

Fomblin PFPE: Additives

Product Data Sheet

Fomblin perfluoropolyethers are a unique line of lubricants offering exceptional chemical resistance, better subzero temperature properties, greater thermal and oxidative stability and lower evaporation loss than almost all other types of formulated lubricants. Though non-reactive themselves, due to their permeability to gases and vapors, Fomblin fluids may not always provide adequate rust protection to metal surfaces. In these applications, often under extreme conditions of oxygen and humidity, it is desirable to enhance Fomblin's performance by a rust preventative additive.

Most of the commonly used lubricant additives are not soluble in perfluorinated lubricants and consequently, are impractical to use with Fomblin. Based on proprietary technology, Solvay Solexis has developed a line of patented PFPE-soluble anti-wear and anti-rust additives. These new soluble additives, "Fomblin DA series", are derived directly from Fomblin's production process and contain functional groups, which can interact with the substrate and thereby improve surface protection.

Fomblin DA 305 is the optimum product for use with greases. Solutions of Fomblin lubricants formulated with 5% (wt.) of DA 305 are clear and stable in storage for over 1 year. These blends can be used in exactly the same manner as non-additivated Fomblin Lubricants for the production of greases. The physical properties of greases additivated with DA 305 remain practically unchanged compared to those of the non-additivated greases; volatility may increase slightly, depending on the base fluid, and oil separation may decrease. Depending on the base fluid, these greases can be used at temperatures ranging from -70°C to +250°C.

Fomblin DA 306 is primarily recommended for formulations with Fomblin Y-LVAC fluids. Solutions of Fomblin lubricants additivated with 5% (wt.) of DA 306 are clear and stable in storage for over 1 year. It imparts anti-rust properties without significantly affecting the volatility and the viscosity of the original fluid, the typical physical properties remaining unchanged. A special grade of DA 306 with very low volatility is also available for lubricants in vacuum pumps. The additive does not significantly affect either the ultimate pressure or the back-migration rate. Fluids additivated with DA 306 can be used at temperatures ranging from -70°C to +250°C.

Fomblin DA 308 is a general-purpose additive for low viscosity fluids. It is recommended for low temperature greases, and is particularly effective in Galden[®] solvents. Solutions of DA 308 in Fomblin at 3% (wt.) are slightly opalescent and are stable for about 4 months. Fluids and greases additivated with DA 308 can be used at temperatures ranging from -70°C to +170°C. Solutions of DA 308 in Galden SV 70 and Perfluorosolv[®] at 3%–8% w/w are clear and stable over 1 year. These solutions can be used to deposit a protective layer on metal parts. The physical properties of non-additivated greases may change by the addition of DA 308. At 3%–5% w/w concentration levels, the volatility may increase by about 1%.

F
O
M
B
L
I
N[®]

For information contact your Solvay Solexis representative or:

Europe

Solvay Solexis S.p.A. (Italy)

Tel: +39-02-3835-1

Fax: +39-02-3835-2129

Email: solvaysolexis.ita@solvay.com

North America

Solvay Solexis, Inc.

Tel: +1-856-853-8119

Fax: +1-856-853-6405

Email: solvaysolexisinfo@solvay.com

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Solexis, Inc. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes.

Trademarks and/or other Solvay Solexis, Inc. products referenced herein are either trademarks or registered trademarks of Solvay Solexis, Inc. or its affiliates.

Copyright 2002, Solvay Solexis, Inc. All Rights Reserved.

Fomblin PFPE: Additives

Product Data Sheet

Property	Unit	DA 305	DA 306	DA 308
Average molecular weight	a.m.u.	3500	3500	300
Kinematic Viscosity @ 20°C	cSt	900	900	30000
Thermal Stability	TGA-DSC	270-300°C	270-300°C	150-170°C
Vapor Pressure @ 20°C	torr	1.5E-06	2.9E-08	1.9E-08
Vapor Pressure @ 100°C	Torr	2.5E-04	1.7E-04	1.5E-04

Fomblin DA 305

Fluid formulation: Base fluid: Fomblin YR
 Concentration of additive: 5% (wt.)
 Thickener: PTFE

