Bituseal® Polypropylene Topcoat
Product Data Sheet

Rev. 9, November 2015

PHOENIX INTERNATIONAL A/S

Product Description
PHOENIX INTERNATIONAL A/S has improved the Bituseal® coating evenfurther with help from a polypropylene (PP) topcoat or shield.

The Bituseal® PP Topcoat can be applied to the Bituseal® coated pipe in order to obtain outstanding mechanical protection properties of onshore pipelines.

The Bituseal® PP Topcoat has a number of advantages:

- It is particularly suitable for rocky areas. The requirements of the "sandbed" during installation has dramatically been reduced.
- The white polypropylene surface gives a unique solar protection.
- Improves the handling properties of the Bituseal® coated pipes.
- Improved ease stockpiling of coated pipes.
- Improves the transportation ability of the coated pipe.
- Dramatically decreases the damages of the coating after handling, stockpiling and transportation.
- Improves pipe lay methods and increases the production of the pipe laying.
- Improves long term mechanical durability of the coating.

Application
Before the Bituseal® PP Topcoat layer is extruded on the coated pipes, the Bituseal® coating is inspected for voids or any kinds of failures.

Pipes with voids are rejected or repaired prior to application of Bituseal® PP Topcoat. This ensures an extreme low rate of failures during the coating process and for that reason it is a superior system compared to traditional plastic coatings. Bituseal® PP Topcoat is spiral applied by flat film dieextrusions.

Track Record
The system has already been sold to several large pipeline projects, among others a pipeline of 250 km x 65", and furthermore a 800 km x 42" pipeline project is coated with the Bituseal® PP Topcoat system.

Delivery
The polypropylene is available in granulated form.

Standards
The Bituseal® System with Bituseal® PP Topcoat meets and exceeds all the performance requirementes of Shell Specification DEP 31-30-40-33. Furthermore the system meets requirements according to DIN 30672 part 1, ASTM G21 and G22.
See table on reverse page.

Quality Control
All raw materials for the Bituseal® System are tested and approved in the laboratories of PHOENIX INTERNATIONAL A/S according to the requried standards.

Head Office: Industrivej Vest 11 • 6600 Vejen • Denmark • Tel: +45 7696 3400 • Fax: +45 7696 3401 • info@phoenixint.dk • www.phoenixint.dk

Bituseal® Polypropylene Topcoat
Product Data Sheet

PHOENIX INTERNATIONAL A/S

Tests of Bituseal® PP Topcoat on Bituseal® coated pipes

Test	Method	Results
Thickness of PP layer	-	>1.00 mm, customised thickness
Shore D hardness	ISO 868	62
Fungia resistance	ASTM G21	No growth
Bacteria resistance	ASTM G22	No growth
Root penetration	-	No penetation
Impact resistance	DIN 30670	No penetration
Indentation @ 23°C, 1mm PP coating thickness	DIN 30672 part 1	No penetration at stress 10 N/mm (class C) remaining thickness of 4 mm coating = 3.5 mm
Indentation @ 50°C, 1mm PP coating thickness	DIN 30672 part 1	No penetration at stress 10 N/mm (class C) remaining thickness of 4 mm coating = 2 mm

Tests of Bituseal® Enamel used as corrosion protection for Bituseal® PP Topcoat

Test	Method	Units	Results
Softening point	EN 1427	°C	125-150
Penetration	EN 1426	Dmm at 25°C	5-13
Filler content	BS 4147, 1980	% w/w	25-35
Density	BS 4147, 1980	g/cm³ at 25°C	1.2-1.4
Flash point	BS 4689	°C	min. 260
Bend	BS 4147, 1980	min. mm at -10°C	20
Bend	BS 4147, 1980	min. mm at -20°C	20
Sag	BS 4147, 1980	max. mm at 100°C	1.5
Impact	BS 4147, 1980	max. mm² at -10°C	6,500
Peel, initial and delayed	Shell DEP 31.40.39.33	min. N/mm 30° min. N/mm 40° min. N/mm 50° min. N/mm 60°	4.0 2.5 1.5 1.0
Cathodic disbonding	BS 3900, F 11	max. mm	5.0

Product Code	100-480

Head Office: Industrivej Vest 11 • 6600 Vejen • Denmark • Tel: +45 7696 3400 • Fax: +45 7696 3401 • info@phoenixint.dk • www.phoenixint.dk