H&R ChemPharm (UK) Ltd.
Technical Data Sheet

Optifill H2000 X2

Optifill H2000 X2 is especially designed for use as a water blocking, hydrogen absorbing compound in optical fibre telecommunication cables.

Optifill H2000 X2 is suitable for application by cold drum pump at ambient temperatures.

Optifill H2000 X2 is a soft, thixotropic, hydrophobic gel based on hydrocarbon oils and polymers, and incorporating a hydrogen scavenger system.

Features and Benefits:

- High capacity for absorption of hydrogen
- Resists oil separation at elevated temperatures
- Ideally suited for use in stainless steel tube constructions
- Recommended for use over the service temperature range -45˚C to +120˚C

Physical Properties

Appearance	Visual	Dark Grey Gel
Density at 20˚C/gcm³	ASTM D1475	0.85 Typical
Flash Point of Base Oil (Open)/ ˚C	ASTM D92	165 Minimum
Cone Penetration at 25˚C/0.1 mm	ASTM D217	300 Minimum
Cone Penetration, 24 hours at -45˚C/0.1 mm	ASTM D217	200 Minimum
Viscosity at 20˚C, $50s^{-1}$/mPa.s	DIN 53019 (Haake VT 550)	7000 - 9000
Oil Separation, 24 hours at 120˚C	FTM 791-B (321.2)	Nil
Oil Separation, 2 hours at 200˚C	FTM 791-B (321.2)	Nil
Loss by Evaporation, 24 hours at 80˚C	FTM 791-B (321.2)	1% Typical
Hydrogen Absorption, 24 hours at STP/cm³ g^{-1}	H & R Method†	0.2 Typical
Migration, 24 hours at 70˚C, 3.8mm diameter	Stainless Steel Tube	0%

† Hydrogen Absorption Test Method: Compound is contained in a sealed chamber, initially subjected to hard vacuum, then flooded with hydrogen gas and re-sealed. The absorption is measured as a function of the decrease in pressure measured within the sealed chamber over a period of 24 hours, with temperatures and pressures converted to STP (standard temperature and pressure, i.e. 273˚K and 1 atm.)

The above figures are typical of those obtained with normal production tolerance and do not constitute a specification.

Registered in England & Wales No. 04968242

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OPTIFILL H2000 X2 80

General Description:

OPTIFILL H2000 X2 80 is a soft, thixotropic, hydrophobic gel based on hydrocarbon oils and polymers, and incorporating a hydrogen scavenger system.

Applications:

OPTIFILL H2000 X2 80 is especially designed for use as a water blocking, hydrogen absorbing compound in optical fibre telecommunication cables.

OPTIFILL H2000 X2 80 is suitable for application by cold drum pump at ambient temperatures.

Features:

- High capacity for absorption of hydrogen
- Resists oil separation and dripping at elevated temperatures
- Ideally suited for use in stainless steel tube constructions
- Recommended for use over the service temperature range -55°C to +120°C

Product Data:

Physical Properties		
Appearance	Visual	Dark Grey Gel
Density, 25°C/gcm³	ASTM D1475	0.85 Typical
Flash Point (Open)/°C	ASTM D92	>200
Cone Penetration, 25°C/0.1 mm	ASTM D217	>300
Cone Penetration, -55°C/0.1 mm	ASTM D217	>200
Viscosity at 20°C, $50s^{-1}$/mPa.s	DIN 53019	6000 - 8000
Oil Separation, 24 hours, 80°C	FTM 791-B (321.2)	0% Maximum
Loss by Evaporation, 24 hours, 80°C	FTM 791-B (321.2)	1% Maximum
Hydrogen Absorption, 24 hours, STP/cm³ g^{-1}	H & R Method†	0.2 Typical
Tube Drainage, 24 hrs, 70°C, 3.8mm diam.	Stainless Steel Tube	None

† Hydrogen Absorption Test Method: Compound is contained in a sealed chamber, initially subjected to hard vacuum, then flooded with hydrogen gas and re-sealed. The absorption is measured as a function of the decrease in pressure measured within the sealed chamber over a period of 24 hours, with temperatures and pressures converted to STP (standard temperature and pressure, i.e. 273°K and 1 atm.)

Packaging:

OPTIFILL H2000 X2 80 may be specified in drums (180 kg)

Handling and Storage:

Care should be taken not to overheat product as oxidation may occur, resulting in product degradation.

A MATERIALS SAFETY DATA SHEET FOR THIS PRODUCT IS AVAILABLE ON REQUEST & SHOULD BE CONSULTED FOR ADDITIONAL HANDLING AND STORAGE INFORMATION

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OPTIFILL H210

General Description:

OPTIFILL H210 is a soft, thixotropic, hydrophobic gel based on hydrocarbon oils and polymers incorporating a highly effective hydrogen scavenger system.

