

Guidelines for machines and plant construction

Valid for:

Lenzing Plastics GmbH & Co. KG

1. GENERAL INFORMATION

The mechanical equipment is used in a plastic film production unit. The operational safety of the equipment supplied by you is essential for the proper functioning of the machines and the units.

All machines and machine parts must be planned and built in compliance with the European directives and the respective Austrian regulations (machine guideline): Machine Safety Regulations (MSV), Pressure Equipment Guidelines, Pressure Equipment Regulation (DGVo), Low-Voltage Guideline, Low-Voltage Equipment Regulation (NSpGV), EMV-Guideline, Electromagnetic Compatibility Regulation (EMVV), ATEX- Guideline and Explosion Prevention Regulation (ExSV).

Electrical units must comply with the electro-technical regulations and the compulsory ÖVE-Standards.

The relevant CE-conformity declarations or assembly descriptions must be presented for all machines and unit components and the CE-label must be mounted according to the relevant regulations.

The guidelines must also be made available to the sub-contractor. It is the responsibility of the contractor to make sure that this is carried out.

Deviations from our guidelines require our express written approval.

	Erstellung/Prüfung	QM-Vermerk	Einkauf	Freigabe	Dok - Nr.:
Datum					Ausgabe:
Bereich	FOPT	FOQ	FO	FO	Rev. Nr:
Name	M.Hinterlechner	J.Heitger	B.Reith	J.Huber	Ersetzt:
Unterschrift					Seite: Seite 1 von 10

2. SAFETY REQUIREMENTS

The standards listed below must be kept to during planning and construction at all times:

EN 12100	Basic terms, general principles for design part 1 and part 2
EN 894	Ergonomic requirements
EN 349	Minimum gaps to avoid crushing
EN 13857	Safety distances
EN 14122	Permanent access to machinery
EN 13478	Fire prevention and protection
EN 13849	Surface temperatures
EN 1093	Hazardous substances
EN 60204	Electrical equipment
EN 61310	Displays/Indication on machinery
EN 1760	Pressure-sensitive protective devices: pressure-sensitive edges and bars
EN 953	Protective guards
EN 1088	Interlocking devices associated with guards
EN 13855	Safeguards: with respect to approach speeds
EN 1037	Prevention of unexpected start-up
EN 13850	EMERGENCY-OFF - general principles for design
EN 13849	Safety-related parts of control systems
EN 842	Visual danger signals
EN 7731	Auditory danger signals
EN 10218	Industrial robots
EN 60754	Electric tools

The use of further specific standards may be necessary in certain cases (e.g. for fluid machines, thermal process machines etc.).

The machine must be delivered complete with all the relevant safety (special) equipment so that the machine can be set-up, serviced and operated safely.

Safety components (e.g. hand guards etc.) must be marked in yellow and black.

3. EXPLOSION PREVENTION

If explosion prevention is necessary, the explosion risk must be documented in an explosion zone plan as to the nature and dimension and the machines should be equipped accordingly. The technical explosion prevention measures must be agreed on with us.

Machines and mechanical equipment for use in explosion prevention zones must be supplied with a valid test certificate from an authorized European testing laboratory which must be included in the documentation. (Machinery and prevention systems for explosion-risk areas must conform to the European Guideline 94/9EG or ExSV). Suitable measures must be taken to allow discharge of electrostatic charge, proof of this must be provided.

All machines and mechanical equipment where the Atex-guideline 94/9EG is applicable must be included in a list with a designated number. The machines and mechanical equipment must be included in a layout plan complete with number. Furthermore the numbers must be allocated to the corresponding testing certificates. An example of how to do this can be obtained from us.

The explosion prevention documentation must be completed by the contractor.

4. CORROSION PROTECTION AND STRUCTURAL STEELWORK

If the construction is to be erected outdoors, then the type of corrosion protection and the structural steelwork must be agreed on with us.

5. MEDIA PIPELINES

Pipelines should preferably be made out of stainless steel and be marked according to the standard (medium, direction of flow, pressure).

Cooling water supply from Lenzing:

- Operating temperature cooling water $12^{\circ}\text{C} \pm 1^{\circ}\text{C}$
- Supply pipe pressure 3 to 3,5 bar

Hot water from Lenzing:

-
- Operating temperature hot water (supply) 150°C, max. 160°C
- Operating pressure 7 bar, max. 14 bar

Your quotation must include binding data regarding the expected consumption for:

- Cooling water in [m³/h]
- Hot water in [m³/h]
- DI-water in [l/h]
- Osmosis water in [l/h]

6. COMPRESSED AIR SUPPLY

Compressed air supply from Lenzing:

- Operating pressure 5 - 6 bar

Your quotation must include binding data regarding the expected consumption of compressed air in Nm³/h.

- Pressure pipelines (P-pipelines) must be in blue (blue pipe)

Pipeline labeling:

All pneumatic pipes must be labeled on both ends. The labeling must correspond to the pneumatic layout plan.

Labels from the Murrplastik Company must be used.

All pneumatic valves must be fitted with a valve protection circuit and with LED. The function designation of the valve groups must be displayed on engraved labels.

