



## **PFPE – Greases FLUORONOX**

**Lubricants  
Special Lubricants**

## **PERFLUOROPOLYETHERS**

are liquid polymers, consisting of carbon, fluorine and oxygen.

The polymer chain differs in length of the C-C-chain, in its structure of the carbon-fluorine- oxygen-chain and in its manufacturing process.

The fluorine counts for many of the Perfluoropolyether's typical characteristics. It increases the chemical, thermal and mechanical stability of the molecule chain.

The most significant properties of non additivated Perfluoropolyethers are:

- high thermal stability
- high load carrying properties
- high resistance to chemicals
- high resistance to water and steam
- high oxidation resistance
- high density
- high wetting properties
- low vapour pressure
- excellent compatibility to non-fluorinated elastomers and plastics
- excellent compatibility to metals
- wide temperature range
- low or no toxic potential

In the manufacturing process of our PFPE-greases and PFPE-oils, **TECCEM GmbH** processes virginal raw materials only, no regenerated materials. All thickeners are coming from well known manufacturers, currently from Germany, Italy and Japan. In case that additives are incorporated, we only use temperature stable types, which do not reduce the upper useful temperature range.

### **Our manufacturing programme of PFPE-greases includes the following categories:**

- High temperature, low temperature and multigrade greases without additives
- Chemical inert greases
- Vacuum greases
- Multigrade greases with enhanced corrosion protection
- High temperature greases with enhanced wear protection
- High temperature, low tempweature and multigrade greases without drop point
- Greases for lubricating micro porous surfaces
- Application related developments and custom made products

## GREASES WITHOUT ADDITIVES

This series of greases consists of classical Perfluoropolyether Greases. They do not contain any additives, which could provide a negative effect on vapour pressure, chemical inertness or compatibility to elastomers. They are manufactured of virginal PFPE and micro fine PTFE.

The products are especially suitable for lubrication of O-Rings, elastomers, packings, as multi-purpose grease for lubricating all kind of parts in the chemical industry and for lubricating production machines in the electronic industry.

### High and Low Temperature Greases

Typical Technical Data	FLUORONOX L 20/1	FLUORONOX M 30/2	FLUORONOX M 40/2	FLUORONOX M 50/2	FLUORONOX S 90/2
Penetration [mm/10]	310-340	265-295	280-300	265-295	265-295
Pour Point Base Fluid [°C]	-70	-30	-25	-20	-12
Viscosity Index	210	120	135	135	145
Density [g/ml] @20°C	1,85	1,92	1,92	1,92	1,92
Flash Point [°C]	none, non-flammable	none, non-flammable	none, non-flammable	none, non-flammable	none, non-flammable
Appearance	white	white	white	white	white
Base Fluid	Perfluoro- polyether	Perfluoro- polyether	Perfluoro- polyether	Perfluoro- polyether	Perfluoro- polyether
Thickener	PTFE	PTFE	PTFE	PTFE	PTFE
Base Fluid Viscosity [mm <sup>2</sup> /s] @20°C @40°C @100°C @200°C	39 20 5 --	480 155 16 4	1500 420 41 6	1850 510 47 7	2537 790 80 12
Evaporation Rate Base Fluid [%] in 22h @120°C [%] in 22h @204°C [%] in 22h @250°C	2,0	-- 2,0	-- 0,8	-- 0,5	-- -- 0.5
Vapour Pressure Base Fluid [Torr] @20°C	not tested	2,4 x 10 <sup>-8</sup>	4,0 x 10 <sup>-10</sup>	3,0 x 10 <sup>-12</sup>	5,0 x 10 <sup>-15</sup>
Temperature Range Longtime Lubrication [°C] Maximum Temperature [°C]	-60/+130 +230	-25/+220 +290	-20/+260 +290	-15/+280 +290	-5/+280 +290

## Multigrade Greases

- Fluoronox MS 10/2 for lubricating O-Rings, elastomers and fine mechanical parts
- Fluoronox MS 20/2 for lubricating O-Rings, elastomers, rolling bearings, slide bearings
- Fluoronox MS 30/2 for lubricating O-Rings, elastomers, rolling bearings, slide bearings, NSF H1 registered
- Fluoronox WT 30/2 as multi-purpose grease for extreme temperature changes and for high loads at high temperatures

Fluoronox WT 70/2 as multi-purpose grease for extreme temperature changes and for very high loads at high temperatures

Typical Technical Data	FLUORONOX MS 10/2	FLUORONOX MS 20/2	FLUORONOX MS 30/2	FLUORONOX WT 30/2	FLUORONOX WT 70/2
Penetration [mm/10]	280-300	280-300	265-295	265-295	265-295
Pour Point Base Fluid [°C]	-60	-50	-50	-65	-50
Viscosity Index Base Fluid	204	190	190	338	375
Density [g/ml] @20°C	1,88	1,88	1,88	1,88	1,90
Flash Point [°C]	none, non-	none, non-flammable	none, non-flammable	none, non-flammable	none, non-flammable
Appearance	white	white	white	white	white
Base Fluid	Perfluoro-polyether	Perfluoro-polyether	Perfluoro-polyether	Perfluoro-polyether	Perfluoro-polyether
Thickener	PTFE	PTFE	PTFE	PTFE	PTFE
Base Fluid Viscosity [mm <sup>2</sup> /s]					
@20°C	166	255	351	280	1300
@40°C	72	98	140	159	700
@100°C	14	16	23	45	200
@200°C	3	4		13	51
Evaporation Rate Base Fluid [%] in 22h @204°C	12	1,5	0,7	0,7	0,4
Temperature Range Longtime Lubrication [°C]	-50/+150	-45/+160	-45/+230	-60/+250	-45/+260
Maximum Temperature [°C]	+260	+260	+260	+260	+260

