5.4 MATERIALS AND COATINGS

5.4.1 BODY MATERIALS

Bodies are fully corrosion protected inside by the rubber lining and outside by a coating (bronze bodies are uncoated).

Type of material	Typical applications	Material designation		PED category	WWE material code
		EN / DIN	Comparable ASTM:		
Ductile cast iron (GGG 40)	Normal applications	JS 1030, EN 1563	A 395, 60-40-18	I, II, III	M03
Ductile cast iron (GGG 40.3)	Heavy duties Cold applications (Petro-)chemical industries	JS1049, EN1563 (GJS-400-18U-LT)	–	II, III	M85
Grey cast iron (GG25)	Light applications Not suitable for pressure shocks or rapid closing valves	JL 1040, EN 1561	A 126, Class B.	I	M01
Carbon steel	Heavy duties (Petro-)chemical industries	GP240GH, EN10213-2 (1.0619)	A216, WCB	II, III	M22
Bronze casting (RG 10)	Shipbuilding/Marine applications	C-CuSn10Zn, DIN 1705	B584, C90500	I	M29

5.4.2 EXTERNAL BODY COATINGS

Type of coating	Colour	Typical environments/applications acc. ISO 12944-2		WWE code
		Exterior	Interior	
Polyurethane coating	Orange, RAL 2000 (100 µm) Options: • PUR Blue, RAL 5017 • PUR Red, RAL 3000 • PUR Grey, RAL 7000 • PUR1 (120 µm)	Urban and industrial atmospheres, moderate sulphur dioxide pollution. Coastal areas with low salinity	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries	PUR (Option PUR 1)
Epoxy coating	Black, RAL 9011 (150 µm) Options: • With extra polyurethane toplayer for other colour requirements • Black, RAL 9011 (300 µm)	Industrial areas with high humidity and aggressive atmosphere. Coastal and offshore areas with high salinity* Buried in soil.	Buildings or areas with almost permanent condensation and with high pollution –	EP 1 EP 2
Epoxy primer	Beige, RAL 1001 (50 µm)	As primer for further coating by the end user	EP	

- Other coating systems on request.
- A Rilsan coating (blue) is available on some valve types.

5.4.3 BODY LINING MATERIALS

Wouter Witzel EuroValve has invested heavily in research into formulation of rubber types and so developed 'in-house' expertise in rubber technology. The quality of rubber compounds is fundamental to the performance and reliability of the Wouter Witzel® valve ranges. The rubber lining has 3 important functions:

- Protection of the body against corrosion and erosion by the fluid
- Resilient seating material
- Flange gasket sealing

Important: It is essential that for each individual case the selection of the type of rubber complies with the fluid characteristics and available experience.
A wrong selection may cause failure of the valve. The given temperature limits shall be used as guide lines. The suitability of a type of rubber depends on the actual service conditions such as working pressure, peak temperatures and the nature of both the process fluids and any cleaning medium etc. In case of doubt please contact Wouter Witzel EuroValve for advice.

5.4.3 RUBBER TYPES

Material Standard ISO 1629	Grade of material	Examples of application	WWE Material Code
NBR	**Standard grade**	• Alphatic hydrocarbons (low aromatic containing fuels, oils and gases) • Animal fats • Seawater • Compressed air, powder and granulars convey Temperature indication: 0 ↔ 90 °C	M203
EPDM	**Standard grade**	• Water in general (hot-, cold-, sea-, ozone-, swimming-, glycolized-, industrial-) • Potable water • Foodstuffs (including vegetable oils and fats) • Weak acids, weak salt solutions, alcohols, ketones, sour gases Temperature indication: –20 ↔ 110 °C	M16
EPDM	**Special grade**	• Potable water • Foodstuffs • Open water systems • Unchlorined drinking water Temperature indication: 0 ↔ 70 °C	M201
EPDM	**Special grade** (with a wide temperature range)	• HEVAC (hot water service) • Chilled water • Food stuffs & Sugar juice Temperature indication: –30 ↔ 120 °C	M23
FPM	**Standard grade** (B type)	• Many aliphatic, aromatic, and halogen hydrocarbons when EPDM or NBR is not suitable • Hot gases (Not for aequous fluids) Temperature indication: 0 ↔ 200 °C	M113
FPM	**Special grade** (GF type) with high chemical resistance	• Concentrated acids Temperature indication: 0 ↔ 150 °C	M56
VQM	**Special grade** (silicon, high temperature, low pressure)	• Air (high temperature) Max. pressure 2.5 bar Temperature indication: 0 ↔ 180 °C	M141

