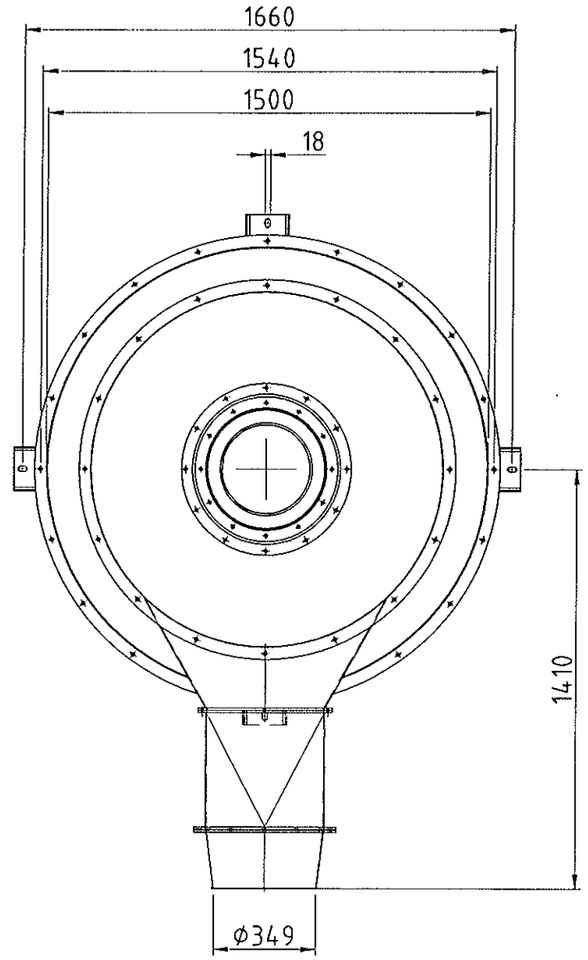
Titel: Multikonsichter Typ: MKS 1500/300				Kunde:			
Sach-Nr.: 30-210-055			Zeichnungs-Nr.: 30-210-055.3	Auftrags-Nr.:			Datum: 09.05.02
Pos.	Sachnummer	Menge	Benennung	kg	Werkstoff	DIN	Zeichnungs-Nr.:
1	20-015-001	1	Gehäuseoberteil	262,6	St37-2		20-015-001.3
2	20-015-101	1	Gehäusemittelteil	536,0	St37-2		20-015-101.3
3	20-015-202	1	Austragstrichter 1500/300	190,2	St37-2		20-015-202.3
4	12-000-607	1	Deckel DN1200/500, Blech 5 x 1280 x 1280	64,3	St37-2		12-000-607.3
5	20-067-161	1	Rohr mit Doppelflansch	44,9	St37-2		20-067-161.3
6	23-002-008	1	Rohrbogen mit Doppelflansch	28,9	St37-2		23-002-008.3
7	23-500-200	1	Doppelkonuseinsatz D = 500/100-260	34,3	St37-2		23-500-200.3
8	20-200-007	1	Abschirmkegel mit Halterung 380/90	4,3	St37-2		20-200-007.3
9	20-076-502	1	Rohrübergangsstutzen 400/400 x 400	23,1	St37-2		20-076-502.3
10		1	Konusstück 350/400	4,4	St		KMH 3521047
11		1	Konusstück 300/400	3,8	St		KMH 3021048
12		4	Gummideckel DN 200	2,4	NR		KMH 20001040
13		1	Konusstück 80/100	0,3	St		KMH 0811047
14		1	Luftregulierschieber DN 80	0,8	St		KMH 0811077

RETEK Goslar
Recycling GmbH

Stückliste

Titel: Multikonsichter Typ: MKS 1500/300				Kunde:			
Sach-Nr.: 30-210-055			Zeichnungs-Nr.: 30-210-055.3	Auftrags-Nr.:			Datum: 09.05.02
Pos.	Sachnummer	Menge	Benennung	kg	Werkstoff	DIN	Zeichnungs-Nr.:
15		1	Spannring DN 80 mit Dichtmasse	0,3	St		KMH 0812055
			Gesamtgewicht:	**1200,6**			
20		56 56 112	Sechskantschraube M10 x 35 Sechskantmutter M10, verz. Scheibe A10,5, verz.		8.8 St St	933 934 125	
21		6 6 12	Sechskantschraube M8 x 35 Sechskantmutter M8, verz. Scheibe A8,4, verz.		8.8 St St		
21		8 8 16	Sechskantschraube M6 x 30 Sechskantmutter M6, verz. Scheibe A6,4, verz.		8.8 St St		
23		12 12	Sechskantschraube M8 x 20 Scheibe A8,4, verz.		8.8 St		





Projekt-Nr. –	Diese Zeichnung darf ohne unsere schriftliche Genehmigung weder kopiert noch dritten Personen zu gängig gemacht werden. Jeder Mißbrauch wird strafrechtlich verfolgt.	
	Datum / Name	RETEK Goslar Recycling GmbH
Gezeichnet	09.05.2002 / M. Gralher	Reußstraße 18 D-38640 Goslar Telefon: (05321) 29703 Telefax: (05321) 40299
Geprüft		
Geändert		
Maßstab 1:20 – –	Benennung: Multikonsichter MKS 1500/300	Zch.Nr. 30-210-055.3
		Datei-Pfad D:\Aufbau\30\30-200 bis 399\30-210-055.dwg

Zeichnung CAD erstellt Änderungen nur über CAD

Table of contents

Preface to operating manual

This operating manual makes the user familiar with

- how the plant works
- how the plant is operated
- the safety instructions
- and maintenance.

Please read the manual through carefully and always act accordingly.

Observing these notes helps to prevent hazards, minimize repair expenses and downtimes and maintain reliability and life.

The instructions are important for staff authorised to erect and operate the machines.

So do not forget to pass the manual on!

Important!

According to the UVV Accident Prevention Regulations, the complete documentation must be kept close to the plant and available to the operating staff at all times.

The machines must only be operated by persons who have been qualified accordingly by corresponding vocational training and additional training offered by the manufacturer.

Important!

The manufacturer is not liable for any consequential damage caused by repeatedly non-conforming functions, conditions or measures which are not documented in the operating manual or which have not been confirmed as in order by the manufacturer.

In addition to these operating instructions, the generally applicable and local rules and regulations on accident prevention and environmental protection must be taken into account and adhered to.

Important

Please do not hesitate to contact us at any time with any questions referring to the operating manual or operation of the plant.

ReTek Goslar Recycling GmbH
Reußstr. 18
D-38640 Goslar
Phone: ++49 (0) 0 53 21/2 97 03
Fax: ++49 (0) 0 53 21/4 02 99

1. Technical data specifications

Tube filter DS/DSL/DSR Side - Removal/Top-Removal

filter type:	DS 1.8/90/65 pred. 1,4 bar	
filter area:	65	m²
number of tubes:	88	piece
length of tubes:	1.830	mm
quality of tubes:	polyestervlies antistatically	
nominal volume of gas:	10.200	m³/h
temperature:	max. 50	℃
max. low pressure:	-50	mbar
resp. overpressure:	1,4	bar (abs.)
kind of dust:	electronic industry waste	
size of grain:		µm
dust load:		kg/h
particle content:	20	mg/Nm³
installation place:		
valve controler:		
controler voltage:		V DC
		Hz
air consumption:	ca. 8	m³/h
dedusting:	6	bar
fan:		
fan motor:		

accessories with discription:

cellwheellock:	V	kW
double swing-flap:	V	kW
difference-pressure-gauge:	V	kW
2/2 way valves 1“		
Druckluftintervallklpfer		
V- trough conveyor		kW

accessories without discription:

.....

.....

.....

2. Conformity Declaration

ReTek Goslar Recycling GmbH hereby declares that the machinery and/or delivered machinery parts herein described are in conformity with the applicable basic health and safety requirements set forth in the EC-Directive on Machinery with respect to their conception, design, and the final product brought to market.
This declaration shall become invalid in the event of a modification to the above-described product that is not approved by us.

We declare that the machinery and/or the machinery part, as herein described:

Tube Filter DS 1.8/90/65 SR pred. 1,4 bar

Order-No.:

conform to the following applicable directives, as amended:

98/37/EC	EC Directive on Machinery
73/23/EEC	EC Low Voltage Directive

The following harmonized standards have been applied:

DIN EN ISO 12100	Safety of machinery, equipment, and systems
DIN EN 292	Safety of machinery—Basic concepts, general principles for design Part 1 Basic terminology, methodology Part 2 Technical principles and specifications
DIN EN 294	Safety of machinery—Safety distance to prevent reaching danger zones
DIN EN 349	Safety of machinery—Minimum gaps to avoid crushing body parts
DIN EN 60 204-1	Safety of machinery—Electrical equipment of machines, Part 1: General requirements (motors)
VDMA 24167 T1	Fan-Safety requirements

First-time operation of the above-described product is prohibited until it is determined that the entire functional machine conforms to the requirements of the directive.
This declaration does not constitute a warranty of properties under the German Product Liability Act.

The safety notes of the product documentation as well as an intended use is to be considered.

Date: 30.05.2001	Manufacturer:	Retek Goslar Recycling GmbH
	Signature:	This form is by machine created and without signature valid

3. Confirmation

under § 5 article 4 of the prevention of accidents-regulation
“Electrical installations and operating resources ” (VBG 4)

To

We confirm that the electrical installation / the electrical operating resource / the electro technical equipment of the machine or installation

Tube Filter DS 1.8/90/65 SR pred. 1,4 bar

Order-No.: 50-

agrees with the regulation of the prevention of accidents (VBG 4).

This confirmation serve exclusive to release the entrepreneur from testing the electrical installation / the electrical operating resources / the electro technical equipment of the machine or installation before the first starting (§ 5, Article 1.4 VBG 4).

Civil law warranty- and liability-claims are not regulated with this confirmation.

Date: 30.05.2001

Manufacturer: Retek Goslar Recycling GmbH

Signature: This form is by machine created and without signature valid

4. Safety

4.1 Generally applicable safety notes

The tube filter has been produced according to the acknowledged rule of technology. The latest safety standards have been applied, thereby eliminating all work-related hazards for the life and safety of operating personnel.

Before operating the machine, the operating personnel must carefully read the operating manual and acknowledge this by signature. Only then may the machine be put into operation.

The operator is responsible for the observance of the safety regulations. Prior to putting the machine into operation, the operator must introduce all operating personnel to these safety standards.

4.2 Work safety

It does not contain any motor-driven parts, and therefore there are no operation-related hazards for the life and safety of the operating personnel.

4.3 Sound proofing

The tube filter does not emit any significant noise.

5. Transportation

If the transportation of the filter is horizontal, (Line DS + DSR), check the position of the filter tubes within the bottom of the tube during initial operation. If necessary, unfasten the transportation lock in the clean gas cage (bottom line filter tubes).

6. Initial Operation

The indicator for differential pressure has to be adjusted to the zero line by the setting screw.

The opening for dust delivery has to be closed together (if not been done by cellular wheel sluice or else) The filter should be set to work according to the following consecutive sequence:

1. dust delivery part
2. compressed-air dedusting
3. main ventilating fan

The above mentioned aggregates have to be interrelated according to the consecutive sequence.

During the first days of operation the indicator for differential pressure has to be supervised exactly. It indicates the pressure difference between crude gas unit and clean gas

unit. The resistance is a measure for correct working of the filter and shouldn't essentially surpass the early-mentioned resistance of the filter.

With new filter cloth resistance will first be inferior before it is slowly increasing. Steady condition is reached after some hours at the earliest and sometimes only after some days until the primary, permanent filter bed has developed completely.

By reason of the inferior resistance the main ventilating fan first accepts a higher air volume than normally. The accumulated dust possibly penetrates too deep into the filter medium, and it is eventually no longer usable.

Therefore the main ventilating fan has to be choked during run-in. It is necessary to meet the max. air volume assigned for the installation as exactly as possible. Initial choking likewise protects the fan from an excessive drawing of current.

In order to shorten the holding of the filter cloth the compressed-air dedusting can first be adjusted to extreme dead-time (200 s) and shortest pulse (0,5 sec.). As soon as the filter cloth resistance has reached a setting value, first the pulse time is lengthened by degrees. Should the differential pressure fall thereupon, the pulse time is again shortened a little.

In case the differential pressure keeps rising, the interval time has also to be shortened. On diminishing the interval time it has to ensured that the compressed-air reservoir is filled.

Stand still at manometer of attendance unit!)After each regulating 2 – 4 hours are required to reach the new steady condition. The process has to be iterated until a constant working order to the amount of the setting value is achieved.

We recommend to ask for our specialists for the initial operation of the system.

Important!

The gear motors for additional actuation may be from different producers. Please consider the attached maintenance instructions. Usually it is efficient to keep free the cooling air ways of the motors and to check the bearings.

7. Initial Operation for the micro filtration

1. Before initial operation, please check the fit of the filtering jig and also test it for leaks for transportation and assembling reasons.
2. Because of the clean tube resistor, the rated air flow has to be adjusted at every filter system, otherwise a filter overloading occurs and the filtering material can be damaged.

   The initial resistance of the new filtering material is < 1 mbar.
3. With grinding products in the near mash material of < 5 µ, ungrounded product is to be coated as primary coat to a certain filtering resistance of about 4 mbar.

   Fresh grinding product is not to be inserted until then.

4. At a tolerance mineral size class, e. g. 90 % at 10 µ, it is to start with a coarse grain spectrum.
5. A radial ventilator, which is topped to the filter, is to be adjusted precisely with the air of the grinding and the air of the injector.
6. A new radial ventilator with felt ring sealing at the shaft exit to the case, is able to exhaust max. 5 – 7 % leakage air.
7. During initial operation the pause time of the filter dedusting has to be adjusted to the filter resistor.

   Adjust the top working point at 5 – 8 mbar at a difference pressure dedusting.
8. Filter differential pressures between 10 – 12 mbar are in the normal range.
9. In case of non-compliance of our commissioning instruction, any warranty expires.

8. Working at the filter

8.1 Installation and change of tube – TOP REMOVAL

The installation of tubes is conducted through the clean gas cage. For that purpose it is necessary to open the filter door or rather the Toro spherical head.

Please mind that the outer grounding is detached.

Caution!

The blast pipes, lodged to the bottom sheet or rather sheet casing have to be dissembled. Because of the staggered rows of tubes it is essential to observe the sequence of disassembly.

For Filters with electrical link it is necessary to remove the skinner of the clamp (picture 1).