AntiRust and AntiWear Properties

Test	Test Conditions		Test Results
	Time	Temperature	
EMCOR (DIN 51802) Distilled water	164 h	ambient	No Rust
ASTM D1743 Water vapor	170 h	50°C	No Rust
FOUR BALL TEST	1 h	75°C	1.0 mm
ASTM D2266	1 h	250°C	1.0 mm

F O M B L I N 

For information contact your Solvay Solexis representative or:

Europe
 Solvay Solexis S.p.A. (Italy)
 Tel: +39-02-3835-1
 Fax: +39-02-3835-2129
 Email: solvaysolexis.ita@solvay.com

North America
 Solvay Solexis, Inc.
 Tel: +1-856-853-8119
 Fax: +1-856-853-6405
 Email: solvaysolexisinfo@solvay.com

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Solexis, Inc. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes.

Trademarks and/or other Solvay Solexis, Inc. products referenced herein are either trademarks or registered trademarks of Solvay Solexis, Inc. or its affiliates.

Copyright 2002, Solvay Solexis, Inc. All Rights Reserved.

Fomblin PFPE: Additives

Product Data Sheet

Fomblin DA 306

Fluid formulation: Base fluid: Fomblin Y & M
Concentration of additive: 5% (wt.)

AntiRust and AntiWear Properties

Test	Test Conditions		Test Results
	Time	Temperature	
Fog Chamber D.I. water, rH 98%	140 h	35°C	No Rust
ASTM D665 Synt.sea water	24 h	60°C	No Rust
ASTM D665 mod. Tap water	24 h	90°C	Low Rust
Water vapor	1 h	95°C	Low Rust
FOUR BALL TEST	1 h	75°C	0.55–0.75 mm*
ASTM D4172B	1 h	150°C	0.55–0.75 mm*

* depending on the base fluid

Fomblin DA 308

Fluid formulation: Base fluid: Fomblin Y & M
Concentration of additive: 3 & 5% (wt.)

AntiRust and AntiWear Properties

Test	Test Conditions		Test Results
	Time	Temperature	
Fog Chamber D.I. water, rH 98%	140 h	35°C	No Rust
ASTM D665 Synt.sea water	120 h	60°C	No Rust
ASTM D665 mod. Tap water	24 h	90°C	Low Rust
Water vapor	1 h	95°C	Low Rust
FOUR BALL TEST ASTM D4172B	1 h	75°C	0.55–0.80 mm*

* depending on the base fluid

For information contact your Solvay Solexis representative or:

Europe

Solvay Solexis S.p.A. (Italy)

Tel: +39-02-3835-1

Fax: +39-02-3835-2129

Email: solvaysolexis.ita@solvay.com

North America

Solvay Solexis, Inc.

Tel: +1-856-853-8119

Fax: +1-856-853-6405

Email: solvaysolexisinfo@solvay.com

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Solexis, Inc. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes.

Trademarks and/or other Solvay Solexis, Inc. products referenced herein are either trademarks or registered trademarks of Solvay Solexis, Inc. or its affiliates.

Copyright 2002, Solvay Solexis, Inc. All Rights Reserved.

Fomblin PFPE: Additives

Product Data Sheet

Fomblin DA 308

Fluid formulation: Base fluid: Fomblin Y &
Concentration of additive: 3 & 5% (wt.)
Thickener: PTFE

AntiRust and AntiWear Properties

Test	Test Conditions		Test Results
	Time	Temperature	
EMCOR (DIN 51802) Distilled water	164 h	ambient	No Rust
ASTM D1743 Water vapor	1000 h	50°C	No Rust
FOUR BALL TEST	1 h	75°C	1.0 mm
ASTM D2266	1 h	250°C	1.0 mm

Fomblin DA 308

Solvent formulation: Base solvent: Galden SV 90
Concentration of additive: 3 & 87% (wt.)

AntiRust and AntiWear Properties

Fog Chamber D.I. water, rH 98%	Test Conditions		Test Results
	Time	Temperature	
3% DA 308	192 h	35°C	No Rust
8% DA 308	480 h	35°C	No Rust

Applications of Additivated Fluids and Greases

The availability of additivated Fomblin fluids widens the range of applications for perfluorinated fluids and greases in fields demanding high anti-rust properties. These applications include lubrication of bearings, gears, turbine and liquid compressors that may be in contact with condensed water vapor.

