STARFLAM®
FLAME RETARDANT POLYAMIDE
(NYLON - 6, -66, PPA)
FORMULATED POLYMERS LIMITED, the professionally managed company established in 1993 with an objective to design and manufacture a comprehensive range of Thermoplastic Compounds, specialising in Engineering Plasctics under the brand name FORMPOLY.

Over the years, FPL has established 400 grades in 10 engineering polymers mostly specialising in niche compounds. FPL has approvals from various OEMs serving large sectors of industries with product reach internationally.

FPL is powered by cutting-edge expertise pving its way to cost effective manufacturing and has grown into a mammoth figure in the industry with a wide-spread reach.

FPL facilities are certified to ISO 9001; ISO/TS 16949 and ISO 14001 quality systems. FPL combining a strong technology base with application expertise, design and manufacture Engineering Plastic from relatively inexpensive compounds to sophisticated high end engineering plastic compounds. Visit www.formulatedpolymers.com for more details.

EUROSTAR ENGINEERING PLASTICS, history is linked to four decades of innovation in the field of engineering plastics compounds. Since 1972 the company based in Fosses (France) has been Manufacturing Plastics Compounds based on most of the Thermoplastics Resins available on the market.

The company recognition comes also from its unique know-how in the development and commercialization of halogen free flame retardant compounds. The use of these type of compounds in electrical circuit protection device is a well established fact for all the key players in this field.

Eurostar-EP Compounds are also key solutions in E&E, Transportation, Photovoltaics, Appliance Market Segments. OEM involved are mainly global players, for them compliance with international standard is a must. Above the conformity to EU RoHS directive technical standards that might apply are IEC 60695, UL 94, UL 508, NF16-101 and 16-102 for instance. Visit www.eurostar-ep.com for more details

40 Years History of Eurostar

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>Creation of Eurostar</td>
</tr>
<tr>
<td>1983</td>
<td>Buy out of Eurostar by Ferro; the company becomes Ferro-Eurostar</td>
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<tr>
<td>1995</td>
<td>Buy out of Ferro-Eurostar by LNP; the company becomes LNP-Eurostar</td>
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<tr>
<td>2002</td>
<td>Buy out of LNP by GE Plastics</td>
</tr>
<tr>
<td>2007</td>
<td>Buy out of GE Plastics by SABIC</td>
</tr>
<tr>
<td>2010</td>
<td>MBO, company becomes Eurostar Engineering Plastics</td>
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</table>

Technical Collaboration

Formulated Polymers Limited (FPL) India and Eurostar Engineering Plastics (EEP) France have signed a technical collaboration agreement for design and manufacturer of STARFLAM® Flame Retardant Polyamide compounds for Electrical and Electronic market. The whole product range would be available through FPL.
STARFLAM® Product Range

STARFLAM® Flame Retardant Polyamides (Nylon 6, Nylon 66, PPA etc.) are offered in a wide range of selection from Unfilled to Mineral Reinforced to Glass Fiber Reinforced with UL 94 V0, V1, V2, 5V selection from thickness 0.4 mm. The range includes Halogen based, Phosphorus based, non-halogen & non-phosphorus based including next generation products. Below table gives the summary.

**STARFLAM® Highlights**
Flame Retardant Polyamide
(from unfilled to glass/mineral reinforced)

**UL 120+ Yellow Cards / Recognized by UL**

STARFLAM® compounds are designed to meet the most stringent environmental requirements, combined with highest Flame, Electrical and Mechanical performances.

**Major Reinforcements:**
Glass fibers, Glass beads, Minerals

**Property Highlights:**
- Robust Flammability: UL 94 V2 to V0 @ 0.4 mm thickness
- High CTI: > 450 V > 600 V
- GWT: 960 C @ 0.8 mm
- HDT: up to 250 C
- Coloreable
- Laser markable

**BRINGING BRAND PROTECTION TO YOUR PRODUCTS**
- **STARFLAM® Security Solution**

Adding specific and invisible Marker in any of STARFLAM® makes your product immediately recognizable. By adding markers that are imperceptible to the naked eye but observable to Acoustic Detector, makes your original product audible. When examining a product if it contains the specific marker the detector react with an acoustical signal.