Now pull the injector nozzle out of the holding device of the cage injector tool slanting to the top (picture 2).

Then the supporting case has to be pulled out of the filter tube straight and slowly(picture 3). Please never remove the filter tube and the supporting cage at the same time, neither remove it slanting.

Lastly, pull the filter tube (picture 4) out of the bottom of the tube approx. 10 cm, compress it (picture 5) and pull it out slowly and slant to the top without letting the filter tube drag at the bottom of the tube.

To insert the new filter tube into the bottom of the tube, compress the filter tube at the bottom (picture 5). Then insert it without touching the bottom of the filter. (picture 6, filter tube inserted correctly)

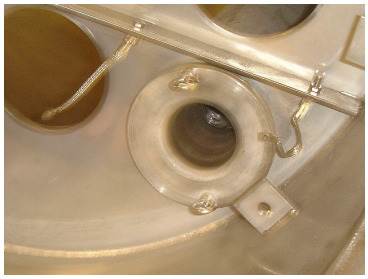
Then insert the supporting cage into the filter tube. Please do not insert the filter tube and supporting cage at the same time.

Now press the injector nozzle with the ring collar into the retainer on the one side (picture 7), and then you press in the other side as well (picture 8). In case it is too hard to handle by hand, please use a rubber mallet. Do not use the feet in any case.

For Filters with electrical link it is necessary to attach the skinner onto the clamp on the injector nozzle (picture 1).

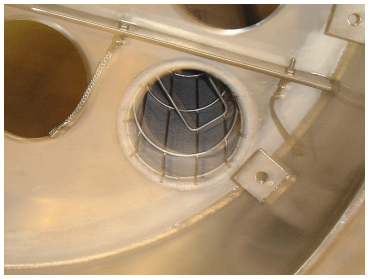
The blast pipes have to be assembled sequencing again, the filter door or Toro spherical head are to be closed and locked. The outer grounding has to be reattached.

In case dust deposits occur at the bottom of the filter in the clean gas cage, please check if all tubes are installed properly. If this is the case, the tube clothing is defective and a change of tube has to be made.

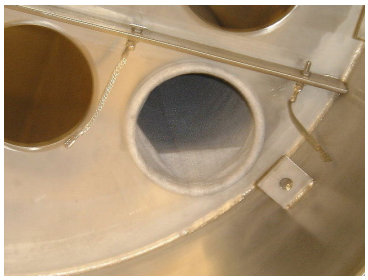


picture 1

picture 2

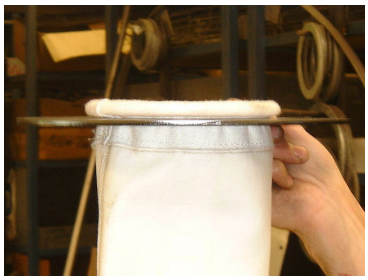


picture 3



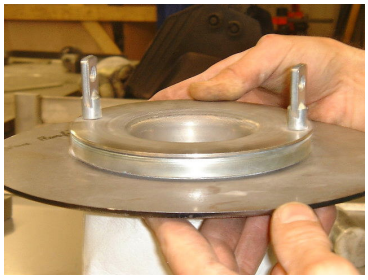
picture 4

picture 5



picture 6

picture 7



picture 8

The following operations have to be conducted:

a. switch off the main fan
b. Open the filter door
c. remove blast pipes
d. pull out injector nozzles
e. pull out supporting cage
f. pull out the tube
g. assemble new tube

Remark:

In case the defective tube shall not be pulled out sidewise, it is possible to put it in the row gas cage as well. In this case, pull out the tube approx. 10 cm, turn the stitched thrust ring parallel to the bottom of the tube, conduct the break in the thrust ring to the edge of the bottom of the tube and extrude the tube.

8.2 Installation and change of tube – SIDE REMOVAL

Installation and removal of tubes is to be done through the crude gas cage. It is necessary to open the filter door or rather Toro spherical head.

The filter tubes, which are mounted to the bottom of the tube through hose clips, should be removed as follows.

Unfasten the hose clips and dismantle the filter tube inclusive supporting cage through light canting downward.

When mounting, the supporting cage is to be installed into the filter tube. The filter tube, which projects on top, is to be turned down into the supporting cage. Attach both parts onto the holder of the supporting cage through hose clips until the supporting cage snaps in.

Fasten tight the hose clip again.

For Filters with electrical link it is necessary to attach the clamp onto a skinner of the cage.

In case dust deposits occur at the bottom of the filter in the clean gas cage, please check if all tubes are installed properly. If this is the case, the tube clothing is defective and a change of tube has to be made.

The following operations have to be conducted:

a) switch off the main fan
b) open the filter door
c) pull out the tube
d) pull out supporting cage
e) assemble new tube

8.3 Failure of dedusting

Shown by increased differential pressure at display unit:

1. Check if delivery part works correctly and if filter is empty.

   In case of choking or defect of a delivery part the whole filter can get choked, and it has to delivered from dust, either to be done by a working delivery part or if need be by manual evacuation. Sulzequently let the filter run without dust admission for some time and dedust. Then start again.

2) Check if control system works.

   The air blast of dedusting is well audible, the last dedusted valve is visualized by a flashed up cipher at the controlling apparatus. In case the electric pulse fails, the controlling apparatus is defective.

3) Check if pressure-air is available and not blocked.

4) Check if the diaphragm valves are mechanically defective. In case pressure-air escapes permanently (constant hissing at the pressure-air tank), the diaphragm is probably defective.

   Blow off the pressure-air tank and unscrew the valve bonnet.

   The diaphragm can be changed then.

   If is essential to take care of the correct position of the overflow outlet in the diaphragm and the correct position of the metal plate.

   On installing the diaphragm tighten the fastening screws equally.

8.4 Maintenance

The display unit for differential pressure has to be read off in constant intervals (once a day). In case the differential pressure shows larger differences, search for the cause of trouble.

Delivery parts (swinging flaps, cellular wheel sluices or delivery worms) have to be checked with regard to perfect function.

At the same time it is necessary to check the pressure capacity and the water capacity of maintenance unit pressure-air.

Once a month the filter tubes have to be verified. The tube bottom can either be examined in view of signs of dust. Considerable depositing of dust indicates a defective cloth, and it is necessary to change the tubes (see point1.)

The main ventilating fan has to be switched off for that purpose!

Caution!

8.5 Filter dedusting

Compressed-air streams through attendance unit “A” into compressed-air reservoir “B” and to the servo diaphragm-valves “C”, which are worked by electricity. By short-time deaerating (variable at controlling apparatus “D”) the diaphragm rear side from 0,05 – 1 s, a push of compressed-air penetrates into the connected row of tubes “E”, and it is dedusted by this means.

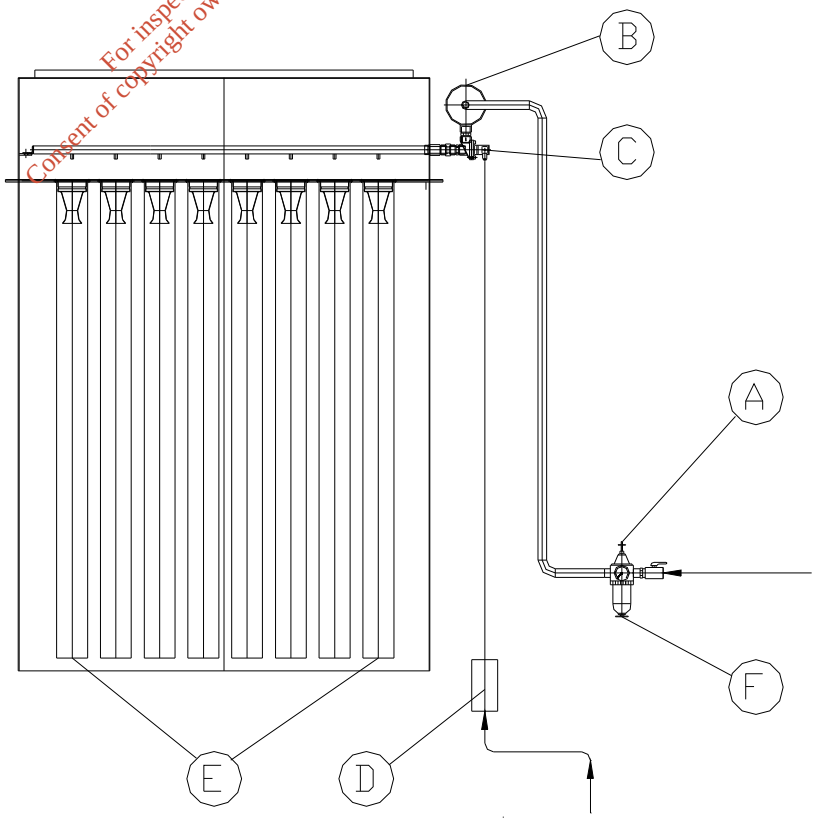
The other valves follow successively in variable periods (5 – 200 s). After the last valve dedusting begins a new. The valve moved in each case is recognizable by the flashed-up number at the controlling apparatus.

Filter dedusting needs a line pressure of 5 – 6 bar for perfect function. The supply line has to be connected to the attendance unit.

Once a week it is necessary to let the condensation water off the compressed-air reservoir.

Safe and con Safe continuous-working is only guaranteed with clean compressed air, free from

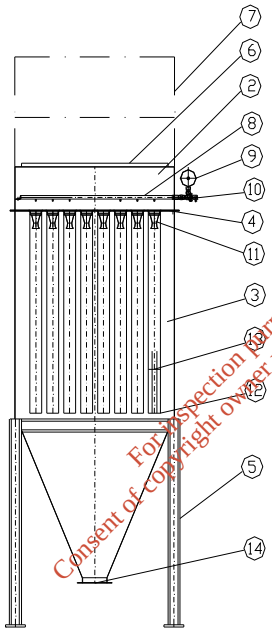
Important!



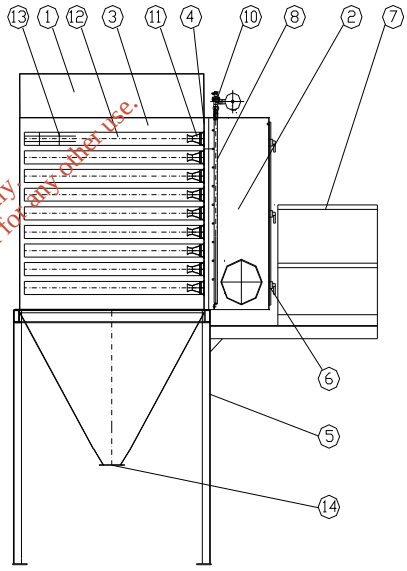
9. Filter construction

1. Dusty air hood (for DSL version only
2. Clean gas channel
3. Filter housing
4. Filter bag bottom
5. Supporting frame
6. Filter door (for DSL and DS version only)
8. Blowpipes
9. Compressed-air vessel
10. Diaphragm valves
11. Dedusting nozzle
12. Filter bag
13. Supporting basket

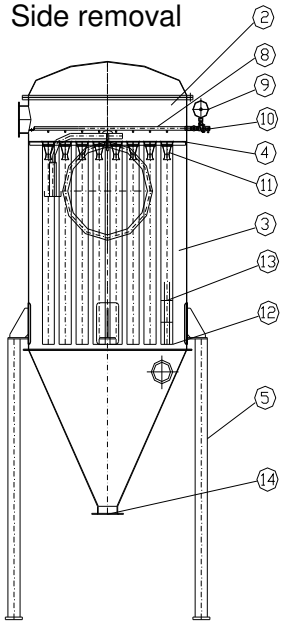
Bag filter type DSL



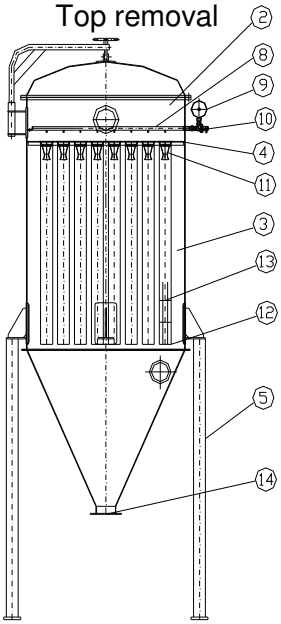
Bag filter type DSL



Bag filter type DSR
Side removal



Bag filter type DSR
Top removal



10. Notes about the acquisition of spare parts

This operating manual contains a drawing and lists of spare parts for the purpose of identifying spare parts. With each order, please include the type of machine, order number, machine number and the position of the spare part. This will help us supply the desired parts more quickly.

Company address:

ReTek Goslar Recycling GmbH
Reußstraße 18
D-38640 Goslar
Tel.: 00 49/(0) 53 21/2 97 03
Fax: 00 49/(0) 53 21/4 02 99

Spare parts list:

		Article no.	
Pos. 1	88 pieces	antistatic	Filter tubes 550/200
Pos. 2	88 pieces	50.057-03	Supporting cage
Pos. 3	8 pieces		2/2- way valves 1”
Pos. 4	88 pieces	50.043-01	Venturi nozzles SR
Pos. 5	88 pieces	50.046-01	Hinge bolt clip
Pos. 6	88 pieces	50.074-02	Ring SR, needled felt
Pos.7	1 piece	50.066-01	Pressure difference indicator
Pos.8	1 piece		Timer AF 12
Pos.9	1 piece	50.0104-01	Bursting disk 590 x 490

11. Manometer type *LFR-D-MIDI 1/2 LFR-D-MIDI ½*

Fitting and commissioning to be carried out by qualified personnel only in accordance with the operating instructions. These products are specifically designed for compressed air use only. Use with any other fluid (liquid or gas) is a misapplication.

Important!

11.1 Application

The LFR-D-MIDI adjusts the incoming compressed air to the set working pressure and compensates fluctuations in pressure.

The LFR-D-MIDI with water separator frees the compressed air of dirt particles and condensed water.

11.2 Conditions of use

These general conditions for the correct and safe use of the product must be observed at all times:

- Please observe the limits for pressures, forces, torques, masses and temperatures.
- Please observe the prevailing ambient conditions.
- Please comply with national and local safety laws and regulations.
- Slowly pressurize the complete system. This will prevent sudden uncontrolled movements from occurring.
- Unauthorized product modification is not permitted.

