

ATEX Marking Information for Gear Pumps

Table 1: Temperature Limits for **Liquiflo Gear Pumps**

ATEX Temperature Class	Maximum Surface Temperature	Maximum Product Temperature	Gear Pump Series (includes all models)
T2	300°C (572°F)	260°C (500°F)	MAX [®] Series, H-Series, 3-Series, 4-Series, 2-Series
T3	200°C (392°F)	189°C (372°F)	--
T4	135°C (275°F)	93.3°C (200°F)	Poly-Guard [®] Series (PFA-Lined)
T5	100°C (212°F)	89°C (192°F)	--

Note: For pumps with heating jackets, the temperature of the heat transfer fluid must not exceed the Maximum Product Temperature.

Table 2: Temperature Limits for **Gears**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Double Metal	260°C (500°F)	271°C (520°F)	T2
Carbon	260°C (500°F)	271°C (520°F)	T2
B. G. PEEK	204°C (400°F)	216°C (420°F)	T2
Virgin PEEK	204°C (400°F)	216°C (420°F)	T2
Ryton [®]	149°C (300°F)	160°C (320°F)	T3
Kynar [®]	110°C (230°F)	121°C (250°F)	T4
G. F. Teflon [®]	110°C (230°F)	121°C (250°F)	T4

Table 3: Temperature Limits for **Wear Plates**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Silicon Carbide	260°C (500°F)	271°C (520°F)	T2
Carbon	260°C (500°F)	271°C (520°F)	T2
B. G. PEEK	232°C (450°F)	243°C (470°F)	T2
Virgin PEEK	232°C (450°F)	243°C (470°F)	T2
G. F. Teflon [®]	127°C (260°F)	138°C (280°F)	T3

Table 4: Temperature Limits for **Bearings**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Silicon Carbide	260°C (500°F)	271°C (520°F)	T2
Carbon	260°C (500°F)	271°C (520°F)	T2
B. G. PEEK	177°C (350°F)	188°C (370°F)	T3
Virgin PEEK	177°C (350°F)	188°C (370°F)	T3
G. F. Teflon®	82°C (180°F)	93°C (200°F)	T5

Table 5: Temperature Limits for **Shafts**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Metal (uncoated)	260°C (500°F)	271°C (520°F)	T2
Tungsten Carbide Coated	260°C (500°F)	271°C (520°F)	T2
Chrome Oxide Coated	260°C (500°F)	271°C (520°F)	T2
Titanium Dioxide Coated	260°C (500°F)	271°C (520°F)	T2
Silicon Carbide	260°C (500°F)	271°C (520°F)	T2

Table 6: Temperature Limits for **O-Rings & Gaskets**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Graphoil	454°C (850°F)	271°C (520°F)	T2
Kalrez® (FFKM)	316°C (600°F)	271°C (520°F)	T2
Teflon® (PTFE)	260°C (500°F)	271°C (520°F)	T2
SS/FEP	260°C (500°F)	271°C (520°F)	T2
Silicone/PFA	260°C (500°F)	271°C (520°F)	T2
Silicone/FEP	204°C (400°F)	216°C (420°F)	T2
Viton® (FKM)	204°C (400°F)	216°C (420°F)	T2
EPDM	149°C (300°F)	160°C (320°F)	T3
NBR (Buna-N)	107°C (225°F)	118°C (245°F)	T4

Table 7: Temperature Limits for **Mechanical Seals (Face-Seat-Wedge)**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Carbon / SiC / Graphoil	260°C (500°F)	271°C (520°F)	T2
SiC / SiC / Graphoil	260°C (500°F)	271°C (520°F)	T2
Carbon / SiC / PTFE	177°C (350°F)	188°C (370°F)	T3
SiC / SiC / PTFE	177°C (350°F)	188°C (370°F)	T3
PTFE / SiC / PTFE	82°C (180°F)	93°C (200°F)	T5

Table 8: Temperature Limits for **Packing Rings**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Graphoil	260°C (500°F)	271°C (520°F)	T2
Braided Teflon®	177°C (350°F)	188°C (370°F)	T3

Table 9: Temperature Limits for **Containment Can & Housing Linings**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
PFA Lining	93°C (200°F)	104°C (220°F)	T4
Teflon® (PTFE) Lining	93°C (200°F)	104°C (220°F)	T4

Table 10: Temperature Limits for **Bearing Pins**

Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Metal	260°C (500°F)	271°C (520°F)	T2
Teflon® (PTFE)	149°C (300°F)	160°C (320°F)	T3

Table 11: Temperature Limits for **Magnetic Couplings**

Magnet Material	Material Temperature Limit	Surface Temperature Limit	ATEX Temperature Class
Samarium Cobalt (SmCo)	260°C (500°F)	271°C (520°F)	T2
Neodymium Iron Boron (NdFeB)	121°C (250°F)	132°C (270°F)	T4

Table 12: Material Descriptions for **Nonmetal Components**

Material	Composition	Component(s)
B. G. PEEK	Bearing Grade PEEK (Poly-Ether-Ether-Ketone) Plastic; 10% Graphite/10% Carbon Fiber/10% PTFE-Filled	Gear, Bearing & Wear Plate
Virgin PEEK	PEEK (Poly-Ether-Ether-Ketone) Plastic, 100%; FDA Grade	
G. F. Teflon®	PTFE Plastic, 25% Glass-Filled	
Ryton®	Poly-Phenylene Sulfide (PPS) Plastic; 25% Glass/15% PTFE-Filled	Gear
Kynar®	Poly-Vinylidene Fluoride (PVDF) Plastic, 100%; FDA Grade	
PFA	Per-Fluoro-Alkoxy (Fluoropolymer) Plastic; 1% TiO ₂ Filled	Pump Lining
Teflon® (PTFE)	Poly-Tetra-Fluoro-Ethylene (Fluoropolymer) Plastic, 100%; FDA Grade	Cont. Can Lining, Seal Face, Seal Wedge, O-Ring & Bearing Pins
Braided Teflon®	PTFE with lubricant	Packing Ring
Graphoil	Graphite Flake, 97-98%, with oxidation/corrosion inhibitors	Packing Ring, Seal Wedge & Gasket
Carbon	Graphite, 100% (Acid Grade); Carbon 60 is Liquiflo designation	Gear, Bearing, Wear Plate & Seal Face
Silicon Carbide	α -SiC, 100% (Self-Sintered)	Shaft, Bearing, Wear Plate, Seal Face & Seal Seat
Tungsten Carbide	73% WC/20% Chromium Carbide (Cr ₃ C ₂)/7% Nickel	Coating for Metal Shaft
Chrome Oxide	99.88% Cr ₂ O ₃ /0.01% free Cr/0.11% other Oxides	
Titanium Dioxide	60% Alumina (Al ₂ O ₃)/40% Titania (TiO ₂)	
Kalrez® (FFKM)	Perfluorinated Elastomer; 4079 Grade or equivalent is standard; 1050LF Grade or equivalent is optional	O-Ring
Viton® (FKM)	Fluorocarbon Elastomer; Type A is Standard Grade	
EPDM	Ethylene-Propylene-Diene Monomer (Elastomer); Sulfur-free	
NBR (Buna-N)	Nitrile-Butadiene Rubber (Elastomer)	
SS/FEP	Stainless Steel Spring/Fluorinated-Ethylene-Propylene (Fluoropolymer) Plastic-Encapsulated	Encapsulated O-Ring
Silicone/PFA	Silicone Rubber/PFA Plastic-Encapsulated	
Silicone/FEP	Silicone Rubber/FEP Plastic-Encapsulated	