## Special Greases for the Optical Industry

Greases of this series are free of PTFE and free of metal soaps. They do not build up tenacious residues in oscillating parts and show very low inner friction at the same time. The fine particle size of the thickener, combined with special fluids make them suitable for lubricating anodised and other micro porous metals, from low to high speeds. The low vapour pressure of the base fluid reduces the risk of oil fumes, keeping the optical elements free of oil condensate.

- Free of PTFE and metal soaps
- Does not build up tenacious residues
- Suitable for lubricating micro porous surfaces
- Provides low vapour pressure
- Suitable for a wide temperature range

Typical Technical Data	FLUORONOX GE50/2-3	FLUORONOX GES50/2-3
Penetration [mm/10]	250-265	250-265
Pour Point Base Fluid [°C]	-60	-60
Viscosity Index Base Fluid	343	343
Density [g/ml] @20°C	1,88	1,88
Flash Point [°C]	none, non-flammable	none, non-flammable
Appearance	whitish	black
Base Fluid	Perfluoropolyether	Perfluoropolyether
Thickener	inorganic	inorganic
Base Fluid Viscosity [mm <sup>2</sup> /s]		
@-40°C	6476	6476
@ 0°C	1086	1086
@20°C	550	550
@40°C	310	310
@100°C	86	86
Evaporation Rate Base Fluid [%] in 22h @204°C	0,4	0,4
Temperature Range Longtime Lubrication [°C] Maximum Temperature	-55/+250 +260	-55/+250 +260



## Special Types

### Greases for various speciality applications. Free of PTFE.

Fluoronox G 90/2 has been formulated for applications where the upper temperature can reach +300°C. It shows exceptional high thermal stability and low evaporation rate of the base fluid. When continuously operated at high temperatures, the grease shows little residues when the base fluid evaporates, enabling frequent re-lubrication when desired or easy disassembly.

Fluoronox GV 20/0 is a very soft grease, almost of the consistency of a flow-grease. It has been formulated to serve as a thin film lubricant with exceptional low inner friction

Typical Technical Data	FLUORONOX G 90/2-3	FLUORONOX GV 20/0
Penetration [mm/10]	250-265	355-385
Pour Point Base Fluid [°C]	-12	-70
Viscosity Index Base Fluid	145	210
Density [g/ml] @20°C	1,89	1,82
Flash Point [°C]	none, non-flammable	none, non-flammable
Appearance	whitish	withish
Base Fluid	Perfluoropolyether	Perfluoropolyether
Thickener	inorganic	inorganic
Base Fluid Viscosity [mm <sup>2</sup> /s]		
@20°C	2537	39
@40°C	790	20
@100°C	80	5
Temperature Range Longtime Lubrication [°C] Maximum Temperature [°C]	-5 / +300 +300	-60 / +130 +230



Grindometer  
Measuring the particle size

## GREASES WITH ADDITIVES

### Multigrade Greases with Anti-corrosion and Anti-wear additives

Greases of this series are enhanced with fluorinated additives to protect from wear at high loads, to protect from corrosion in humid or wet environment and to increase the thermal stability, increasing the upper temperature range.

All incorporated additives show high thermal and high oxidation stability as well as high chemical resistance to strong acid and lye.

All greases in this series are based on high viscosity index base fluids. Compared to standard VI-greases they show significantly higher load carrying properties when temperatures exceed +200°C. Further they have fewer tendencies to run out of the bearing at high temperatures.

Greases of the Fluorinox W Series have the following properties:

- Are able to carry high loads at high temperatures
- Provide high corrosion protection
- Are resistant to water, steam and chemicals
- Are suitable for longtime lubrication

Typical Technical Data	FLUORONOX W 40/2	FLUORONOX W 50/2	FLUORONOX W 70/2
Penetration [mm/10]	280-300	280-300	280-300
Pour Point Base Fluid [°C]	-40	-48	-50
Viscosity Index Base Fluid	204	240	375
Density [g/ml] @20°C	1,91	1,90	1,88
Flash Point [°C]	none, non-flammable	none, non-flammable	none, non-flammable
Appearance	white	white	white
Base Fluid	Perfluoropolyether	Perfluoropolyether	Perfluoropolyether
Thickener	PTFE	PTFE	PTFE
Base Fluid Viscosity [mm <sup>2</sup> /s]			
@20°C	800	719	1300
@40°C	277	307	700
@100°C	42	54	200
@200°C	8	11	51
Evaporation Rate Base Fluid [%] in 22h @	0.4	0.4	0.4
Temperature Range Longtime Lubrication [C]	-35/+260	-40/+260	-45/+260
Maximum Temperature [°C]	+270	+270	+270

