

# Highpreactor

## Material of Construction | Sealing

### Materials of construction

Designation	Trade name	DIN Mat. No.	UNS
	SS 316 TI	1.4571	
	Hastelloy <sup>→</sup> C-4 (Alloy C-4)	2.4610	N06455
	Hastelloy <sup>→</sup> C-22 (Alloy C-22)	2.4602	N06022

Chemical Composition	Major elements [%]						
		Cr	Mo	W	Fe	Ni	Other
SS	17.5	2.25	-	65.6	11.5	Mn, C, Si	
C-4	16	16	-	3	63.2	Ti, Mn, C, Si	
C-22	22	13	3	3	58	V, Mn, C, Si	

### Physical-chemical properties

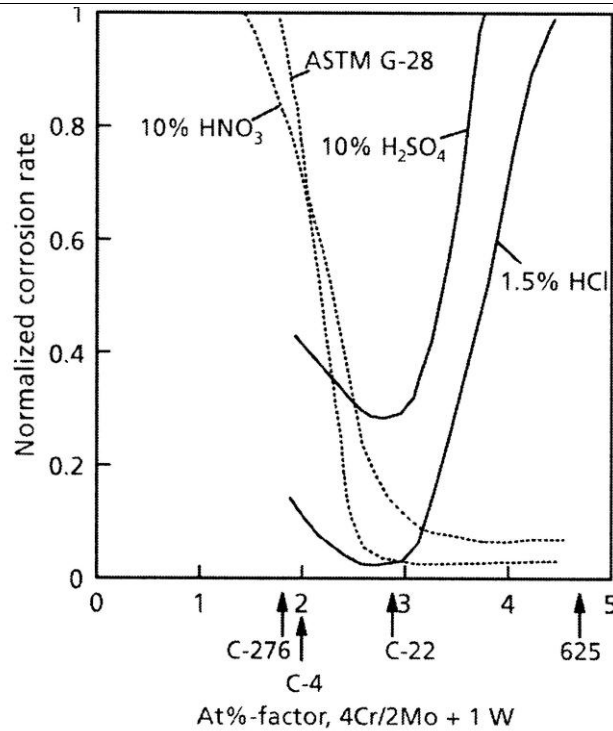
#### Stainless steel (SS 316 TI)

Stainless steels are Iron-based alloys with at least 12% Chromium. Corrosion resistance is a function of composition, heat treatment, surface condition and fabrication. Chromium is the essential element in forming a passive film spontaneously with oxygen. Higher Chromium contents (maximum is approx. 30%) leads to improved passivation and corrosion resistance.

#### Hastelloy<sup>→</sup> C-4 and C-22

Hastelloy C-4 and C-22 are both representatives of the highly corrosion resistant Nickel-Chromium-Molybdenum alloys with increased pitting and crevice corrosion resistance. The atomic composition of the relevant elements defines the corrosion rate (see diagram, wherein  $APF = 4 Cr / (2 Mo + 1 W)$ ).

A high resistance to oxidising acids is achieved at high APF and to reducing acids at low APF. This shows clearly that C-22 has optimum corrosion resistance with respect to oxidising and reducing acids. Hastelloy C-4 and C-276 have virtually the same corrosion resistance.



Due to the broad chemical resistance, these alloys are second most important alloys, following SS 316 Ti, in chemical technology

Materials of sealing			
Designation	ISO Symbol	Trade names	Temperature Resistance
	PTFE	Lubriflon <sup>→</sup> , Teflon <sup>→</sup> , Hostafilon <sup>→</sup> , Fluon <sup>→</sup>	-200 to +260°C (short term 280°C)
	FPM	Viton <sup>→</sup> (Flourel <sup>→</sup> , Tecnoflon <sup>→</sup> )	-20 to +200°C (short term 250°C)
	FFKM	Kalrez <sup>→</sup>	-20 to +316°C
Physical-chemical properties			
<b>PTFE</b>	Polytetrafluorethylene (PTFE) is a linear, perfluorinated polymer with the following formula – [CF <sub>2</sub> –CF <sub>2</sub> ] <sub>n</sub> –. PTFE is far the most important fluoroplastic with exceptional properties: <ul style="list-style-type: none"> <li>- PTFE is temperature resistant between –200 and +250°C</li> <li>- PTFE is virtually universal resistant to chemicals. Care is only necessary with elementary fluorine, chlorine trifluoride, alkali metals (dissolved or molten) and fluorinated hydrocarbon. Hard (energetic) radiation decomposes PTFE.</li> <li>- PTFE has an extremely low coefficient of friction, thus eliminating any stick/slip effect</li> <li>- PTFE is extremely anti-adhesive</li> </ul>		
<b>FPM (e.g. Viton<sup>→</sup>)</b>	FPM is a elastomeric fluor-rubber with outstanding chemical and thermal properties. <ul style="list-style-type: none"> <li>- FPM is temperature resistant between –20 and +200°C (short time +250°C)</li> <li>- FPM has a good chemical resistance to chemicals. It is resistant to mineral, vegetable and animal oils, fuels, many alkaline solutions, acids and solvents.</li> </ul>		
<b>FFKM (e.g. Kalrez<sup>→</sup>)</b>	FFKM is also a elastomeric fluor-rubber with extreme chemical and thermal properties. <ul style="list-style-type: none"> <li>- FFKM is temperature resistant between –20 and +316°C</li> <li>- FFKM has a superior chemical resistance to chemicals comparable with PTFE.</li> </ul>		