11.3 Fitting

- Use shut-off valves for making the system pressure less for fitting and maintenance (e. g. when changing the filter).
- Please note the direction of flow. This is shown by the arrows.
- Allow sufficient space below the filter bowl (at least 100 mm) to replace a dirty filter element.
- Adjust the LFR-D-MIDI when it is standing upright (±5%).

Fitted in the fixed tubing:

- Screw the tubing into the connecting flanges. The threads must be sealed.

Fitting the manometer:

1. Locate the manometer in the existing threaded connector. The manometer seal is attached to the protective packaging of the manometer. The alternative connection is closed with a blind plug.
2. If necessary, replace the blind plug (incl. seal).
3. Tighten the manometer and, if necessary, the blind plug.

11.4 Commissioning

Adjusting the regulator LFR-D-MIDI:

1. Slowly pressurize the complete system.
2. Pull the pressure setting button upwards (away from the housing).
3. Turn the pressure setting until the desired pressure is shown on the manometer. The input pressure must be at least 1 bar greater than the output pressure.
4. Press the pressure setting button downwards (towards the housing) to secure it against unintentional turning.

11.5 Maintenance and care

If a condensate level of approx. 10 mm below the filter is reached, open the bleeder screw by turning it in an anti-clockwise direction (see from below). The condensate can than flow out.

With less flow despite same pressure setting, replace the filter element.

1. Exhaust the system and the unit.
2. Unscrew the filter bowl in an anti-clockwise direction.
3. Grasp the new filter element only at the lower end.
4. Refit the parts in the reverse order from dismantling.
5. Recommission as described in the section “Commissioning”.

Cleaning

Use only the cleaning agents specified:

Component:	Filter bowl
Cleaning agent:	Water or soap sud (max. +60 °C); benzine (aromatics free)

11.6 Error Analysis

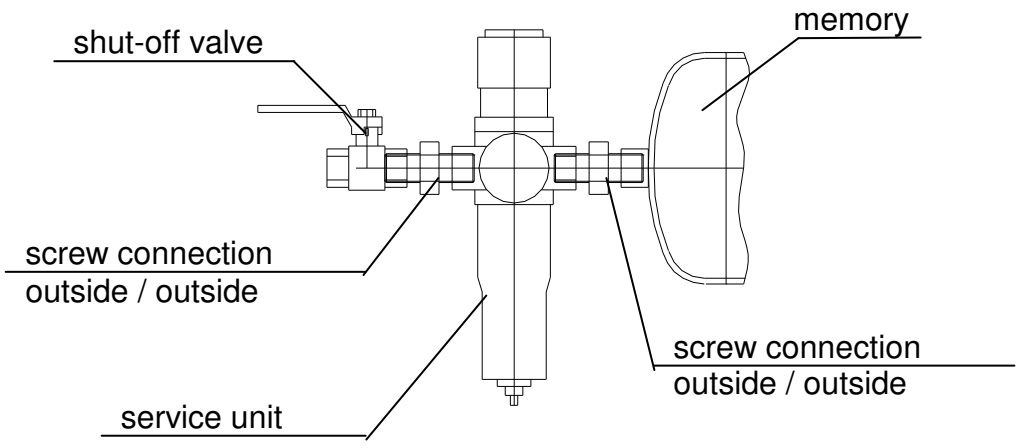
Error	Possible Cause	Remedy
No pressure display	Shut-off valve closed	Open shut-off valve
	Pressure not set	Set pressure with pressure setting button
	Manometer defective	Replace manometer
Low flow (operating pressure fails when compressed air is applied)	Filter element is dirty	Replace filter element
	Restriction between shut-off valve and maintenance unit	Check tubing
Pressure increases above set operating pressure	Defective valve face on sealing seat	Return to Festo
Exhaust can be heard at setting button	Valve seat damaged	Return to Festo
Exhaust can be heard at bleeder screw	Leakage in bleeder screw	Tighten or replace

11.7. Technical specifications

Permitted primary pressure	max. p1:	16 bar (without automatic condensate bleeder) 12 bar (with automatic condensate bleeder)
	min. p1:	1,5 bar
Max. working pressure:		0,5 to 7 bar
range p2:		0,5 to 12 bar
Permitted temperature:		da -10°C...a +60°C (storage, medium, ambient)
Range Fitting position:		standing upright (±5°)
Manometer connection:		G 1/4
Filter fineness:		40 µm
Medium:		compressed air

Materials:

Housing:	GD-Zn
Filter medium:	PE (40µm, 5 µm); micro fibre fabric (1µm and 0,01 µm)
Connection flange:	Al, GD-Zn
Protect cover:	Al
Interior parts:	POM, PA
Seals:	NBR
Bowl:	PC (macrolon)
Knob:	PA



12. Filter Controller Type AF 12

12.1 Product Liability

- Front side of timer is protected against electric shock as specified in VDE regulations.
- Operation and installation only by qualified staff.
- All safety and installation regulations applying to the place of erection must be observed.
- Outdoor installations must only be opened, if protected against rain.
- Even after switching off the device via down time cleaning, the device is still connected to the mains voltage.

Important!

12.2 Technical data

Voltage in	230 V AC
Voltage out	24 V DC
Outlets	12
Fuse	F1 = T 0,4 A
Interval time	appr. 2-30 sec
Pulse time	appr. 40-220 msec
Relais	contact load 230 V AC, 1,0 A
	30V DC, 0,5 A
Ambient temperate	-10^0 C+60^0C
Protection housing	IP 65

Front side of PCB is protected against electric shock as specified in VDE-regulations.

12.3 Electrical connection

Voltage supply has to be connected to terminals as follows.

- N terminal 16
- L terminal 17

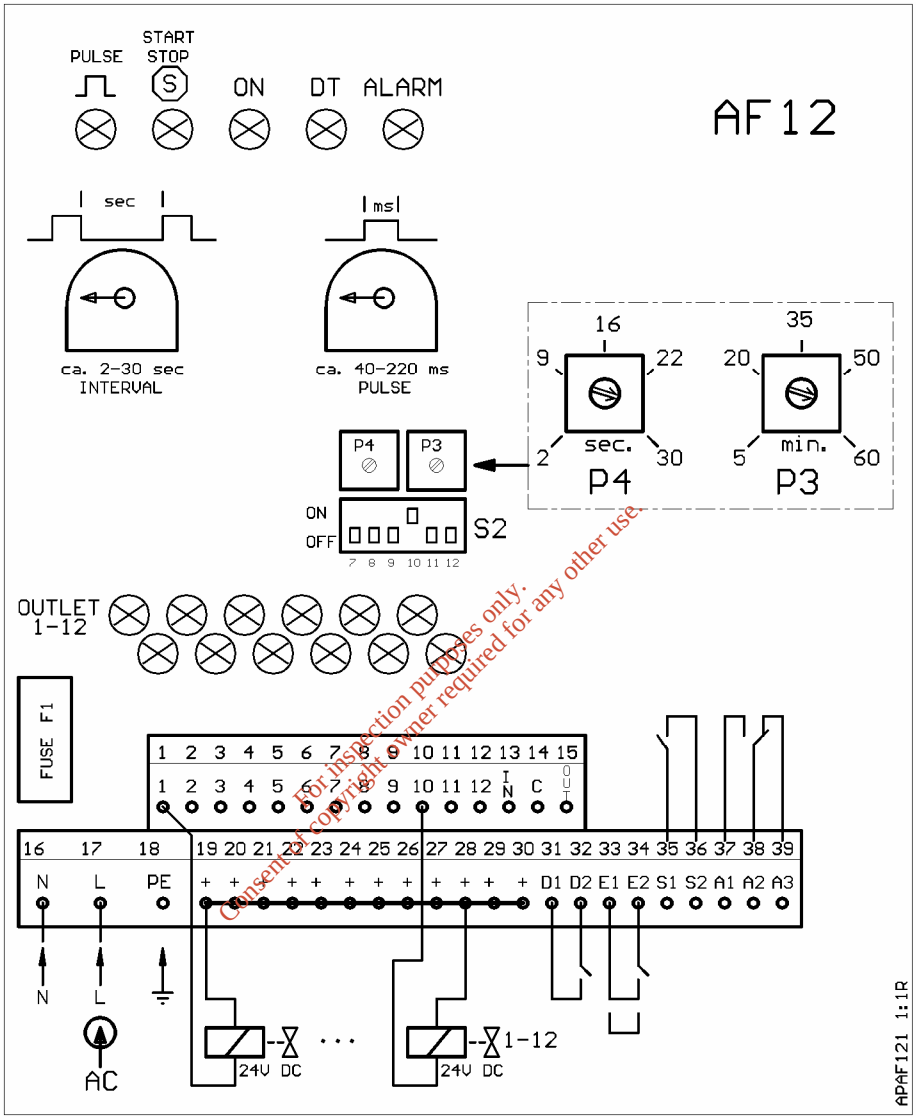
LED marked “ON” illuminates when voltage has been connected to the unit.

Valves have to be connected to terminals 1-12. The common connection of all valves have to be connected to terminal 19-30. Terminals 19-30 are bridged an PCB.

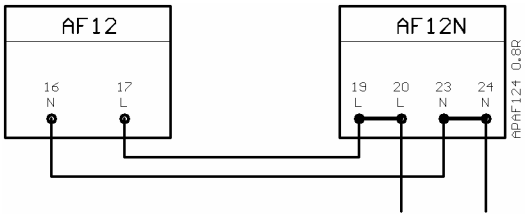
When operation with less than 12 valves is required, use reset-switch S2 from 7 to 12 valves.

If for example 10 magnetic valves are in use, set No. 4 of reset-switch to ON-position (up). The rest remains in OFF-position (down). Only 1 switch is allowed to be in ON-position.

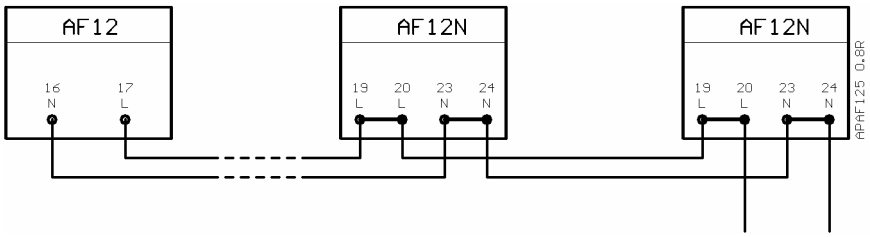
Connecting plan



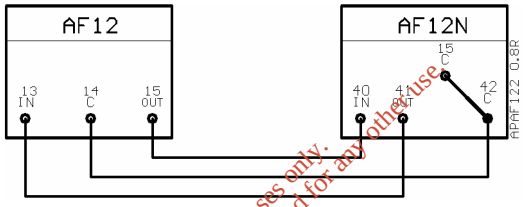
Voltage supply with one AF2 and one AF12N



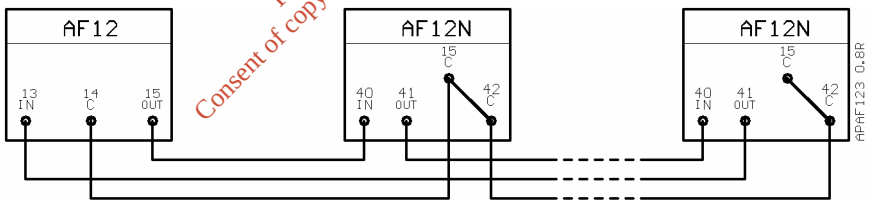
Voltage supply with one AF12 and several AF12N



Datalines IN, C, OUT with one AF12 and one AF12N



Datalines IN, C, OUT with one AF12 and several AF12N



1. Starting with first unit always connect OUT to IN. OUT of the last AF12N back to IN of the first unit (master AF12).
2. All C-terminals have to be connected (15 and 42 of F12N are bridged on PCB).

Important!

12.4 Control times

Timing of the control unit can be set by using the potentiometers PULSE, INTERVAL.
For correct time setting see filter plant instructions.

Pulse

Potentiometer marked PULSE for setting the cleaning period, adjustable from appr. 14 msec to 220 msec.

INTERVAL

Potentiometer marked INTERTVAL for setting the interval period (cleaning pause), adjustable from appr. 2-30 sec. The outgoing pulse is being shown on the LEDs “OUTLET 1-12”.

12.5 Start/Stop- operation

Using the start/stop-terminals 31/D1 and 32/D2 the cleaning cycle can be stopped on all outlets and be started with the next following outlet.

Terminals

D1 D2 open	-	outlets are active
D1 D2 bridged	-	outlets not active

Only to be operated potentialfree. The stop status is displayed on LED marked S.

12.6 Downtime cleaning

Terminals 33/E1 and 34/E2 can be used to start downtime cleaning after switching off the filter plant.

The time is preset to appr. 20 min. The downtime can be adjusted using the right **trimmer P3**. Range appr. 5-60 min. After switching off the plant and opening terminals E1-E2 downtime cleaning starts.

Downtime cleaning starts even if the control is stopped via start/stop-terminals D1-D2. During the downtime the controller workes by using the preset downtime interval time of the left **trimmer P4**. Range of P4 appr. 2-30 sec.

Terminals

E1-E2 bridged:	-	Control unit is switched on internally
E1-E2 opened:	-	Control starts downtime cleaning

E1-E2 only to be operated potentialfree. E1-E2 is bridged ex works.

Upon completion of the downtime, the control function is switched off. Note that mains is still connected to mains voltage. The downtime is displayed on LED “DT”.

12.7 Data lines

Via control circuit IN, C, OUT the control unit AF12 (master) can serve up to 6 AF12N (slaves), see connection plan.

Alarm LED “AL” and relais contact A1 A2 A3 monitor interval-alarm if the control circuit gets foulty. If a slave unit fails (e.g. fuse defect) the master continues with the next following slave. If an AF12 control is to be used without slave units, terminals IN/13 OUT/15 must be bridged.

12.8 Self-monitoring

The control is equipped with a self-monitoring-module to check the internal voltages of the unit, mains, voltage for valves and internal IC-VCC. In case of defect or disruption of mains the relais contacts terminal 37/A1, 38/A2, 39/A3 changes over.

Terminals

A1 A2 is open until mains applied. A1 A2 closes when mains is applied. A1 A2 is closed until mains is applied. A1 A2 open when mains is applied. If aquipped with a Delta-P-Module the contacts change over on Delta-P-Alarm.

