



# COGEGUM<sup>®</sup> GFR/360

**Silane crosslinkable halogen-free fire retardant, oil and fuel resistant compound for sheathing and insulation of power, signal and control cables**

**description** HFFR silane grafted compound for cable sheathing and insulation, moisture curable by addition of a catalyst masterbatch (Sioplas method). It consists of a polyolefin base containing a fire retardant system that contributes to give the cable self-extinguish properties without halogenidric acids evolution, toxic and corrosive gases and dark smoke emission.

**standard complying** Cenelec HD 22.1 EI5, IEC 60092-359 SHF2, Cenelec EN 50264 EI101...EI109 and EM101...EM104, VDE 0207-24 HM3, CEI 20.11 M2, M4

| physical properties  |  | typical value | test method |
|--|--|---------------|-------------|
| density @23°C (g/cm <sup>3</sup> ):  |  | 1.43          | ASTM D 792  |
| shore D hardness:  |  | 49            | ISO R 868   |
| M.F.I. @190°C/21.6 kg (g/10')  |  | 7.2           | Padanaplast |
| unaged mechanical properties<br>- tensile strength (N/mm <sup>2</sup> ):<br>- elongation at break (%):   |  | 12.5<br>190   | IEC 60811   |
| mechanical properties after ageing in air oven, 168 hours @135°C<br>- variation on tensile strength (%):<br>- variation on elongation at break (%):          |  | +12<br>+10    |             |
| mechanical properties after ageing in air bomb, 40 hours @127°C, 0.55 MPa<br>- variation on tensile strength (%):<br>- variation on elongation at break (%): |  | +20<br>-15    |             |
| IRM 902 oil immersion test, 168 hours @100°C<br>- variation on tensile strength (%):<br>- variation on elongation at break (%):                              |  | -22<br>+6     |             |
| IRM 903 fuel immersion test, 168 hours @70°C<br>- variation on tensile strength (%):<br>- variation on elongation at break (%):                              |  | -12<br>+11    |             |
| 1N oxalic acid solution immersion test, 168 hours @23°C<br>- variation on tensile strength (%):<br>- variation on elongation at break (%):                   |  | -18<br>-24    |             |
| 1N sodium hydroxide solution immersion test, 168 hours @23°C<br>- variation on tensile strength (%):<br>- variation on elongation at break (%):              |  | +3<br>-11     |             |
| hot set test @250°C, 20 N/cm <sup>2</sup><br>- elongation under load (%):<br>- permanent elongation after cooling (%):                                       |  | 70<br>0       |             |
| hot pressure test @150°C, k=1, max. deformation (%):   |  | < 50          |             |
| bending test @-40°C:   |  | no cracks     |             |
| water absorption, 168 hours @70°C (mg/cm <sup>2</sup> ):   |  | 2.0           |             |

| electrical properties          |        | typical value          | test method |
|--------------------------------|--------|------------------------|-------------|
| volume resistivity (Ω x cm):   | @20°C: | 4.0 x 10 <sup>14</sup> | IEC 60502   |
|                                | @90°C: | 5.3 x 10 <sup>13</sup> |             |
| insulation constant (MΩ x km): | @20°C: | 1500                   |             |
|                                | @90°C: | 200                    |             |

| burning properties                  |                       | typical value | test method |
|-------------------------------------|-----------------------|---------------|-------------|
| oxygen index (% O <sub>2</sub> ):   |                       | 35            | ASTM D 2863 |
| temperature index (°C):             |                       | 290           | NES 715     |
| halogenidric acid emission (% HCl): |                       | < 0.1         | IEC 60754-1 |
| corrosivity of gases evolved        | pH:                   | > 4.3         | IEC 60754-2 |
|                                     | conductivity (µS/mm): | < 10          |             |

tests made on pressed or extruded specimens, added with 5% of Catalyst CT/2-HP and crosslinked in hot water

**processing** COGEGUM® GFR/360 pregrafted base must be added with Catalyst CT/2-HP masterbatch to promote curing. Catalyst dosage is 5% by weight and blending must be done just before using (2-3 hours max.), preferably in the extruder hopper. Catalyst doesn't need any predrying.

The pregrafted base compound is sensible to moisture; open bags must be used within few hours.

**extrusion equipment** Standard extruders for thermoplastics equipped with low compression screw (1:1.2-1.4 compression ratio and 20-25 L/D ratio are suggested), and an adequate barrel thermoregulation  
Screw cooling not required.  
Filter net: 40-80 mesh/cm<sup>2</sup> max.  
Compression tools suggested.

**temperature setting**

|          | zone 1 | zone 2 | zone 3 | zone 4 | collar | head | die |
|----------|--------|--------|--------|--------|--------|------|-----|
| max (°C) | 150    | 160    | 170    | 170    | 170    | 170  | 200 |
| min (°C) | 130    | 140    | 140    | 140    | 150    | 150  | 160 |

**curing** - by immersion in hot water at 60-70°C  
- by exposure to low pressure steam (about 0.15 bar)  
- by exposure in ambient at 10-30°C for some days

In all cases curing time depends on insulation thickness; for 0.7-1.2 mm wall thickness 3-6 hours are generally necessary in case of forced curing in hot water and 12-16 hours in case of curing in steam room; in case of self curing, time depends also on the specific ambient conditions.

**colouring** EVA based masterbatches added at 1.2-1.5% (approx.) by weight; predrying of colour masterbatch is suggested if moisture absorption occurred during storage (4-6 hours at 60-70°C).

**storage** The product should be stored under the following conditions:  
- closed and unbroken bags  
- ambient temperature not exceeding 30°C  
- avoid direct exposure to sunlight and weathering

Product alterations could occur due to extended period of storage. Its use within six months from the production date is suggested.  
Solvay Padanaplast S.p.A. accepts no liability of any kind in case the above mentioned conditions are not fulfilled.

**packaging** 25 kg moisture-resistant bags on 1250 kg pallet.

**contact** Solvay Padanaplast S.p.A. - Via Paganina 3 - 43010 Roccabianca (Parma) - ITALY  
phone: +39 0521 5291  
fax: +39 0521 870427  
e-mail: info.padanaplast@solvay.com  
http: www.padanaplast.com

**disclaimer** The data and numerical results contained in this document are provided for the sake of general information and are given in good faith. They reflect the state of our knowledge at the time of publication. Because the possibilities and application conditions of our product are many and varied, and lie beyond our control, we can in no event be held responsible if all the necessary information on planned applications have not been formally brought to our attention. The information presented here cannot be considered as a suggestion to use our products without taking into account existing patents, or legal provisions or regulations, whether national or local. The purchaser is obliged to verify whether the possession, use or marketing of our products is subject within his territory to particular rules, especially with respect to public health, hygiene and worker and/or consumer safety. The purchaser alone assumes the duties of information and advice for the ultimate user. Specifications reported on this datasheet can not be used as reference values in a technical or sales contract. Padanaplast can in no event be held responsible for a possible failure on the part of the purchaser to respect these regulations, provisions and duties.  
This document replaces all previously published on this product.

Solvay  
Padanaplast



a Passion for Progress®