7. CONNECTIONS FOR MOBILE MACHINE PARTS

Electrical connections as for example, jets, sieve filters, all heaters, temperature sensor etc. are to be fitted with plug-in connections or quick-release couplings.

Electrical connection plugs from the Harting Company or the Amphenol Company must be used. The release of the pin assignment must be given by LPG; the compatibility of the LPG pre-warming station must be given.

8. ADJUSTMENT DRIVES

Adjustment drives such as for example, the height adjustment of water baths must be driven by an electric motor.

9. TEMPERATURE SENSOR

Temperature measurements:

Jumo resistance thermometer Pt 100, 8mm Ø according to DIN IEC 751 in three-wire or four-wire connection, screw connection 1/2" (3/4")

Quick reaction type, reinforced neck pipe (similar to DIN 43765, 43766)

Welded sleeve with sealing surfaces!

Bayonet socket design!

Preferred total length: 160, 250, 400 mm

Thermo couple elements Fe-CuNi, NiCr-Ni type according to DIN IEC 584:

- Jumo

10. ROLLER BEARING

Make:

- SKF
- FAG
- INA
- NMB

11. WINDING SHAFTS

Needed expansion-range 150-152,4mm (=6")

Make:

- IBD
- Neuenhauser Vorwald
- Fife- Tidland
- Spanntec
- Double E International

12. SAFETY CHUCK

Make:

- Boschert

13. EXTRUDER DRIVE

Make:

- Eisenbeis

- Flender
- Knödler

14. OILS AND GREASES

The use of Mobil oils is preferred.

A comparison table must be drawn up for all oils and greases.

Lubrication points must be accessible without having to remove covers etc.

Lubrication points must be accessible without uphill facilities otherwise a central lubrication point is provided (fat sleeves).

Greases and oils from the Klüber Company must not be used.

15. ROLLERS

Heated rollers:

Temperature tolerance on the working surface $\pm 1^{\circ}\text{C}$ over the total operating range.

Chill rollers:

Temperature tolerance on the working surface $\pm 1^{\circ}\text{C}$ over the total operating range.

Corona rollers:

The type must be agreed with us.

Rubberized rollers:

The type of rubberizing (manufacturer and rubber quality) must be stated.

16. BELTS AND CHAINS

Flat belts, toothed belts, chains and v-belt drives must be easily accessible for exchanging.

The safety devices have to offer sufficient protection in all operating situations (also fitting and maintenance). General fencing-off is not sufficient!

17. HYDRAULIC

Make:

- Rexroth

All hydraulic valves must be equipped with valve protection circuits and with LED's. The function designation of the valve groups must be displayed on engraved labels.

All hydraulic pipes must be marked with brown signs.

Hydraulic pipes must be in brown.

18. PNEUMATIC

Make:

- Festo
- SMC
- Parker

19. ROTATING UNIONS

Make: :

- Deublin

Maier-Dichtköpfe

Rotating unions must be equipped with a locking device!

20. HEAT EXCHANGER

Heat exchangers must be made out of stainless steel 1.4301 or better! Heat exchangers must never be delivered in copper.

21. ASSEMBLY GUIDELINES

The general terms of contact for safety and environment protection for working on site at Lenzing AG must be observed. The workmen must be instructed by a construction site coordinator from Lenzing Plastics before commencing work. When employing foreign companies or workmen the relevant regulations must be complied with (see SG standard foreign company coordinators).

Information about regulations and literature: BGI 608S selection and operation of mobile electrical equipment according to area of application. BGI 608 selection and operation of electrical units and equipment on construction sites.

22. DOCUMENTATION

The documentation must comply with the latest European guidelines

Language: German

The scope of the documentation must be included in the offer.

The documentation must include all the necessary information and data for the use, service, maintenance, and spare parts supply.

Preferred CAD-System – ACAD LT 2008 2D and EPLAN. The symbol library used must be included in all cases in order to allow a 100% continuation of work.

Worm gear drawings must be included!

The RI flow diagrams, function- and circuit diagrams, layout plans, terminal-cable-, pipe- and strip map diagrams must be drawn up to the latest EN-standards

All the information and data directly related to the unit such as drawings, lists etc. must be delivered both on CD or DVD and in 3-fold paper copy; further information – such as operating instructions, catalogues etc. must also be delivered in 3-fold copy.

The documentation must correspond to the actual unit as built.

All the start-up test certificates must be included

All standard parts (bearings, chains, belts, cylinders, valves etc...) must be listed in the parts list complete with standard term and make as stated in the appendix.

Lubrication- and maintenance plans must be drawn up for the whole unit. Mere information as to the relevant data of the sub-contractor is not sufficient. A revised set must be always be at hand at the unit up until the final delivery of the final documentation (date due: when the unit is certified).

To be included in the documentation:

- List of components including parts list
-
- Completion certificate
-
- Gears list
-
- Motor list
-
- Belt list
-
- List of heating elements
-
- Bearing list (roller bearing, friction bearing etc.)
-
- Diagrams (pneumatic-plan, hydraulic-plan, circulation-systems etc.)