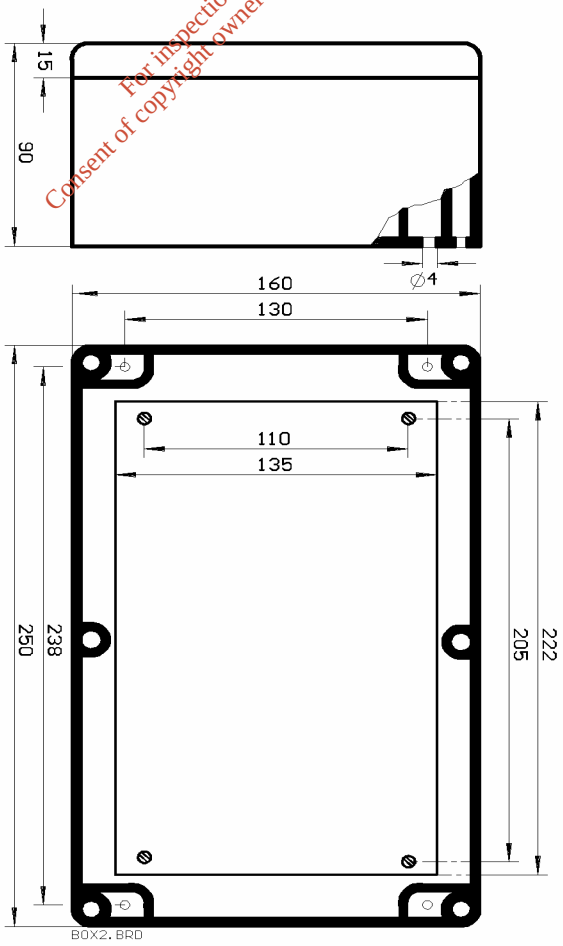
Max. contact load: 230V AC, 1 A, 30 V DC, 0,5 A

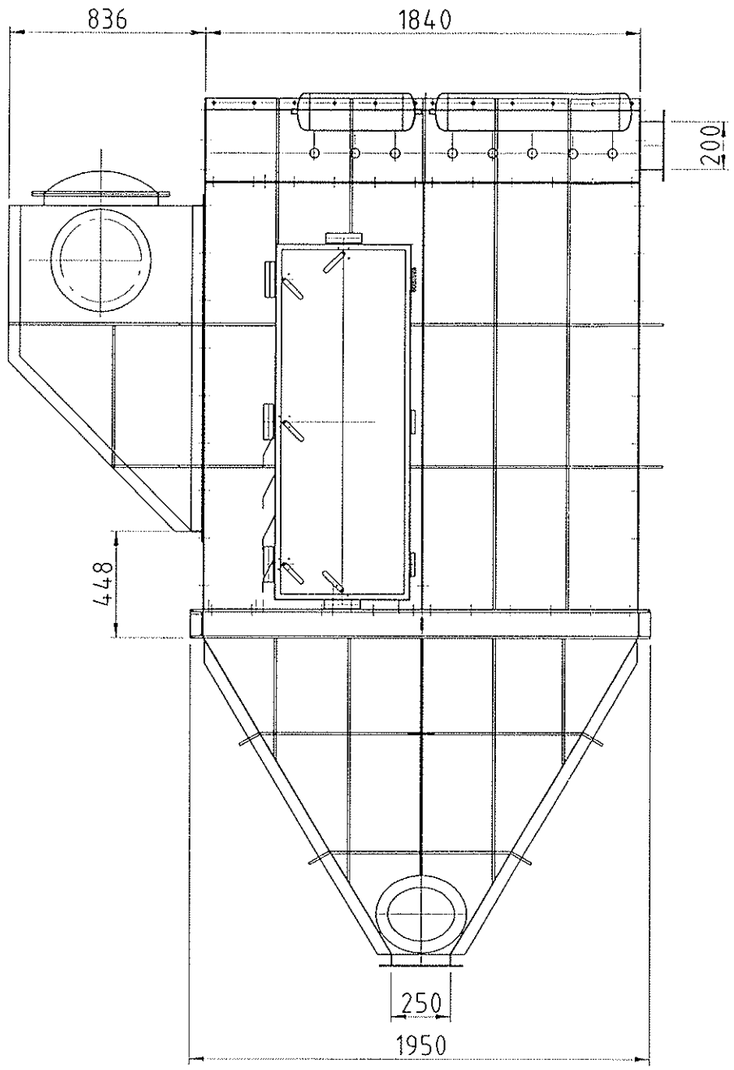
12.9 Terminals discharges unit

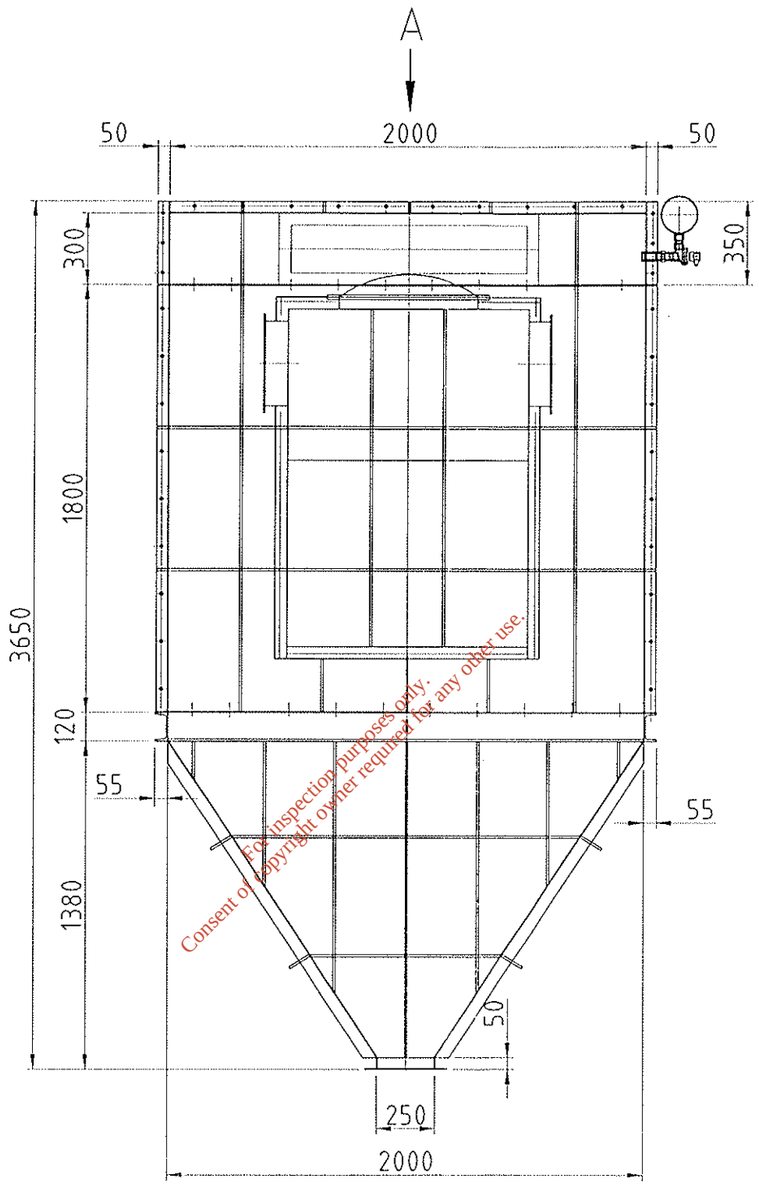
Terminals 35/S1 and 36/S2 provide potentialfree relais contacts for the duration of down-time cleaning. This relais-signal can be used to start the discharge unit.

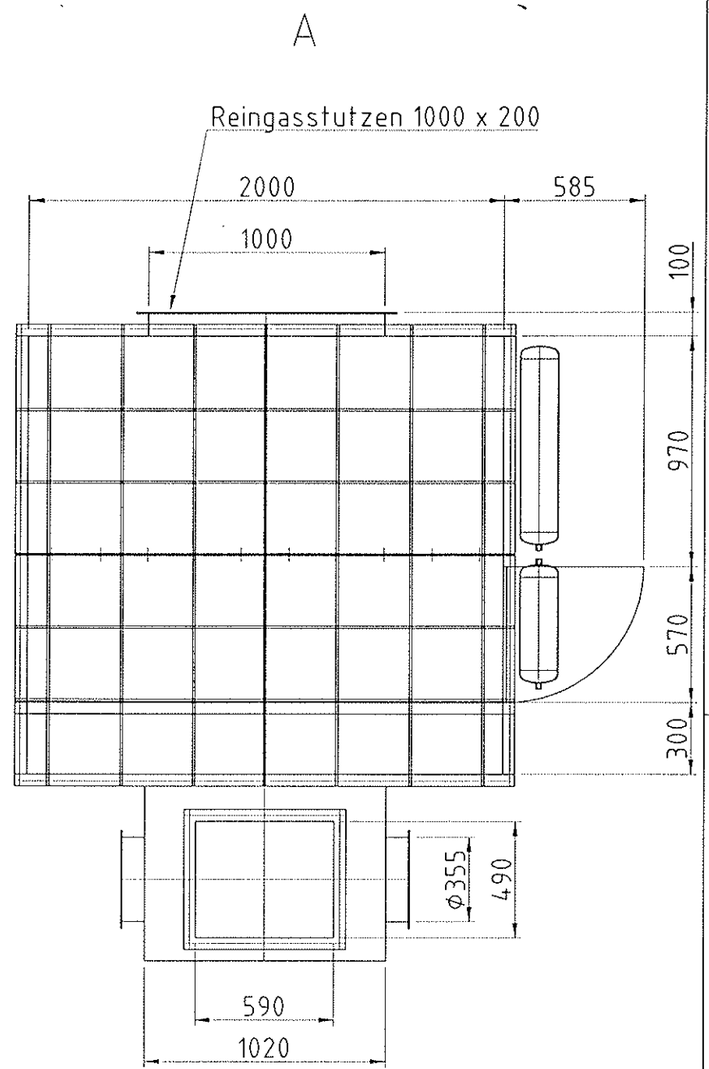
Max. contact load: 220 V AC, 1 A or 30V DC, 0,5 A.