**STARFLAM® Security Solution**

No impact on product properties (mechanical, flame retardant, etc.) when the invisible marker is added. Imperceptible to naked eye

when examining a product that contains the specific market, the detector react with an acoustical signal

**STARFLAM® Grades**

STARFLAM® range is offered in Nylon -6, Nylon -66 and in PPA. Some of the grades are listed here. The complete range can be selected and its data sheets can be downloaded from website http://www.eurostar-ep.com/en-us/products/index.aspx.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>A28UL</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free, Flame Retardant, Polyamide 66 Injection Moulding Resin</td>
</tr>
<tr>
<td>AFR200Y</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free, Flame Retardant, Polyamide 66 Injection Moulding Resin</td>
</tr>
<tr>
<td>AFR450B</td>
<td>Flame Retardant, 25% Glass Fiber Reinforced Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>AFR450X1</td>
<td>Red Phosphorous Flame Retardant, Glass Fiber Reinforced Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>AFR460B</td>
<td>Flame Retardant Glass Fiber Reinforced Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>AFR470X2</td>
<td>Red Phosphorous Flame Retardant, Glass Fiber Reinforced Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>AFR560B1</td>
<td>Flame Retardant, Mineral Filled and Glass Fiber Reinforced, Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>AFR662B1</td>
<td>Flame Retardant, Mineral Filled Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>B28UL</td>
<td>Unfilled Halogen Free and Red Phosphorous Free Flame Retardant Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>BFR200Y</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free Flame Retardant Polyamide 6 Injection Moulding Resin</td>
</tr>
<tr>
<td>BFR330A</td>
<td>Flame Retardant Glass Bead Reinforced Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>BFR430A</td>
<td>Flame Retardant, Glass Fiber Reinforced Polyamide 6 Injection Moulding Resin</td>
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<td>BFR552Y6</td>
<td>Halogen and Red Phosphorous Free Flame Retardant, Glass Fiber Reinforced, Mineral Filled Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>P10002E</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free, Flame Retardant Polyamide 6 IM Resin (also known as P1000Z220)</td>
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<tr>
<td>PF0023E</td>
<td>Mineral Flame Retardant, Halogen Free Red, Phosphorous Free, Glass Fiber Reinforced, Polyamide 6 Injection Moulding Resin</td>
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<td>PF0047E</td>
<td>Halogen Free and Red Phosphorous Free, Flame Retardant, Glass Fiber Reinforced, Polyamide 6 Injection Moulding Resin</td>
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<td>PF0057E</td>
<td>Halogen Free and Red Phosphorous Free, Flame Retardant, Mineral Filled, Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>PB1399E</td>
<td>Flame Retardant Glass Bead and Glass Fiber Reinforced Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>PK002E</td>
<td>Halogen Free Red Phosphorous Free Flame Retardant, Mineral Filled, Polyamide 6 Injection Moulding Resin</td>
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<td>PK005E</td>
<td>Halogen Free Red Phosphorous Free Flame Retardant, Mineral Filled, Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>PX0020</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free, Flame Retardant, Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>PX0070</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free, Flame Retardant, Polyamide 6 IM Resin (for laser marking grade)</td>
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<tr>
<td>PZ0042E</td>
<td>Halogen Free and Red Phosphorous Free, Flame Retardant, Glass Reinforced Polyamide 6 Injection Moulding Resin</td>
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<td>PZ0052E</td>
<td>Halogen Free and Red Phosphorous Free, Flame Retardant, Glass Reinforced Polyamide 6 Injection Moulding Resin</td>
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<td>PZ0062E</td>
<td>Halogen Free and Red Phosphorous Free, Flame Retardant, Glass Reinforced Polyamide 6 Injection Moulding Resin</td>
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<tr>
<td>R10002E</td>
<td>Unfilled, Halogen Free and Red Phosphorous Free, Flame Retardant, PA66 / PA 6 IM Resin (also known as R1000Z220EM)</td>
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<tr>
<td>RF002E</td>
<td>Mineral Flame Retardant, Halogen Free Red and Phosphorous Free, Glass Fiber Reinforced, PA66 and PA6 IM Resin</td>
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<tr>
<td>RF0052E</td>
<td>Halogen Free and Red Phosphorous Free Flame Retardant, Glass Reinforced, Polyamide 66 / Polyamide 6 IM Resin</td>
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<tr>
<td>RF0057E</td>
<td>Halogen Free and Red Phosphorous Free Flame Retardant, Glass Reinforced, PA66 IM Resin (also known as RF1005Z220)</td>
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<td>RF0069</td>
<td>Flame Retardant, Glass Fiber Reinforced, Polyamide 66 Injection Moulding Resin</td>
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<tr>
<td>RF0077E</td>
<td>Halogen Free and Red Phosphorous Free Flame Retardant, Glass Reinforced, PA 66 IM Resin (also known as RF1007Z220)</td>
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<tr>
<td>UF0033</td>
<td>Mineral Flame Retardant, Halogen Free and Red Phosphorous Free, Glass Reinforced, Polyphthalamide Injection Moulding Resin</td>
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</tbody>
</table>