Applications:

OPTIFILL H210 is especially designed for use as a water blocking, hydrogen absorbing compound in optical fibre telecommunication cables.

OPTIFILL H210 is suitable for application by cold drum pump at ambient temperatures.

Features:

- Excellent capacity for absorption of hydrogen
- Resists oil separation at elevated temperatures
- Ideally suited for use in stainless steel tube constructions
- Recommended for use over the service temperature range -60°C to +120°C

Product Data:

Physical Properties		
Appearance	Visual	Dark Grey Gel
Density, 25°C/gcm³	ASTM D1475	0.85 Typical
Flash Point (Open)/°C	ASTM D92	>230
Cone Penetration, 25°C/0.1 mm	ASTM D217	>300
Cone Penetration, -60°C/0.1 mm	ASTM D217	>200
Viscosity at 20°C, 50s^{-1}/mPa.s	DIN 53019	12000 – 14000
Oil Separation, 24 hours, 120°C	FTM 791-B (321.2)	0.1% Maximum
Loss by Evaporation, 24 hours, 80°C	FTM 791-B (321.2)	0.1% Maximum
Hydrogen Absorption, 24 hours, STP/cm^3 g^{-1}	H & R Method†	3.0 Typical
Tube Drainage, 24 hrs, 70°C, 3.8mm diameter	Stainless Steel Tube	None

† Hydrogen Absorption Test Method: Compound is contained in a sealed chamber, initially subjected to hard vacuum, then flooded with hydrogen gas and re-sealed. The absorption is measured as a function of the decrease in pressure measured within the sealed chamber over a period of 24 hours, with temperatures and pressures converted to STP (standard temperature and pressure, i.e. 273°K and 1 atm.)

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Technical Data Sheet

Optifill Quartz

Optifill Quartz is especially designed for use as a moisture blocking and buffering compound in optical fibre telecommunication cables. It is suitable for use in loose-tube, slotted core and ribbon cable constructions.

Optifill Quartz is a soft hydrophobic thixotropic gel based on hydrocarbon oils and polymers. It is recommended for use over the service temperature range -40°C- +80°C. Application can be carried out at ambient temperatures using conventional cold pumping techniques.

Features and Benefits:

- Contains no particulates or fillers, so will not block filters in cable filling systems
- Free form drainage and oil separation at elevated temperatures
- Manufactured to precise rheological tolerances
- Remains soft consistency at extremes of sub-zero temperatures

Physical Properties

Appearance	Visual	Colourless Transparent Gel
Density at 20°C/gcm³	ASTM D1475	0.85 Typical
Flash Point of Base Oil (Open)/ °C	ASTM D92	200 Minimum
Cone Penetration at 25°C/0.1 mm	ASTM D217, ASTM D937	300 Minimum
Cone Penetration,at -40°C/0.1 mm	ASTM D217, ASTM D937	200 Minimum
Viscosity at 20°C, 50s^{-1}/mPa.s	DIN 53019 (Hakke VT 550)	8000 - 10000
Oil Separation, 24 hours at 80°C	FTM 791-B (321.2)	Nil
Volatility, 24 hours at 80°C	FTM 791-B (321.2)	0.20% Typical
Critical Yield Stress at 20°C/Pa	Controlled Stress Rheometer†	20 Typical
Migration, 14 days at 70°C	PBT Tube	0%
	MDPE Sheet	6%
	HDPE Sheet	5%

†Critical Yield Stress Method: Optifill Quartz is held between a 4cm diameter 2° cone and plate, and is allowed to equilibrate at the test temperature for 20 minutes. Shear stress is applied at 1Pa, increasing at a rate of 1Pa per minutes until a non-zero value of shear is detected. The shear stress being applied at this point is defined as the critical yield stress.

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Naptel 851 Specification

1.0 General Description

Naptel 851 is a blend of synthetic hydrocarbons and waxes. It is mainly used for the impregnation of paper insulated AC power transmission cables.

2.0 Specification

Naptel 851				
	PROPERTIES	SPECIFICATION	UNITS	METHODS
2.1	Colour	White		Visual
2.2	Kinematic Viscosity at 120°C	75 - 90	cSt	ASTM D445
2.3	Cone Pen at 25°C	45 - 70	mm	IP 179 mod
2.4	Drop Point	90 min	°C	ASTM D566 mod
2.5	Volume Resistivity at 100°C	150 min	T.Ohm.cm	IEC 247
2.6	Dielectric Dissipation Factor at 100°C	0.00050 max		IEC 247
2.7	Relative Permittivity at 100°C	2.3 max		IEC 247
2.8	Flashpoint (COC)	175 min	°C	ASTM D92
2.9	Total Acid Number*	0.05 max	Mg KOH/g	IEC 811-5-1

* Section 2.9 is tested periodically (annually)

3.0 Test Certificates and Packaging