



Sealing Fundamentals



Requirements

Water – Rain or wash-down, the degree of protection is usually specified by a NEMA, IP or other standard.

Dust – This is rarely a factor

Other fluids – machine tool cutting fluid

Gas – Some enclosures made for explosive environments pressurize the enclosure with inert gas to prevent ingress of explosive gas.

The two main areas of potential leakage are:

- Around the latch
- Through the latch
- Around the door

The sealing performance must last the expected life of the enclosure.

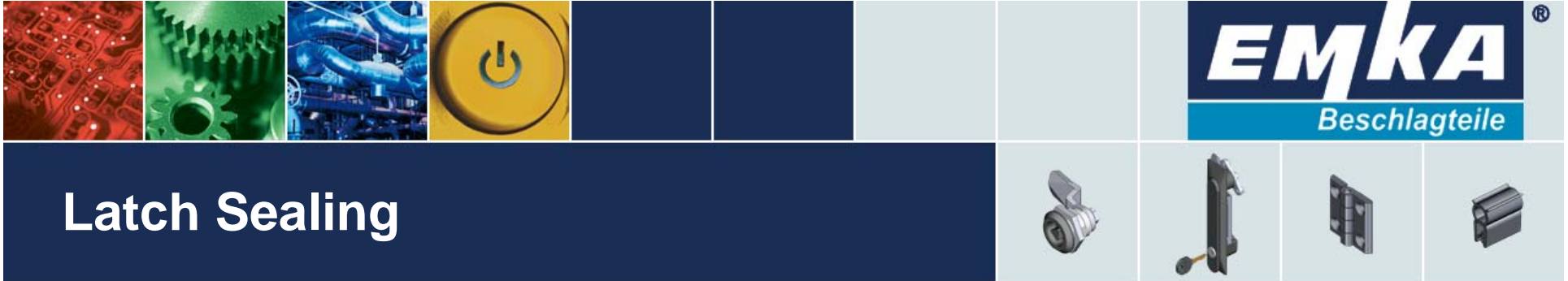


Sealing



Standards

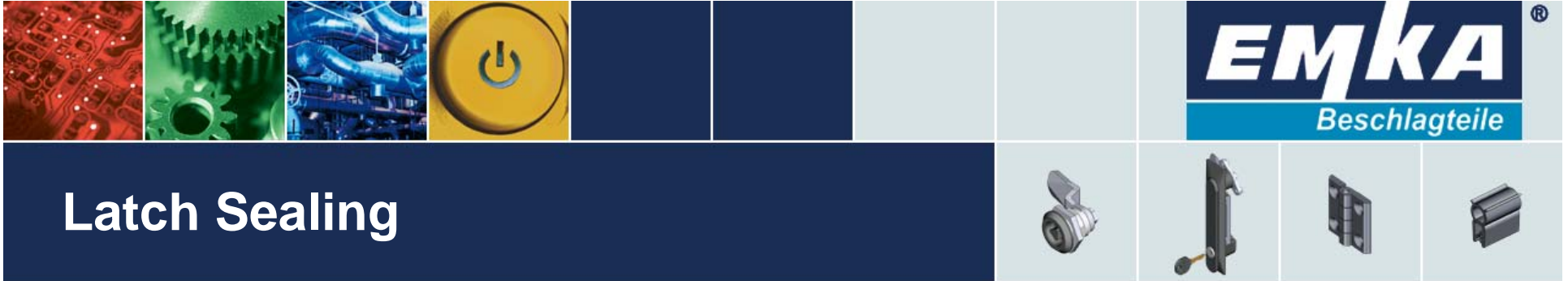
Standard	Protection against	Other
NEMA 4 & 4X / UL 50	Hosed and splashing water	4X includes corrosion resistance
NEMA 3	Rain	Dust protected
NEMA 12	Dripping liquids	Dust protected
GR 487	70 MPH wind-driven rain	Dust protected
IP 54	Splashing water	Dust protected
IP 65	Water jets	Dust protected
IP 66	Powerful water jets	Dust protected



Latch Sealing

Around the latch – Almost all EMKA quarter turn latches and swinghandles use a polyurethane Foam-in-Place gasket for NEMA 4, 4X, GR 487, and IP 66 enclosures.

- Improved quality - Gasket cannot be omitted by mistake.
- Separate gasket can be extruded or damaged during installation.
- Longer life - The urethane will last longer than materials under almost all conditions, see UL Ref. # JMST2.MH26871
- Reduced costs - Quicker, easier installation, particularly on swing handles.
- One fewer part to inventory.
- Better sealing - Material is very compliant and so conforms to an imperfect door surface.
- Gasket is wide, it will seal on oversized cut-outs.



Latch Sealing

Through the latch

All EMKA quarter turn latches can be supplied with an internal O-ring for NEMA 4, 4X, GR 487, and IP 65 enclosures. For even better sealing – up to IP69 Consult EMKA.

All EMKA Swinghandles can be sealed for NEMA 4, 4X, GR 487, and IP 65 enclosures. For even better sealing – up to IP69 Consult EMKA.

Many other latches are sealed similarly including flush paddle and “T” handles and those for insulated doors



Sealing - Around the Door



“Bubble” type gasket is strongly recommended

No Adhesive:

therefore no surface cleaning, no uncertainty

Only one joint - Reduced chance of leaks

Low compression force to seal

EPDM is best material available for long life (no oil) –
used on roofs guaranteed for 30 years.

NBR excellent material for oil resistance plus
weathering

No “pull back” at the corners



Side bubble



Top bubble





Door Gasketing – Material Properties



Operating Temperatures	EPDM	Nitrile (NBR)	Chloroprene (Neoprene)
Minimum °F / °C	-60 / -50	-40 / -40	-45 / -42
Maximum °F / °C	300 / 150	250 / 120	250 / 120
Chemical Resistance			
Weathering	E	G	G - E
Ozone	E	P	G
Oils	P	E	G - E
Acids	F	G	F - G
Alcohols	E	G - E	G - E
Polar Solvents (ketones)	P	E	P
Water	E	G	G
Mechanical Properties			
Compression set	G	G	F - G
Abrasion resistance	G	G - E	G - E

This table is a guide only. We strongly advise testing under conditions as close to real life as possible.