**PACKING**

All STARFLAM® products are in pellet form and offered in standard 25 Kg and 500 Kg moisture proof bags. MOQ for Produced for stock grades are based on packing size mentioned here, and for produced against order depends on the colour, polymer and the same provided by your nearest supply chain executive.

**PROCESSING**

STARFLAM® grades are designed and manufactured carefully to achieve easy flow, permit thin section moulding, fast solidification and best release property in case of injection moulding and uniform flow with excellent dimension stability in case of extrusion. STARFLAM® grades are process stabilised for easy processing under wide temperature range.

More details of processing can be seen in compact disc provided for each grade or can be downloaded from website. Ask for assistance to nearest technical services staff to establish the processing and in case of difficulties.
**Connector**
P10002E
UL-94 V0
RTI 120°C

**Miniaturization**
RF0057E
R10002E
UL-94 V0 @ 0.4 mm
GWFI 960°C @ 0.4 mm
CTI 600 V

**Transportation & Seats**
P0047E
Low Smoke & Toxicity
DIN 5510
NF F 16 101102
Aesthetics

**Photovoltaics**
RF0057E
UL94 5VA
UL F1 rating
RTI 140°C
CTI 600 V

**Circuit Protection**
PK0052E
PZ0042E
PZ0052E
GWFI 960°C
CTI > 450 V

**Appliances**
RF0055E
UL94 V0
VDE GWIT 775°C

**Structural**
RF0097E
RF0077E
UL94 V0
Modulus > 13000 MPa
RTI mech = 150°C

**Contactor**
AFR450X2
UL94 V0
RTI 120°C
CTI 600 V
FORMPOLY® Product Range

POLYMERS

- Polyamide – 6 (Nylon 6)
- Polyamide – 66 (Nylon 66)
- Polyamide – 46 (Nylon 46)
- Polyamide – 12 (Nylon 12)
- Mod. Poly Phenylene Ether (m-PPO)
- Poly Phenylene Sulphide (PPS)
- Polypropylene – Homo & Co (PP)
- Acrylonitrile Butadiene Styrene (ABS)
- Styrene Acrylonitrile (SAN)
- Polycetal – Homo & Co Polymer (POM)

RANGE OFFERED

- Glass Fibre Reinforced
- Mineral Reinforced
- Flame Retardant (Halogen and Halogen Free)
- Impact Modified
- Electrically Conductive
- UV Stabilised
- Heat Stabilised
- Antistatic
- Lubricated
- Pre Coloured
- RoHS compliance
- Alloys and Blends

Recent Awards and Recognitions

- National Award of Innovation 2010 - Technology Management from Govt. of India
- TQM - SE Excellence Award 2011 from CII
- 10th MMA Award for Managerial Excellence 2011
- National Award of Innovation 2010 - Plastic Raw Material from Govt. of India
- National Award 2009 for Outstanding Entrepreneurship from Govt. of India
- Plasticon Award 2009 of Excellence - “Best Growing Engineering Plastic Manufacturer in India”
- ISO 9001 Quality Award from EEMA

FORMULATED POLYMERS LIMITED
Manufacturers of Engineering Plastic Compounds

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