These additives also provide an opportunity to use Fomblin as a hydraulic fluid, filling fluid and solvents where antirust prevention is one of the primary

product specifications. Pretreatment with additivated Fomblin Y-VAC fluids protects vacuum pumps during storage and transportation without affecting the performance of Fomblin fluids (i.e. vapor pressure, chemical and thermal stability), thereby avoiding the need to clean the pump to remove the antirust protective agent. Additionally, the additive protects the body of the pump in the presence of highly oxidizing agents.

Additivated Galden solvents can be easily applied to metal parts by spraying or coating. The residual film

For information contact your Solvay Solexis representative or:

Europe
Solvay Solexis S.p.A. (Italy)
Tel: +39-02-3835-1
Fax: +39-02-3835-2129
Email: solvaysolexis.ita@solvay.com

North America
Solvay Solexis, Inc.
Tel: +1-856-853-8119
Fax: +1-856-853-6405
Email: solvaysolexisinfo@solvay.com

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Solexis, Inc. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes.

Trademarks and/or other Solvay Solexis, Inc. products referenced herein are either trademarks or registered trademarks of Solvay Solexis, Inc. or its affiliates.

Copyright 2002, Solvay Solexis, Inc. All Rights Reserved.

Fomblin PFPE: Additives

Product Data Sheet

of the additive guarantees long term corrosion protection and is effective both in Fomblin fluids and in greases. The treatment does not require long cleaning procedures to remove products not compatible with fluorinated materials.

Metal parts can be treated with a thin highly protective anti-rust layer which is completely compatible with Fomblin fluids and greases.

Typical Properties of Fomblin Additivated Fluids

Property	Unit	Fomblin Y 25 NEAT	DA 305 5% WT.	DA 306 5% WT.	DA 308 3% WT.
Kinem. Visc. 20°C	cSt	250	260	264	270
Kinem. Visc. 40°C	cSt	81	83	85	87
Kinem. Visc. 100°C	cSt	10.4	10.5	10.5	10.5
Viscosity Index	—	108	110	106	106
Surface Tension	dyne/cm	22	22	22	22
Density 20°C	g/ml	1.90	1.90	1.90	1.90
Evap. Loss 149°C	% wt.	2.0	2.4	2.5	2.7
Evap. Loss 204°C	% wt.	15	6.0	16.1	—
Vapor Pres. 20°C	Torr	1.4E-6	1.8E-6	2.0E-6	2.4E-6
Vapor Pres. 100°C	torr	2.9E-4	10E-4	2.9E-4	2.9E-4

DA additives – Compatibility with Oxygen

BAM Oxygen Impact Test	Additive			
	None	DA 305 5%	DA 306 5%	DA 308 5%
Max. Oxygen pressure (bar) at 60°C	190	170	180	180

Fluid formulation: Base fluid: Fomblin Y & M
Concentration of additive: DA 306 5% + DA 601 1% (wt.)

Typical Properties of Fomblin Additivated Fluids

FOUR BALL TEST ASTM D4172B	Test Conditions				
	Fluid	Time	Temp.	Load	Test Results
Standard	YR	1 h	75°C	40 Kg	.55 min
Standard	M 15	1 h	75°C	40 Kg	.65 min

For information contact your Solvay Solexis representative or:

Europe
Solvay Solexis S.p.A. (Italy)
Tel: +39-02-3835-1
Fax: +39-02-3835-2129
Email: solvaysolexis.ita@solvay.com

North America
Solvay Solexis, Inc.
Tel: +1-856-853-8119
Fax: +1-856-853-6405
Email: solvaysolexisinfo@solvay.com

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Solexis, Inc. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes.

Trademarks and/or other Solvay Solexis, Inc. products referenced herein are either trademarks or registered trademarks of Solvay Solexis, Inc. or its affiliates.

Copyright 2002, Solvay Solexis, Inc. All Rights Reserved.