On request, the following approvals are available:

- KIWA/EN 681-1
- FDA§177.2600
- WRAS, BS 6920
- KTW D1, D2
- W270
- ACS, XP P 41-250
- NSF Standard 61
- AS/NZS 4020
- Belg AQUA
- DVGW Gas/EN 682

5.4.4 DISC MATERIALS

As the disc is a process wetted part the material should be carefully selected.
Wouter Witzel EuroValve can supply the following materials:

Type of material	Typical applications	Material designation		PED category	WWE material code
		EN / DIN	Comparable ASTM:		
Austenitic stainless steel > DN 450 (> 18'')	Potable water, cooling water, sea water, demineralized water, solvents, foodstuff	1.4408, EN 10213	A351, CF8M	II, III	M14
Duplex stainless steel DN 50 – 2200 (2'' – 88'')	Potable water, cooling water, chlorinated water, sea water, demineralized water, solvents, foodstuff, biogas	1.4462, EN 10088 >600: 1.4517, EN 10213		II, III	M50 M97
Martensitic stainless steel DN 50 – 450 (2'' – 18'')	Non corrosive hot or cold water, solvents, fuels, air, abrasive duties (slurries, dry powders, granulates), gas	1.4057, EN 10088	A276, Grade 431	I	M52
Ductile cast iron with Rilsan coating (GGG 40) DN 250 – 2200 (2'' – 88'')	Water incl. potable water, KIWA, BGA, KTW, FDA, WRAS approved Up to 70 °C	JS 1030, EN 1563	A395, 60-40-18	I	M03
Aluminium bronze AB2 DN 50 – 2200 (2'' – 88'')	Sea water, potable water, gas	G-CuAl10Ni, DIN 1714	B148, C95800	I	M20
Hastelloy-C®	Phosphoric, hypochloric, acetic, formic, sulfurous acids	–	A494, CW-12MW	II, III	M77
Super Duplex stainless steel DN50 – 2200 (2''- 88'')	desalination, seawater	1.4469, EN 10213	A890	II, III	M151

Note: Other materials (eg Uranus B6) are available on request.

5.4.5 SHAFTS AND PIN MATERIALS

Materials for shafts and tapered pins are selected on the basis of disc materials.

Type of material	in combination with disc material	Material designation		PED category	WWE material code
		EN / DIN	Comparable ASTM:		
Duplex stainless steel DN 50 – 2200 (2'' – 88'')	Duplex stainless steel or austenitic stainless steel	1.4462, EN 10088	A276, S31803	II, III	M50/81
Martensitic stainless steel DN 50 – 2200 (2'' – 88'')	Martensitic stainless steel Ductile cast iron	1.4057, EN 10088	A276, Grade 431	I	M52
Aluminium bronze DN 50 – 2200 (2'' – 88'')	Aluminium bronze	CuAl10Ni5Fe4 / EN DIN 17665	B150, C63000	I	M31
Monel K500®	Aluminium bronze (high pressures)	NA 18, BS 3076		I	M17
Hastelloy C276®	Hastelloy C	–	B547, N10276	II, III	M77
Super Duplex stainless steel DN 50 – 2200 (2'' – 88'')	Super Duplex stainless steel	1.4501, EN10272	-	II, III	M140

Note: Other materials (eg Uranus B6) are available on request.