Technical Specifications

These specifications define the material, technical data, fitting instructions and quality checks for our PTFE-, PFA- or PP-lined pipes and fittings according to DIN 2848 and DIN 2874.

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1. Materials

1.1 Steel parts

1.1.1 All steel pipes meet:

carbon steel	DIN EN 10217-2
	DIN EN 10216-2
stainless steel	DIN EN 10217-7
	DIN EN 10216-5

1.1.2 Flanges and stub-ends comply with:

DIN EN 1092-1

1.1.3 Fittings comply with:

carbon steel	DIN EN 10253-2
stainless steel	DIN EN 10253-4

1.2 Lining

1.2.1 Polytetrafluoroethylene (PTFE)

The lining is made from virgin PTFE without any pigments. The minimal material characteristics according to DIN 2874 are:

Tensile strength	26 N/mm²
Elogation	275%
Specific gravity	2,14 - 2,2 g/cm³
Colour	white

1.2.2 Perfluoroalkoxy (PFA)

The injected material is pure PFA without any pigments. The minimal material characteristics according to DIN 2874 are:

Tensile strength	21 N/mm²
Elogation	300%
Specific gravity	2.12 - 2.16 g/cm³
Colour	white opaque

1.2.3 Polypropylen (PP)

All PP lining is made according to DIN 8078 Type 2. The material characteristics are:

Tensile strength	26 N/mm²
Elogation	120%
Specific gravity	0.91 g/cm³
Colour	grey

1.2.4 Conductive lining

Upon request the PTFE and PFA lining can also be manufactured as conductive lining. The colour is deep black. The vertical resistance according to DIN EN 62631-3 does not exceed 108 Ohm at any place.

1.2.5 FDA conformity

Upon customer request the lining of our piping parts complies to the regulations of the Food and Drugs Administration (FDA).

1.2.6 Food Regulatory Declaration of Compliance

Upon request, we will prepare for our customers a Food Regulatory Declaration of Compliance for plastic materials intended for use in the food industry.

1.3 External Coating

1.3.1 Sandblasting

All carbon steel parts are sandblasted according to SA 2.5.

1.3.2 Paint coating

All PTFE-lined carbon steel products are painted with an epoxy-zinc-chromate primer to protect them from corrosion. Special painting on request.

2. General technical data

2.1 Pressure Equipment Directive (PED) 2014/68/EU

The piping parts are manufactured within the Pressure Equipment Directive. They fulfill all requirements of construction, manufacturing and testing. We can issue a declaration of conformity for modules A, A2, B+D, (B+C2), and G for the categories I to IV. We are also authorized to use the CE marking.

2.2 Steel pipe dimensions

The outer pipe dimensions comply with DIN EN 10220.

2.3 Flange connections

Flange connections comply with

DIN EN 1092-1.

2.4 Weights of lined pipes and fittings

Please refer to the corresponding data sheets.

2.5 Vent holes

Vent holes should be kept open at all times. They have a dual function. First, they allow any permeating gas to escape. Second, they serve as leakage indicators to ensure rapid repair.

2.6 Protective covers

Flares are protected with water proof plywood covers or plastic caps. All bolts and nuts are galvanized and can easily be loosened.

2.7 Liner thickness

Various operating conditions require different liner thickness. In practice, however, thicker linings offer better safety under vacuum, better resistance against abrasion as well as lower gas permeability.
The determination of a suitable lining thickness for a piping part happen in consideration of operating conditions, custom specifications or special requests. In accordance with DIN 2874 the lining thickness must be at least 3 mm.

2. General technical data

2.8 Operating temperatures

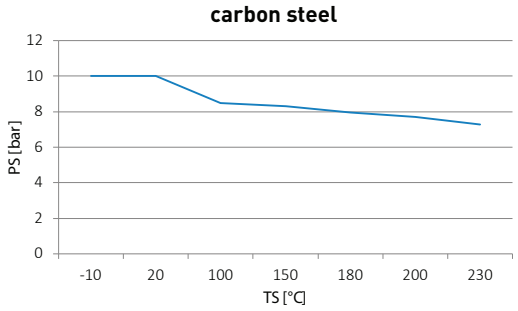
Maximum operating temperatures are:

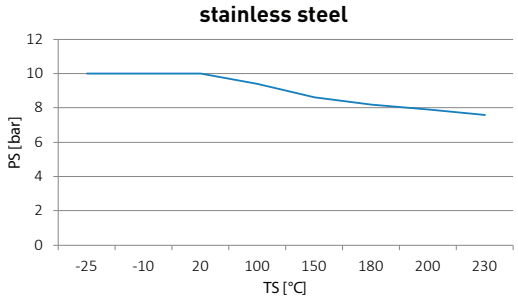
PTFE 230 °C
PFA 230 °C
PP 100 °C

These temperatures only apply under optimum conditions. Special demands may require a reduction in vacuum and pressure.

2.9 Temperature ratings

The interrelationship between nominal pressure and operating temperature according to DIN EN 1092-1 and operating limits of piping parts is shown below. Possibly in some cases it may deviate from the pressure-temperature-rating.





2.10 Operating pressures

The design meets the requirements of pressure levels PN 10, PN 25 and PN 40 according to DIN 2848. Other operating pressures are available upon request in special versions.

2.11 Vacuum resistance

The vacuum resistance of the lined piping parts is determined by production technology and liner thickness. Based on your operating environment we can define the optimal liner thickness for your application. The values for vacuum resistance are given in the corresponding data sheets.

2.12 Tolerances

Tolerances are defined in:

DIN EN 10220
DIN 2848
DIN 2874

3. Quality management

3.1 Welding

Our welding processes are subject to the following criteria:

1. We are a certified manufacturer in accordance with AD 2000-Merkblatt HP 0, HP 100 R / DIN EN ISO 3834-2 / DIN EN 13480.
2. Our processes conform to AD 2000-Merkblatt HP 2 / 1 / DIN EN 13480.
3. Our operations are supervised by a certified welding expert.
4. We only employ welders with a AD 2000-Merkblatt HP 3 / DIN EN 13480 certificate.

3.2 Material quality certificates BAUMCert®

All steel pipes, flanges, stub ends and welded steel fittings are certified according to DIN EN 10204 - 3.1.

3.3 Raw material checks

Lining materials are only procured with material quality certificates WAZ 2.2 from manufacturers certified according to ISO 9001.

3.4 Visual and dimensional checks

In addition, our own laboratory continually checks and records the physical data of semifinished products from the production line. The dimensions of all pipes and fittings are checked visually.

3.5 Spark tests

All non-conductive lined pipes and fittings subjected a 25kV or 30kV spark test to make sure the lining is not porous.

3.6 Hydrostatic tests

The hydrostatic test is carried out at the 1.43-times of the nominal pressure.

3.7 Marking

In accordance with DIN 2874, every pipe and fitting is marked on the circumference of the flange as follows:

- Manufacturer's name
- Nominal pipe size
- Production lot
- Lining material
- DIN 2848
- Non-chargeability of the lining
- Date of production
- CE marking (if applicable)

Additional markings - for example material no. etc. – are available upon customer request.