13. Dimensions



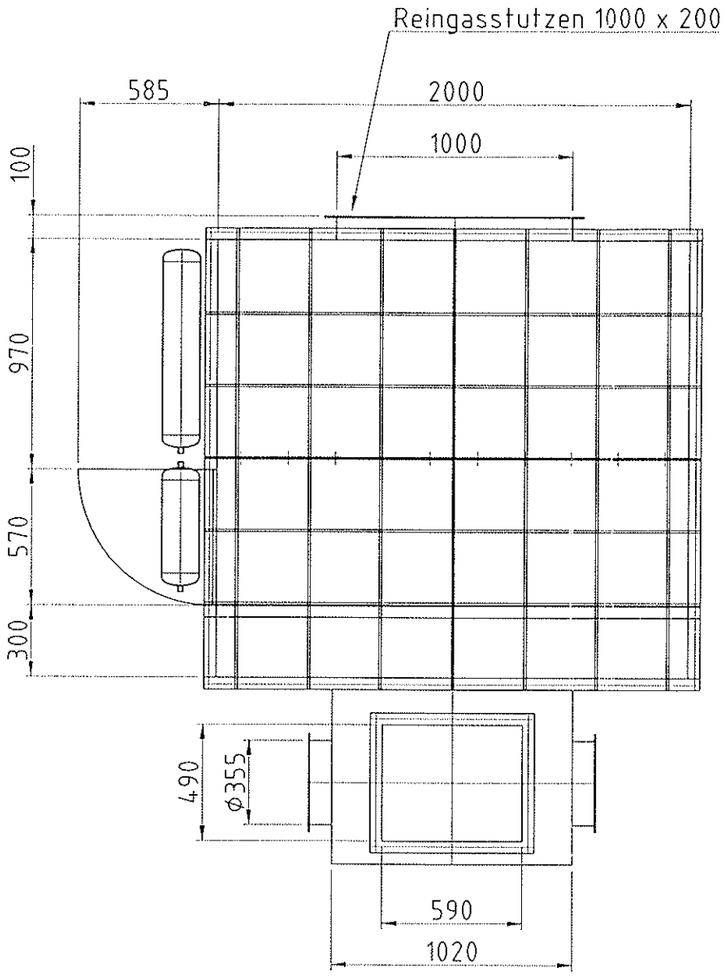


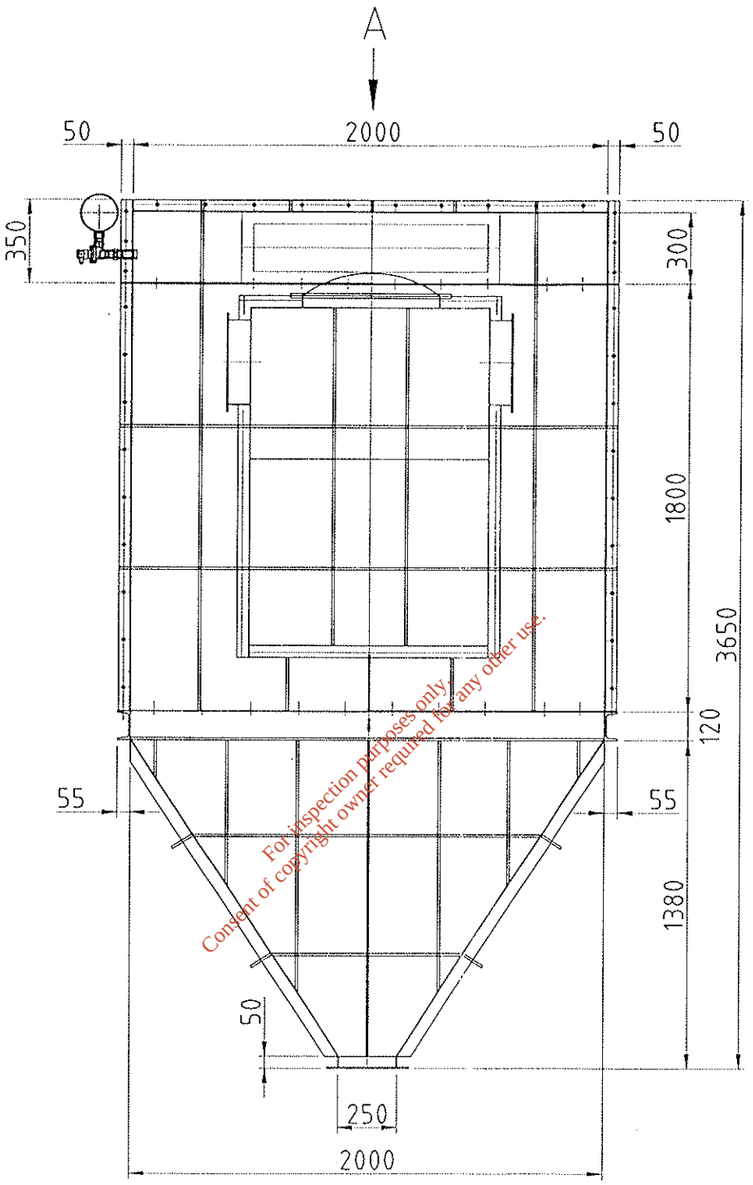


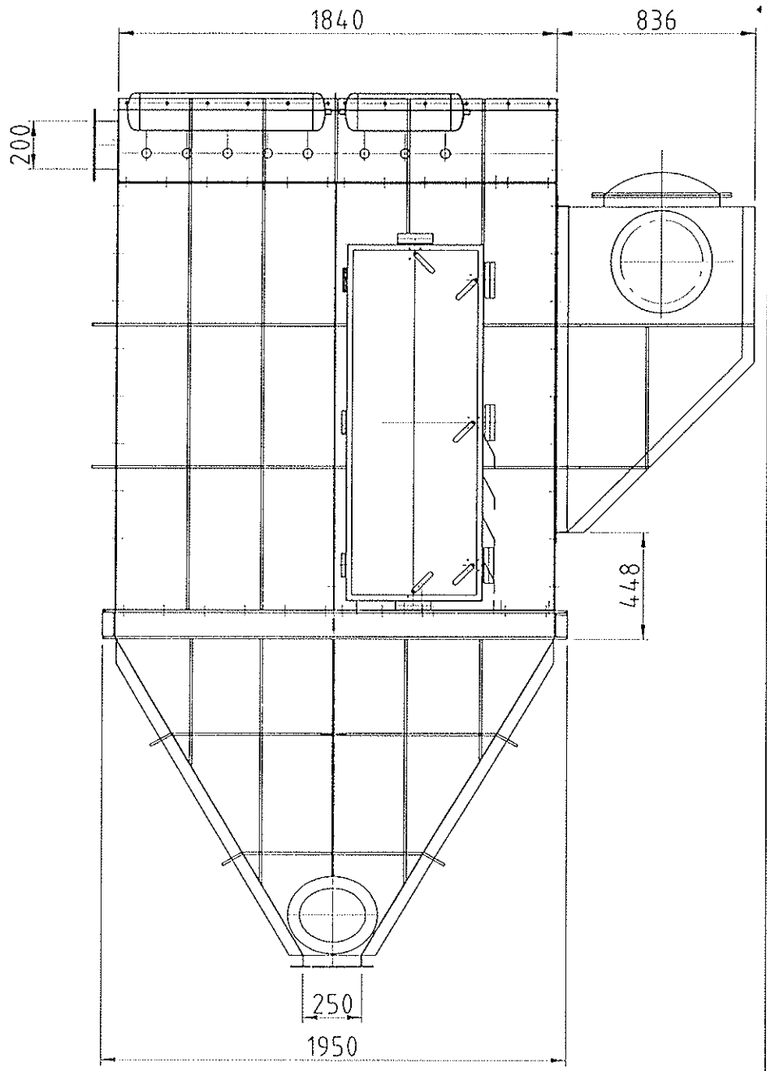


Projekt-Nr. 06/5226/01	Diese Zeichnung darf ohne unsere schriftliche Genehmigung weder kopiert noch dritten Personen zu gängig gemacht werden. Jeder Mißbrauch wird strafrechtlich verfolgt.	
	Datum / Name	
Gezeichnet	21.06.2001 / M. Gralher	RETEK Goslar Recycling GmbH
Geprüft		Reußstraße 18 D-38640 Goslar Telefon: (05321) 29703 Telefax: (05321) 40299
Geändert		
Maßstab 1:25 - -	Benennung: Jetfilter Typ: DS1.8/90/65 Pred. 1,4bar	Zch.Nr. 010.5783-L.3 Datei-Pfad D:\Fremdzeichnungen\Dehne.dwg

Zeichnung CAD erstellt. Änderungen nur über CAD







Projekt-Nr. 06/5226/01		Diese Zeichnung darf ohne unsere schriftliche Genehmigung weder kopiert noch dritten Personen zu gängig gemacht werden. Jeder Mißbrauch wird strafrechtlich verfolgt.
	Datum	Name
Gezeichnet	21.06.2001	M. Gralher
Geprüft		
Geändert		

RETEK
Goslar Recycling GmbH

Reußstraße 18
D-38640 Goslar
Telefon: (05321) 29703
Telefax: (05321) 40299

Maßstab 1:25	Benennung	Zch.Nr. 010.5783-R.3
	Jetfilter Typ: DS1.8/90/65 Pred. 1,4bar	Datei-Pfad D:\Fremdzeichnungen\Dehne.dwg

Zeichnung CAD erstellt. Änderungen nur durch [illegible]

Table of contents

Attachment: Spare parts list and dimensioned drawing Vibrating filter
Drawing no.: 42-001-013.2-
Spare parts list no.: 42-001-013

Preface to operating manual

This operating manual shall make it easier to get to know the machine and to make use of its application possibilities in accordance with the regulations.

This operating manual contains:

1. Important notes on how to operate the machine safely, properly and efficiently.
2. Technical directives, which may not be copied, distributed or used for competitive purposes, neither completely nor in part, without authorization.

Observing these notes helps to prevent hazards, minimize repair expenses and down-times and maintain reliability and life.

The copy rights for this operating manual, which has been handed out exclusively to the customer for personal use, remains with the manufacturer.

1. Safety

1.1 Generally applicable safety notes

The vibrating filter has been produced according to the acknowledged rule of technology. The latest safety standards have been applied, thereby eliminating all work-related hazards for the life and safety of operating personnel.

Before operating the machine, the operating personnel must carefully read the operating manual and acknowledge this by signature. Only then may the machine be put into operation.

In addition to these operating instructions, the generally applicable and local rules and regulations on accident prevention and environmental protection must be taken into account and adhered to.

The operator is responsible for the observance of the safety regulations. Prior to putting the machine into operation, the operator must introduce all operating personnel to these safety standards.

1.2 EU standards and national regulations for prevention of accidents

The vibrating filter has been designed according to the following European and German work safety and legal requirements:

- 98/37/EG — European Machine Directive with amendments
- 73/23/EWG — EU low voltage directive

Following harmonised standards are applied:

- DIN EN ISO 12100 — Safety of machinery, equipments and plants
- DIN EN 292 — Safety of machinery - Basic concepts, general principles for design
Part 1 Basic terminology, methodology
Part 2 Technical principles and specifications

- DIN EN 294 — Safety of machinery, clearance distance against reaching danger points
- DIN EN 349 — Safety of machinery, minimum distance in order to avoid crushing parts of the body
- DIN EN 60204-1 — Safety of machinery - Electrical equipment of machines (VDE 0113) part 1 generally standards

Following national standards and technical specifications are applied:

Attention to should be paid to these Health and safty at Work Acts.

- VBG 1 — General regulations
- VBG 4 — Electrical installations and machines
- VBG 5 — Power operated work equipment
- VBG 10 — Continuous Handling Equipment
- VBG 22 — Work machines of chemical industry
- DIN 31001 — Safety design of technical products
- 3rd Personal Protective Equipment Regulations

1.3 Work safety

Operation of the filter is not permitted, if pipes are not installed or protective equipment has been removed or bypassed.

Wichtig!

Inspection doors must not be opened during operation!

Caution!

1.4 Sound proofing

The vibrating filter may emit some noise. However, it is only operated in intervals and the noise emissions are below 82 dBA.

2. Technical Data

Filter size:	200/36	
Machine number:	42-001-015/0001	
Filter area approx.:	m^2	60
Number of filter hose:	pce.	2 x 36
Length of hoses:	mm	1350
Diameter of Hoses:	mm	200

Quality: PE/NF antistatic

Max. permissible temperature: C^0 $T_{max.}$ 50

3. Filter design

See drawing 42-001-001.2 and piece list.

4. Transportation

No special requirements have to be met regarding the transportation of the vibrating filter.

5. Scope of Application

The filter has been designed for the dedusting of nontoxic dust and gas mixtures. The filter may not be used under conditions (e.g. conveyed medium, conveying temperature, etc.) other than those it has been designed for.

6. Operating principle

Charged at the feed nozzle, the dust and gas mixture is conveyed through pipelines into the filter feed box to be distributed over the hoses. The carrier gas flows from the inside through the filter hoses to the outside, while the dust deposits itself on the inner surfaces of the filter hoses. There, a filter precoat develops, improving the filtering effect. At the same time, however, the filter resistance increases and thus also the pressure inside the filter hoses. The developing dust layer can be cleaned in intervals using a vibrator. The cleaning pulses can be electronically controlled and adjusted to the individual operating conditions.
The dust falls into the discharge hopper and is removed via a discharge unit.

7. Installation and initial operation

Important!

For any assembly work the conditions of the industrial safety regulations regarding

- assembly
- civil engineering
- welding and cutting
- hoist and separate lifting accessories
- regulations on electrical equipment

are to be guaranteed

The filter must be installed in a torsion-proof rack and bolted tightly.

The hoses must be fastened with hose clamps. Make sure the hoses are not twisted and are installed tightly.

The dust outlet (if not already discharged by means of cellular wheel sluice or similar devices) and inspection doors must be closed tightly.

The vibrator motors must be securely bolted according to the manufacturer's specifications.

The filter should be started up in the following sequence:

1. Dust discharge unit
2. Vibrator
3. Main ventilator

The above mentioned units should be interlocked in this sequence.

8. Maintenance and overhauling

The filter must be checked regularly. Check for unusual noise during vibrating phases, which can be caused e.g. by loose screw connections. The filter should be turned off and the problem should be solved immediately to prevent damage.

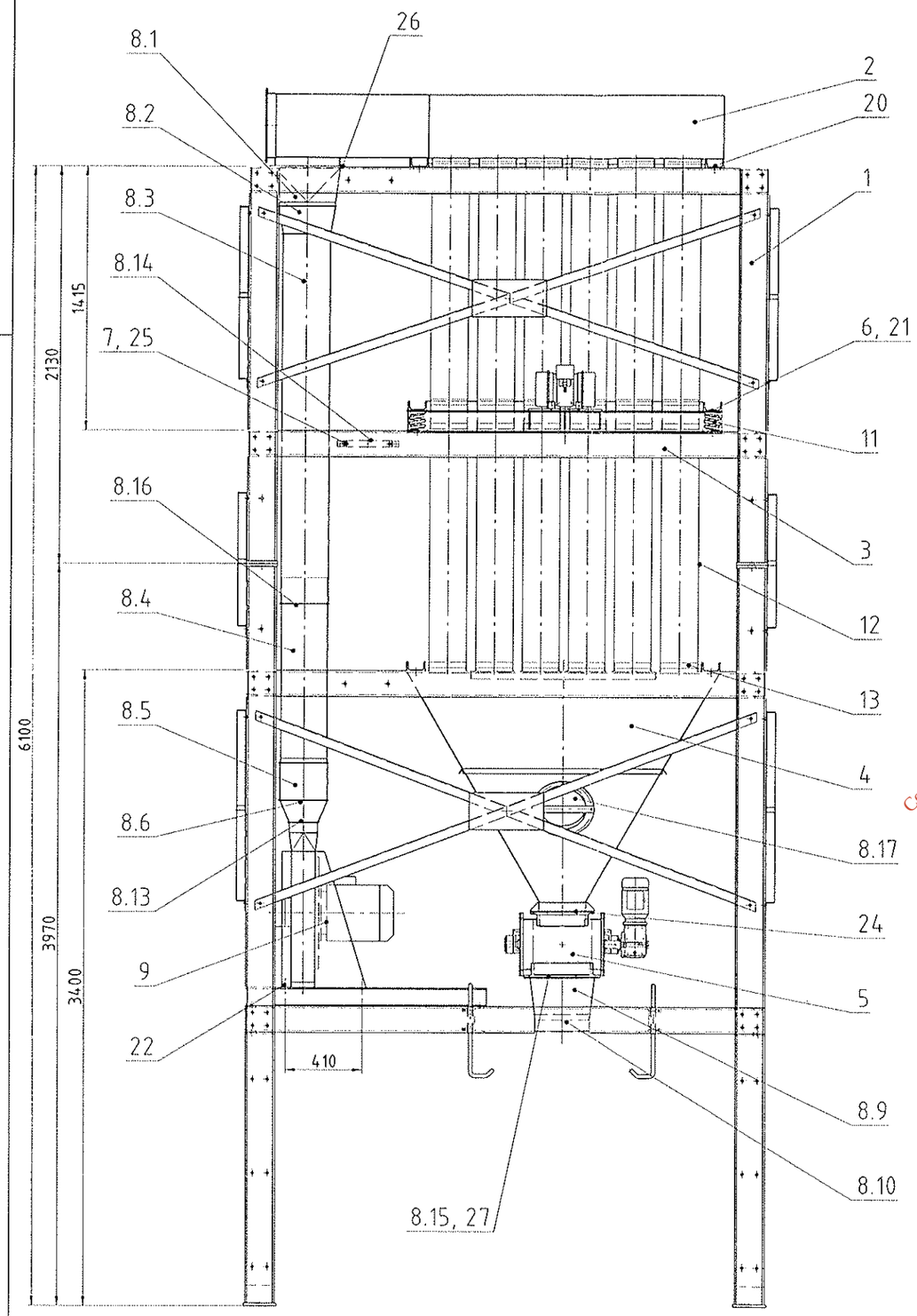
Depending on the operating conditions, the filter hoses may clog up with time and they need to be replaced. To replace filter hoses, loosen the hose clamps, remove the old hoses and install new ones.

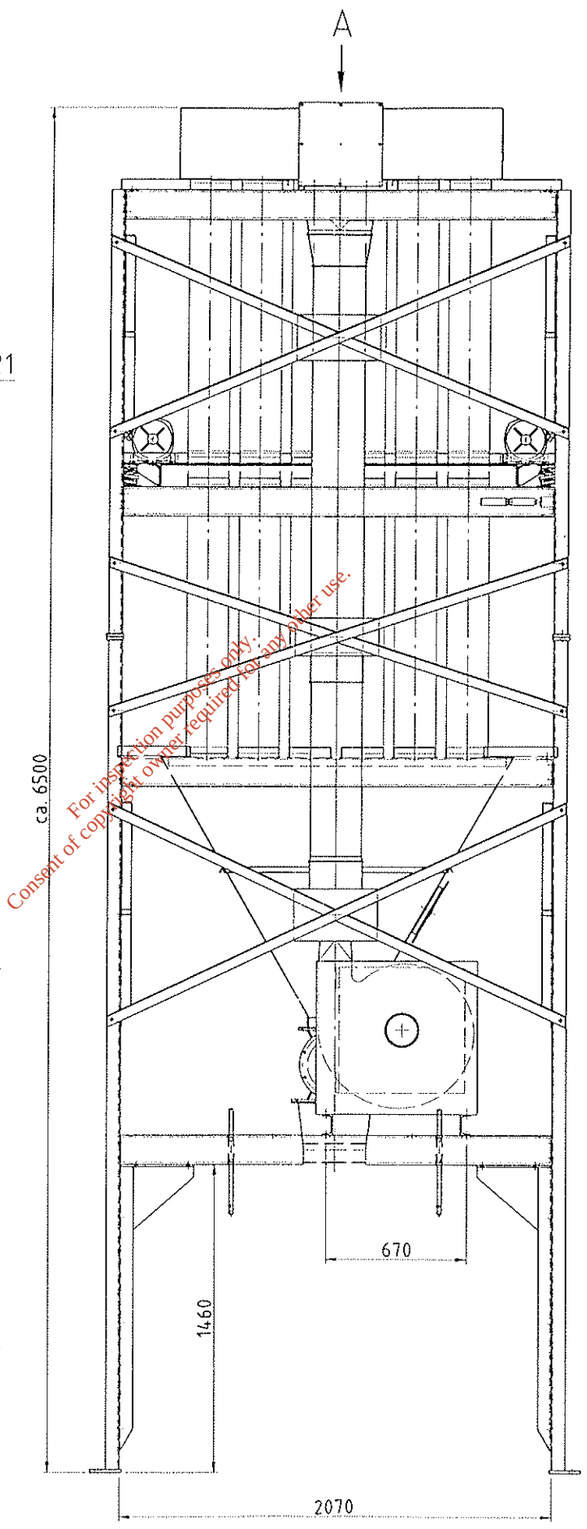
9. Notes about the acquisition of spare parts

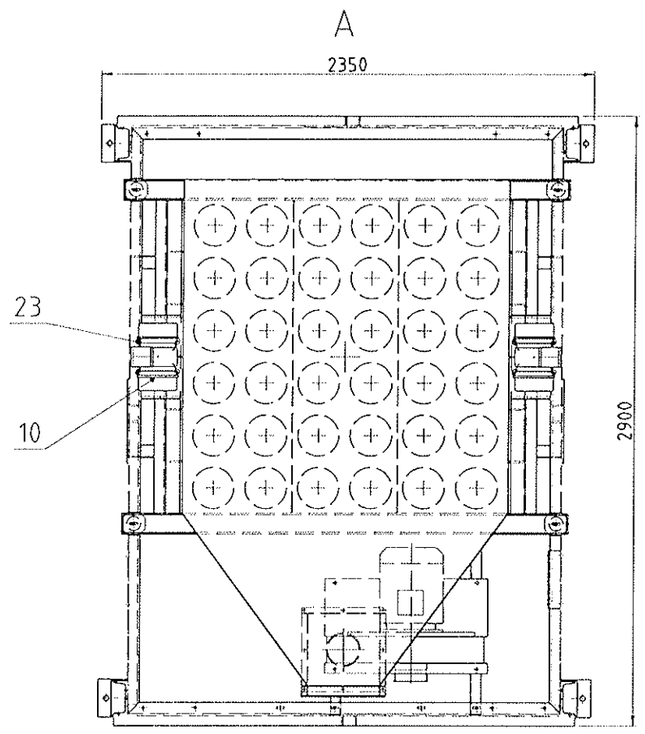
This operating manual contains a drawing and lists of spare parts for the purpose of identifying spare parts. With each order, please include the type of machine, order number, machine number and the position of the spare part. This will help us supply the desired parts more quickly.

Company address:

ReTek Goslar Recycling GmbH
Reußstraße 18
D-38640 Goslar
Tel.: 00 49/(0) 53 21/2 97 03
Fax: 00 49/(0) 53 21/4 02 99







Projekt-Nr.			Diese Zeichnung darf ohne unsere schriftliche Genehmigung weder kopiert noch dritten Personen zu gängig gemacht werden. Jeder Mißbrauch wird strafrechtlich verfolgt.
	Datum	Name	RETEK Gostar Recycling GmbH
Gezeichnet	05.04.2002	Grather	
Geprüft			
Geändert			
Maßstab 1:20	Benennung: Rüttelfilter Filterfläche: 55m2		Zch.Nr. 50-018-170.2
			Datei-Pfad D:\Auftrag\50\50-018-170.dwg

Reußstraße 18
D-38640 Goslar
Telefon: (05321) 29703
Telefax: (05321) 40299

Zeichnung CAD erstellt. Änderungen nur über CAD

Piece list

RETEK Goslar
Recycling GmbH

Title: Vibrating filter 200/36, about 55m²				Customer:			
Sach-Nr.: 42-001-013			Drawing no.: 42-001-013.2	Commisson no.:			Date: 01.04.25
Pos.	**Subject no.**	**piece**	**Denomination**	**Kg**	**Material**	**DIN**	**Drawing no.:**
1	20-041-514	1	steel construction	1.417,4			20-041-514.2
2	20-011-620	1	filterbox 200 x 36	310,8			20-011-620.2
3	20-087-514	1	filternoozle swing frame 200 x 36	335,2			20-087-514.2
4	20-011-682	1	filterbox discharge funnel 200 x 36	345,5			20-011-682.2
5	30-039-243	1	cellar wheel sluice ZRS 250-NR	159,0			30-039-243.3
6	20-083-911	8	spring thorn	5,4			20-083-911.3
7	14-251-001	2	flat steel 50 x 5 x 390	1,5	St37-2	1017	14-251-001.3
8.1		1	transition piece DN 300	7,9	St		
8.2		3	cone DN 250/300	6,9	St		
8.3		1	pipe DN 250 x 200	2,6	St		
8.4		1	fork 30°, DN 250/200/150	6,1	St		
8.5		1	pipe DN 200 x 1000	10,0	St		
8.6		1	insertible pipe DN 200 x 1000	9,2	St		
8.7		1	inspection pipe DN 200	2,7	St		

Piece list

RETEK Goslar
Recycling GmbH

Title: Vibrating filter 200/36, about 55m²				Customer:			
Sach-Nr.: 42-001-013			Drawing no.: 42-001-013.2	Commisson no.:			Date: 01.04.25
Pos.	**Subject no.**	**piece**	**Denomination**	**Kg**	**Material**	**DIN**	**Drawing no.:**
8.8		1	pipe throttle valves DN 200	3,4	St		
8.9		1	cone DN 200/300	2,1	St		
8.10		1	hose coupling nozzles DN250	0,7	St		
8.11		1	fork 45°, DN 250	8,1	St		
8.12		1	bend 45°, DN 250	4,8	St		
8.13		1	cone DN 120/250	1,6	St		
8.14		1	airflow regulator gate DN 120	1,3	St		
8.15		1	pipe DN 150 x 1000	7,5	St		
8.16		1	insertible pipe DN 150 x 500	2,7	St		
8.17		1	segment 30°, DN 150	1,0	St		
8.18		1	rubber cover DN 250	0,9	NBR		
8.19		3	clamping ring DN 300, galv.	1,7	St		
8.20		7	clamping ring DN 250, galv.	3,3	St		
8.21		5	clamping ring DN 200, galv.	2,1	St		

Piece list

RETEK Goslar
Recycling GmbH

Title: Vibrating filter 200/36, about 55m²				Customer:			
Sach-Nr.: 42-001-013			Drawing no.: 42-001-013.2	Commisson no.:			Date: 01.04.25
Pos.	**Subject no.**	**piece**	**Denomination**	**Kg**	**Material**	**DIN**	**Drawing no.:**
8.21		5	clamping ring DN 150, galv.	1,8	St		
8.22		1	clamping ring DN 120, galv.	0,4	St		
8.23		2	pipe clamp for wall fixture DN 250	1,1	St		
8.24		2	pipe clamp for wall fixture DN 150	1,8	St		
8.25		1	ring seal DN 250	0,1	NBR		
8.26		1	ring seal DN 200	0,1	NBR		
8.27		1	ring seal DN 150	0,1	NBR		
9	12-009-501	1	fixing plate, sheet steel 15 x 450 x 700	37,1	St37-2		
10		1	fan MFT 100/300-60Hz power = 13 kW speed 0 3500 rpm position of casing box = GR 360 6000 m3/h, 300 daPa	230,0			
11		1	fan MFT 18/250-60Hz power = 2,2 kW speed 2850 rpm position of casing box = GR 360 1000 m3/h, 250 daPa	65,0			

Piece list

RETEK Goslar
Recycling GmbH

Title: Vibrating filter 200/36, about 55m²				Customer:			
Sach-Nr.: 42-001-013			Drawing no.: 42-001-013.2	Commisson no.:			Date: 01.04.25
Pos.	**Subject no.**	**piece**	**Denomination**	**Kg**	**Material**	**DIN**	**Drawing no.:**
12		2	unbalance motor JV104-50 1500 rpm, 0,4 kW, 400 V, 50 Hz	40,0			
13		4	pressure spring d = 71 x 12 x 120	4,0	St		
14		72	filtering bag d = 200 x 1350				
15		144	hose clip d = 190/210				
			total weight about	3.042,9			
20		8 8 8 8	hexagon head screw M12 x 45, zinc plated hexagon nut M12, zinc plated coarse washer, R14, zinc plated square coarse washer, 14, zinc plated		8.8 St St St	933 934 440 434	
21		8 8	hexagon head screw M12 x 35, zinc plated coarse washer, R14, zinc plated		8.8 St	933 440	
22		4 4 4 4	hexagon head screw M10 x 40, zinc plated hexagon nut M10, zinc plated coarse washer, R11, zinc plated square coarse washer, 14, zinc plated		8.8 St St St	933 934 440 434	
23		4 4 8	hexagon head screw M10 x 70, zinc plated self locking nut M10, zinc plated coarse washer, A10,5, zinc plated		8.8 St St	933 982 125	
24		8 8 16	hexagon head screw M10 x 40, zinc plated hexagon nut M10, zinc plated coarse washer, A10,5, zinc plated		8.8 St St	933 934 125	

Piece list

RETEK Goslar
Recycling GmbH

Title: Vibrating filter 200/36, about 55m²				Customer:			
Sach-Nr.: 42-001-013			Drawing no.: 42-001-013.2	Commisson no.:			Date: 01.04.25
Pos.	**Subject no.**	**piece**	**Denomination**	**Kg**	**Material**	**DIN**	**Drawing no.:**
25		2 2 4	hexagon head screw M12 x 80, zinc plated hexagon nut M12, zinc plated coarse washer, A13, zinc plated		8.8 St St	933 934 125	
26		8 8 16	hexagon head screw M6 x 25, zinc plated hexagon nut M6, zinc plated coarse washer, A6,4, galv.		8.8 St St	933 934 125	
27		8 8 16	hexagon head screw M6 x 25, zinc plated hexagon nut M6, zinc plated coarse washer, A6,4, zinc plated		8.8 St St	933 934 125	
28		4 4 8	hexagon head screw M12 x 40, zinc plated hexagon nut M12, zinc plated coarse washer, A10,5, zinc plated		8.8 St St	933 934 125	
29		4 4	compound dowel UKA 3 EAP M20 screw bolt ASTAM 20/220				

Annex F1-2 Emissions Monitoring Data (English)

Annex F1-2 Emissions Monitoring Data (German)

Immark AG, Regensdorf
Emission measurements
at the electro scrap recycling plant

Report No. : 5031

Table of contents:

December 2002

Summary

The following chart deals with summary of the peak seized measured values per hour and the limits according the air polluting control (APC).

Harmful substances:

Limit value of harmful substances
APC [1] peak per hour
g/h mg/m³ $_{n,tr}$ *g/h* mg/m³ $_{n,tr}$
Dust filter plants processing and sorting, 06.11.02 *500* 50 *13* ± *5* 0.9 ± 0.4
Dust filter encapsulation plant, 06.11.02 *500* 50 *26* ± *11* 0.8 ± 0.3
Dust filter subtle-separation, 07.11.02 *500* 50 *4.1* ± *1.6* 0.9 ± 0.3
[1] limit values according to APC attachment 4 figure 41. All of the values are listed as dry gas in standard condition (0°C, 1013 mbar). An existing mass flow rate limit value (g/h) has to be taken into account as soon as this value has been reached or even exceeded.

Remark:

None of the measured dust concentrations has exceeded 1 mg/m3 which meant that an analysis of dust containing heavy metal components wasn't necessary.

Auxiliary ratings:

Measurand, measuring value
Volume flow filter plants processing and sorting m³/h $_{n,tr}$ 13'500 ± 700
Volume flow filter encapsulation plant m³/h $_{n,tr}$ 31'000 ± 2'000
Volume flow filter subtle-separation m³/h $_{n,tr}$ 4'700 ± 200

1. Order

Immark AG, Regensdorf, placed an order to carry out emission measurements according to the requirements of the air polluting control (APC) as well as to AWEL on three chimneys of the electro scrap recycling plant. Following measurements has been seized:
- volume flow (random sample)
- temperature
- dust
- heavy metals (only dust-compound components):

- nickel, when dust mass flow rate reaches or exceeds 5 g/h and the dust concentration exceeds 1 mg/m3.
- antimony, copper and tin, when dust mass flow rate reaches or exceeds 25 g/h and the dust concentration exceeds 5 mg/m3.

2. Orderer

Immark AG
Herrn M. Stengele
Bahnstrasse 142
8105 Regensdorf

3. Plant

As for the new electro scrap recycling plant, following five stages are sorted out:
Stage 1:
Incoming goods department, triage after separating of harmful substances and automatic processing
Stage 2:
Material discharge, mechanic processing including chain crushing and sorting of bits and pieces. manual sorting of metals, iron and printed circuit boards > 100 mm
Stage 3:
Pre-crushing for material compound separation, mechanic and magnetic separation.
The exhaust ventilation at work stations and sorting positions are provided by two ventilators, which enable a suction of 167 m3/min.
The exhaust air is de-dusted by two filters
Stage 4:
Encapsulation plant, mechanic and magnetic separation and subtle separation.
The suction of the encapsulation plant, which enables a suction of 630 m3/min.
The exhaust air of the encapsulation plant is de-dusted by a hose filter
The suction of the subtle separation, which enables a suction of 367 m3/min.
The exhaust air of the subtle separation is de-dusted by a hose filter.
Stage 5:
metal-metal-separations "Happle".

4. Implementation of the measurements

The measurements were carried out by Dr. Ch. Mattenberger and Mister H. Hostettler on the 6th and 7th November in 2002.

Plant conditions

Average plant conditions on both days.

Explanation concerning the used abbreviations:

T Gas temperature in main flow (flue-gas pipe)
b Barometer pressure (ambient pressure)
Δp pressure difference in the flue-gas pipe (negative due to vacuum)
f water content standardized to standard condition (0°C, 1013 mbar), dry
v Gas speed
V_b Gas volume flow during processing
$V_{n,f}$ Gas volume flow standardized to standard condition (0°C, 1013 mbar), damp
$V_{n,tr}$ Gas volume flow standardized to standard condition (0°C, 1013 mbar), dry
V Gas volume flow of the sample in standard condition (0°C, 1013 mbar), dry
m dust amount on filter

Preliminary remark :
All of the information on concentration refers to dry gas in standard condition (0 °C, 1013 mbar).

5. Measuring after filter processing and sorting

Location of the test point (refer to attachment, test point 1)

A 2"-outlet within the chimney for pure gas past the filter (10 m above floor, accessible by a lift).

5.1. Results of the volume flow rate

Plant: Electro scrap recycling plant , test point: filter plants, processing + sorting
channel cross section of test point: ø 450 mm , face: 0.159 m²
06.11.2002 volume flow rate filter plants, processing + sorting
Zeit T b Δp f * v V_b $V_{n,f}$ $V_{n,tr}$
°C mbar mbar kg/m³ $_{n,tr}$ m/s m³/h $_b$ m³/h $_{n,f}$ m³/h $_{n,tr}$
09:40 18 972 5.5 0.01 26.3 15'100 13'600 13'500 ± 700
* estimated, corresponds to the surrounding humidity

5.2. Results of dust measurement

Concentrations: mass flow rate:
filter plants, processing + sorting, 06.11.02
time of measuring V m dust dust
from to m³ $_{n,tr}$ mg mg/m³ $_{n,tr}$ *g/h*
10:00 10:55 2.784 1 0.5 ± 0.4 *6 ± 5*
11:00 11:55 2.743 < 1 < 0.4 < *5*
12:00 12:55 2.820 3 0.9 ± 0.4 *13 ± 5*
averaged value 0.6 ± 0.4 *8 ± 5*
Remark:
None of the measured dust concentrations has exceeded 1 mg/m3 which meant that an analysis of dust concentration containing heavy metal components wasn't necessary.

6. Measurement after encapsulation plant filter

Location of the test point (refer to attachment test point 2)

a 3"-outlet within the chimney for pure gas past the filter.

6.1. Results of the volume flow rate

Plant: Electro scrap recycling plant, test point: encapsulation plant
channel cross section of test point: ø 900 mm , face: 0.636 m²
06.11.2002 volume flow rate filter encapsulation plant BHS
Zeit T b Δp f * v V_b $V_{n,f}$ $V_{n,tr}$
°C mbar mbar kg/m³ $_{n,tr}$ m/s m³/h $_b$ m³/h $_{n,f}$ m³/h $_{n,tr}$
12:10 24 972 5 0.01 15.4 35'000 31'000 31'000 ± 2'000
* estimated, corresponds to the surrounding humidity

6.2. Results of the dust measurments

Concentrations: mass flow rate:
Filter encapsulation plant BHS , 06.11.02
time of measuring V m dust dust
from to m³ $_{n,tr}$ mg mg/m³ $_{n,tr}$ *g/h*
13:30 14:30 2.873 1 0.4 ± 0.3 *13 ± 11*
14:35 15:35 2.895 2 0.8 ± 0.3 *26 ± 11*
07:30 08:30 3.017 2 0.8 ± 0.3 *25 ± 10*
averaged value 0.7 ± 0.3 *21 ± 11*
Remark:

None of the measured dust concentrations has exceeded 1 mg/m3 which meant that an analysis of dust concentration containing heavy metal components wasn't necessary.

7. Measurement after subtle separation filter

Location of the test point (refer to attachment test point 3)

A 2"-outlet within the chimney for pure gas past the filter

7.1. Results of the volume flow rate

Plant: Electro scrap recycling plant, test point: filter for subtle separation
channel cross section of test point: ø 450 mm , face: 0.159 m²
07.11.2002 volume flow rate filter subtle separation

Zeit	T	b	Δp	f *	v	V_b	$V_{n,f}$	$V_{n,tr}$
	°C	mbar	mbar		kg/m³ $_{n,tr}$	m/s	m³/h $_b$	m³/h $_{n,f}$	m³/h $_{n,tr}$
07:45	10	960	1.6	0.01	9.0	5'200	4'700	4'700 ± 200

* estimated, corresponds to the surrounding humidity

7.2. Results of the dust measurement

Concentrations: mass flow rate:

Filter encapsulation plant , 06th November 02

time of measuring from	to	V m³ $_{n,tr}$	m dust mg	dust mg/m³ $_{n,tr}$	*g/h*
08:45	09:45	2.868	3	0.9 ± 0.3	*4.1 ± 1.6*
09:50	10:50	2.906	< 1	< 0.3	*< 1.6*
10:55	11:55	2.950	3	0.8 ± 0.3	*4.0 ± 1.6*
averages value				0.7 ± 0.3	*3.2 ± 1.6*

Remark:

None of the measured dust concentrations has exceeded 1 mg/m3 which meant that an analysis of dust concentration containing heavy metal components wasn't necessary.

8. Measuring technique, measuring equipment

The measurements correspond to the recommendations made by the Federal Office for environment, forest and landscape about the emission measurement concerning air pollutants caused by fixed plants (BUWAL emission measuring recommendation) issued in January 1996. The measurement recommendations base on the European (CEN Regulations) as well as the issued standards set by other countries (VDI-regulations in particular).

Volume flow rate:

Measurement of the gas speed with "Prandtl" pipe and micro manometer (BUWAL emission measurement recommendation, chapter 3.1.3).

Temperature of exhaust air:

Measurement by NiCr/Ni- thermo element.

Dust:

The measurement of dust correspond to the emission measurement recommendation according to BUWAL emission measurement recommendation, chapter 4.3
(solid material measurement by external filters), and VDI regulations Nr. 2066, page 1.
The sampling taken from the main flow (chimney) was carried out isokinetically outside the main flow by an external filter device for flat filters. The exhaust volume flow rate is adjusted by pending body flow meter. The condensate gathers in a backflow cooler, which is fixed between

the filter device and the gas pump. The exhaust volume is defined by a gas meter, which is equipped with a dry cell template.
A quartz fibre flat filter is used as filter.
The testing probe as well as the filter bracket (both made of titanium) are regularly heated corresponding to a slightly higher temperature than the dew point of the exhaust gas.
Definition of the dust amount: gravimetric.

Measuring uncertainty and verification limit of the applied technique

The mentioned measuring uncertainties correspond to the 95%-confidetal limits, which have been rated according to information within the VDI regulations and the BUWAL measurement recommendation.

Measure and verification and relative measuring limit uncertainty
Volume flow rate
- Processing and sorting $m^3/h_{n,tr}$ 700 5 %
- Encapsulation plant $m^3/h_{n,tr}$ 3'000 5 %
- Subtle separation $m^3/h_{n,tr}$ 700 5 %

dust $mg/m^3_{n,tr}$ 0.3 10%

Wiler b. Utzenstorf, 6th December 2002
Airmes AG
air hygienics measurement and advice
3428 Wiler b. Utzenstorf
Dr. M. Andrée Dr. Ch. Mattenberger

Chimneys emission measurements:
1. Processing and sorting
2. Encapsulation plant
3. Subtle separation

3
2
1 1
2
3

Attachment: Overview with chimneys

Immark AG, Regensdorf

Emissionsmessungen
in der Elektronikschrott-Aufbereitungsanlage

Bericht Nr. : 5031

Inhaltsverzeichnis :

Dezember 2002

Zusammenfassung

In der folgenden Tabelle sind die maximalen Stundenmittel der erfassten Messgrössen und die Grenzwerte gemäss Auflagen der Luftreinhalteverordnung (LRV) zusammengestellt.

Schadstoffe:

Schadstoff	Grenzwert LRV [1]		Messwert max. Stundenmittel	
	g/h	mg/m³ $_{n,tr}$	*g/h*	mg/m³ $_{n,tr}$
Staub Filteranlagen Bearbeitung + Sortierung , 06.11.02	*500*	50	*13 ± 5*	0.9 ± 0.4
Staub Filter Verkugelungsanlage BHS , 06.11.02	*500*	50	*26 ± 11*	0.8 ± 0.3
Staub Filter Feinseparation , 07.11.02	*500*	50	*4.1 ± 1.6*	0.9 ± 0.3

[1] Grenzwerte gemäss LRV Anhang 1 Ziffer 41 . Alle Werte sind für trockenes Gas im Normzustand (0°C, 1013 mbar) angegeben. Falls ein Massenstromgrenzwert (g/h) existiert, heisst dies, dass der Konzentrationsgrenzwert (mg/m³) erst beim Erreichen oder Überschreiten dieses Massenstromgrenzwertes massgebend ist.

Bermerkung:
Auf eine Schwermetallanalyse am Staub konnte verzichtet werden, weil keine der gemessenen Staubkonzentrationen 1 mg/m³ überschreitet.

Hilfsgrössen:

Messgrösse		Messwert
Volumenstrom Filteranlagen Bearbeitung + Sortierung	m³/h $_{n,tr}$	13'500 ± 700
Volumenstrom Filter Verkugelungsanlage BHS	m³/h $_{n,tr}$	31'000 ± 2'000
Volumenstrom Filter Feinseparation	m³/h $_{n,tr}$	4'700 ± 200

1. Auftrag

Im Auftrag der Immark AG, Regensdorf, waren Emissionsmessungen an drei Kaminen der Elektronikschrottaufbereitungsanlage gemäss Auflagen der Luftreinhalteverordnung (LRV) und dem AWEL durchzuführen. Folgende Messgrössen wurden erfasst:

- Volumenstrom (Stichprobe)
- Temperatur
- Staub
- Schwermetalle (nur staubgebundener Anteil):
  - Nickel, falls der Staubmassenstrom 5 g/h erreicht oder überschreitet und die Staubkonzentration 1 mg/m^3 überschreitet.
  - Antimon, Kupfer und Zinn, falls der Staubmassenstrom 25 g/h erreicht oder überschreitet und die Staubkonzentration 5 mg/m^3 überschreitet.

2. Auftraggeber

Immark AG

Herrn M. Stengele

Bahnstrasse 142

8105 Regensdorf

3. Anlage

Bei der neuen Elektronikschrottaufbereitungsanlage wird nach folgenden fünf Stufen sortiert:

Stufe 1:

Warenannahme, Triage nach Schadstoffentfrachtung und maschineller Verarbeitung

Stufe 2:

Materialaufgabe, mechanische Bearbeitung mit Kettenzerschlagung und Aussortierung von Kleinteilen. Handsortierung von Metallen, Eisen und Leiterplatten > 100 mm

Stufe 3:

Vorzerkleinerung zur Materialverbundtrennung, mechanische und magnetische Separation.

Die Absaugungen der Bearbeitungs- und Sortierplätze werden durch zwei Ventilatoren "Werra Radialventilator", Typ M 167/400, Baujahr 2000, abgesaugt, die für eine Gesamtluftmenge von 167 m^3/min ausgelegt sind.

Die abgesaugte Luft wird durch zwei Filter "Dehne Entstaubungstechnik", Typ DS 1.8/90/65 mit Baujahr 2000 entstaubt.

Stufe 4:

Verkugelungsanlage BHS, mechanische und magnetische Sortierung und Feinseparation.

Die Absaugungen der Verkugelungsanlage werden durch einen Ventilator "Keller", Typ MXE 040-063015 mit Baujahr 2001 abgesaugt, der für eine Luftmenge von 630 m^3/min ausgelegt ist.

Die abgesaugte Luft der Verkugelungsanlage wird durch einen Filter "Keller Lufttechnik" entstaubt.

Die Absaugungen der Feinseparation werden durch einen Ventilator "Happle", Typ RV HL/RU 56 OMB GR2/0 mit Baujahr 2002 abgesaugt, der für eine Luftmenge von 367 m^3/min ausgelegt ist.

Die abgesaugte Luft der Feinseparation wird durch einen Filter "Happle" entstaubt.

Stufe 5:

Metall-Metall-Sepparationen "Happle".

4. Durchführung der Messungen

Die Messungen wurden am 6. und 7. November 2002 von den Herren Dr. Ch. Mattenberger und H. Hostettler durchgeführt.

Betriebsbedingungen

Normale Betriebsbedingungen an beiden Messtagen.

Erläuterung der verwendeten Abkürzungen:

T	Gastemperatur im Hauptstrom (Rauchgasleitung)
b	Barometerdruck (Umgebungsdruck)
Δp	Druckdifferenz in der Rauchgasleitung (negativ = Unterdruck)
f	Wassergehalt normiert auf Normzustand (0°C, 1013 mbar), trocken
v	Gasgeschwindigkeit
V_b	Gasvolumenstrom im Betriebszustand
$V_{n,f}$	Gasvolumenstrom normiert auf Normzustand (0°C, 1013 mbar), feucht
$V_{n,tr}$	Gasvolumenstrom normiert auf Normzustand (0°C, 1013 mbar), trocken
V	Gasvolumen der Probenahme im Normzustand (0°C, 1013 mbar), trocken
m	Staubmasse auf Filter

Vorbemerkung :

Alle Konzentrationsangaben beziehen sich auf trockenes Gas im Normzustand (0 °C, 1013 mbar).

5. Messung nach Filter Bearbeitung und Sortierung

Lage der Messstelle (siehe Anhang, Messpunkt 1)

Ein 2"-Stutzen im Reingaskamin nach Filter (10 m über Boden, Zugang über Scherenlift).

5.1. Resultate der Volumenstrommessung

Anlage: Elektronikschrottaufbereitung , Messstelle: Filteranlagen Bearbeitung + Sortierung
Kanalquerschnitt an der Messstelle: ø 450 mm , Fläche: 0.159 m²

06.11.2002	Volumenstrom Filteranlagen Bearbeitung + Sortierung							
Zeit	T	b	Δp	f *	v	V_b	$V_{n,f}$	$V_{n,tr}$
	°C	mbar	mbar	kg/m³ n,tr	m/s	m³/h b	m³/h n,f	m³/h n,tr
09:40	18	972	5.5	0.01	26.3	15'100	13'600	13'500 ± 700

* geschätzt, entspricht der Feuchte der Umgebungsluft

5.2. Resultate der Staubmessungen

Konzentrationen:

Filteranlagen Bearbeitung + Sortierung , 06.11.02				
Messzeit		V	m	Staub
von	bis	m³ n,tr	mg	mg/m³ n,tr
10:00	10:55	2.784	1	0.5 ± 0.4
11:00	11:55	2.743	< 1	< 0.4
12:00	12:55	2.820	3	0.9 ± 0.4
Mittelwert				0.6 ± 0.4

Massenströme:

Staub
g/h
6 ± 5
< 5
13 ± 5
8 ± 5

Bemerkung:

Auf eine Schwermetallanalyse am Staub konnte verzichtet werden, weil keine der gemessenen Staubkonzentrationen den Grenzwert von 1 mg/m³ überschreitet.

6. Messung nach Filter Verkugelungsanlage

Lage der Messstelle (siehe Anhang Messpunkt 2)

Ein 3"-Stutzen im Reingaskamin nach Filter.

6.1. Resultate der Volumenstrommessung

Anlage: Elektronikschrottaufbereitung , Messstelle: Filter Verkugelungsanlage BHS
Kanalquerschnitt an der Messstelle: ø 900 mm , Fläche: 0.636 m²

06.11.2002	Volumenstrom Filter Verkugelungsanlage BHS							
Zeit	T	b	Δp	f *	v	V_b	$V_{n,f}$	$V_{n,tr}$
	°C	mbar	mbar	kg/m³ $_{n,tr}$	m/s	m³/h $_b$	m³/h $_{n,f}$	m³/h $_{n,tr}$
12:10	24	972	5	0.01	15.4	35'000	31'000	31'000 ± 2'000

* geschätzt, entspricht der Feuchte der Umgebungsluft

6.2. Resultate der Staubmessungen

Konzentrationen:

Filter Verkugelungsanlage BHS , 06.11.02				
Messzeit		V	m	Staub
von	bis	m³ $_{n,tr}$	mg	mg/m³ $_{n,tr}$
13:30	14:30	2.873	1	0.4 ± 0.3
14:35	15:35	2.895	2	0.8 ± 0.3
07:30	08:30	3.017	2	0.8 ± 0.3
Mittelwert				0.7 ± 0.3

Massenströme:

Staub
g/h
13 ± 11
26 ± 11
25 ± 10
21 ± 11

Bemerkung:

Auf eine Schwermetallanalyse am Staub konnte verzichtet werden, weil keine der gemessenen Staubkonzentrationen den Grenzwert von 1 mg/m³ überschreitet.

7. Messung nach Filter Feinseparation

Lage der Messstelle (siehe Anhang Messpunkt 3)

Ein 2"-Stutzen im Reingaskamin nach Filter.

7.1. Resultate der Volumenstrommessung

Anlage: Elektronikschrottaufbereitung , Messstelle: Filter Feinseparation
Kanalquerschnitt an der Messstelle: ø 450 mm , Fläche: 0.159 m²

07.11.2002	Volumenstrom Filter Feinseparation							
Zeit	T	b	Δp	f *	v	V_b	$V_{n,f}$	$V_{n,tr}$
	°C	mbar	mbar	kg/m³ $_{n,tr}$	m/s	m³/h $_b$	m³/h $_{n,f}$	m³/h $_{n,tr}$
07:45	10	960	1.6	0.01	9.0	5'200	4'700	4'700 ± 200

* geschätzt, entspricht der Feuchte der Umgebungsluft

7.2. Resultate der Staubmessungen

		Konzentrationen:			*Massenströme:*
Filter Verkugelungsanlage BHS , 06.11.02					
Messzeit		V	m	Staub	Staub
von	bis	$m^3_{n,tr}$	mg	$mg/m^3_{n,tr}$	*g/h*
08:45	09:45	2.868	3	0.9 ± 0.3	*4.1 ± 1.6*
09:50	10:50	2.906	< 1	< 0.3	*< 1.6*
10:55	11:55	2.950	3	0.8 ± 0.3	*4.0 ± 1.6*
Mittelwert				0.7 ± 0.3	*3.2 ± 1.6*

Bemerkung:

Auf eine Schwermetallanalyse am Staub konnte verzichtet werden, weil keine der gemessenen Staubkonzentrationen den Grenzwert von 1 mg/m^3 überschreitet.

8. Messverfahren, Messgeräte

Die Messungen erfolgen gemäss den Empfehlungen des Bundesamtes für Umwelt, Wald und Landschaft über die Emissionsmessung von Luftfremdstoffen bei stationären Anlagen (BUWAL Emissions-Messempfehlungen) vom Januar 1996 und den diesen Messempfehlungen zugrundeliegenden europäischen (CEN-Richtlinien) sowie von einzelnen Ländern herausgegebenen Normen (insbesondere VDI-Richtlinien).

Volumenstrom:

Messung der Gasgeschwindigkeit mit Prandtlrohr und Mikromanometer (BUWAL Emissions-Messempfehlungen, Kapitel 3.1.3).

Ablufttemperatur:

Messung mit NiCr/Ni- Thermoelement.

Staub:

Die Staubmessung erfolgt gemäss den BUWAL Emissions-Messempfehlungen, Kapitel 4.3 (Feststoffmessung mit aussenliegenden Filtern), und VDI Richtlinie Nr. 2066, Blatt 1.

Die Probenahme aus dem Hauptstrom (Kamin) erfolgt isokinetisch mit einem ausserhalb des Hauptstromes liegenden Filtergerät für Flachfilter. Der Absaugvolumenstrom wird mit einem Schwebekörper-Durchflussmesser eingestellt. Das Kondensat sammelt sich in einem zwischen Filtergerät und Gaspumpe geschalteten Rückflusskühler. Das Absaugvolumen wird mit einem Gaszähler mit Trockenvorlage (Silikagel) bestimmt.

Als Filter werden Quarzfaserflachfilter verwendet.

Die Entnahmesonden und Filterhalter (beides aus Titan) werden auf Temperaturen über dem Taupunkt des Abgases geregelt beheizt.

Bestimmung der Staubmenge: gravimetrisch.

Messunsicherheit und Nachweisgrenze der verwendeten Verfahren

Bei den angegebenen Messunsicherheiten handelt es sich um die 95%-Vertrauensgrenzen, die gemäss Angaben der VDI Richtlinien und der BUWAL-Messempfehlungen abgeschätzt wurden.

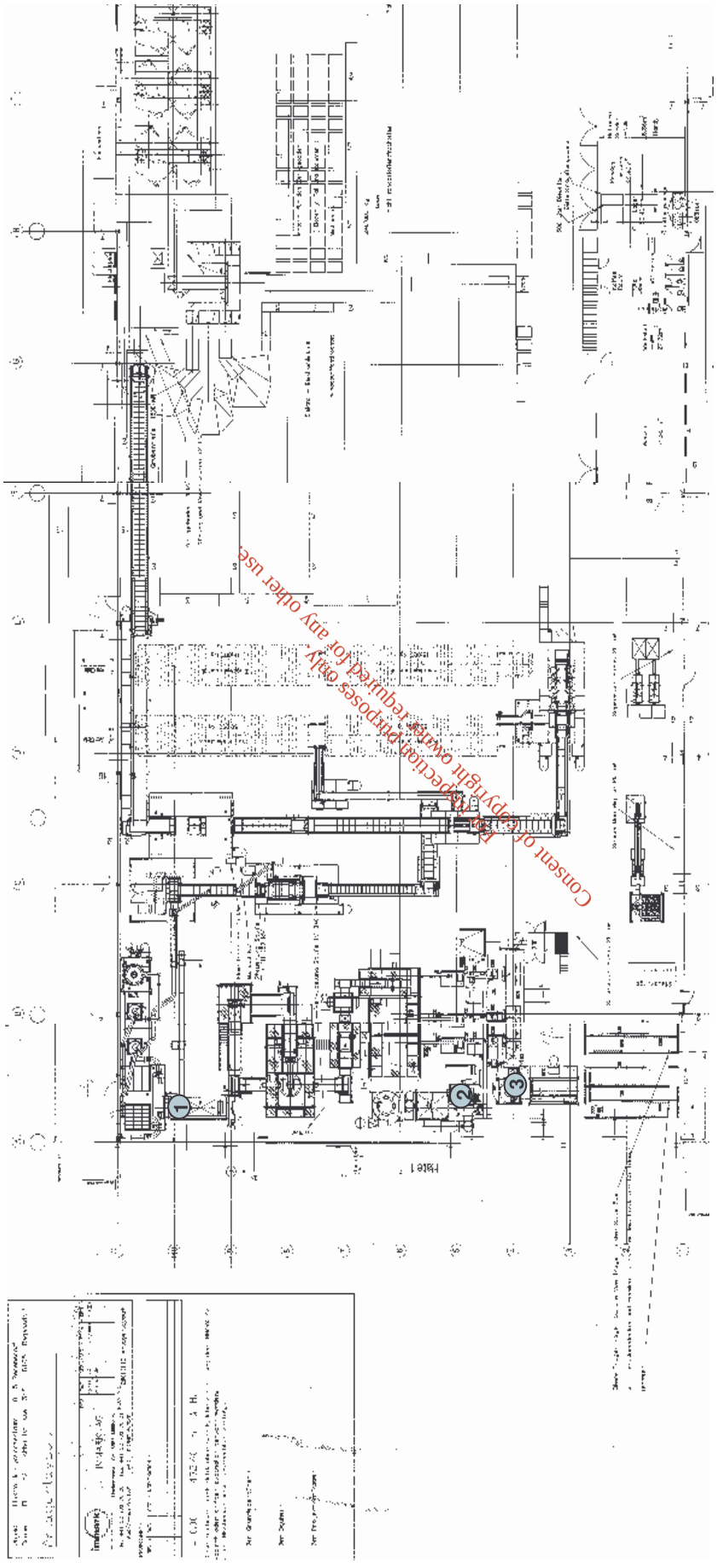
Messgrösse		Nachweis-grenze	relative Mess-unsicherheit
Volumenstrom			
- Bearbeitung und Sortierung	$m^3/h_{n,tr}$	700	5 %
- Verkugelungsanlage	$m^3/h_{n,tr}$	3'000	5 %
- Feinsortierung	$m^3/h_{n,tr}$	700	5 %
Staub	$mg/m^3_{n,tr}$	0.3	10%

Wiler b. Utzenstorf, 6. Dezember 2002

Airmes AG
Lufthygienische Messungen und Beratung
3428 Wiler b. Utzenstorf

Dr. M. Andrée Dr. Ch. Mattenberger

Anhang: Übersichtsplan der Kamine



Kamine Emissionsmessungen:
1. Bearbeitung und Sortierung
2. Verkugelungsanlage
3. Feinseparation

Monitoring & Sampling Points

Attachment F2

The location of each of the following monitoring location points is identified on *Drawing 20*.

Table F2: Emissions Monitoring & Sampling Locations Major Air Emission Point

Emission Point Reference No: **A1-1** (Combined Stack from the Tube Jet Filters)
Grid Reference 309432E, 232654N

Parameter	Monitoring frequency	Accessibility of Sampling Points
Total particulates	Quarterly initially. The results will be reviewed with the Agency with aim of reducing the frequency of testing as appropriate.	Via an internal platform – to be constructed.
Total Metals	Quarterly initially. The will be reviewed with the Agency with aim of reducing the frequency of testing as appropriate.	Via an internal platform – to be constructed.

Table F3: Emissions Monitoring & Sampling Locations Minor Air Emission Point

Emission Point Reference No: **A2-1** (Combined Stack from the CRT Machine
Grid Reference 309460E, 232685N

Parameter	Monitoring frequency	Accessibility of Sampling Points
Total particulates	Quarterly initially. The results will be reviewed with the Agency with aim of reducing the frequency of testing as appropriate.	Via an internal platform – to be constructed.
Total Metals	Quarterly initially. The will be reviewed with the Agency with aim of reducing the frequency of testing as appropriate.	Via an internal platform – to be constructed.

Table F4: Emissions Monitoring & Sampling Locations Surface Water Discharge - Upstream

Emission Point Reference No: **SW1** – Upstream
Grid Reference 309405E, 232738N

Parameter	Monitoring frequency	Accessibility of Sampling Points
Visual inspection for hydrocarbons and particulates	Monthly	Inspection chamber cover

Table F5: Emissions Monitoring & Sampling Locations Surface Water Discharge – Downstream

Emission Point Reference No: **SW5** - Downstream
Grid Reference 309450E, 232748N

Parameter	Monitoring frequency	Accessibility of Sampling Points
Visual inspection for hydrocarbons and particulates	Monthly	Inspection chamber cover

Table F6: Emissions Monitoring & Sampling Locations Noise Monitoring Locations

Emission Point Reference No: N - 1
Grid Reference 309435E, 232744N

Parameter	Monitoring frequency	Accessibility of Sampling Points
LAeq 15-min, LA10, LA90, Third-Octave frequency analysis.	Annually	External are on site boundary

Table F7: Emissions Monitoring & Sampling Locations Noise Monitoring Locations

Emission Point Reference No: N - 2
Grid Reference 309402E, 232618N

Parameter	Monitoring frequency	Accessibility of Sampling Points
LAeq 15-min, LA10, LA90, Third-Octave frequency analysis.	Annually	External are on site boundary

Table Ff: Fugitive Air Emissions Monitoring & Sampling Locations

Monitoring Points Reference No: **A2-3, A2-4, A2-5, A2-6, A2-7 A2-8** (Building Roof Vents)

Parameter	Monitoring frequency	Accessibility of Sampling point
Dust	As required under the pending Licence. As a minimum a Fugitive Emissions study will be undertaken	Via external temporary ladder to a 20^{o} sloped roof
Total Metals	As required under the pending Licence. As a minimum a Fugitive Emissions study will be undertaken	Via external temporary ladder to a 20^{o} sloped roof