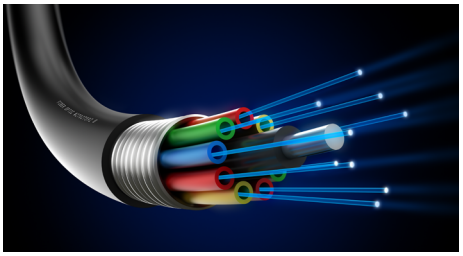
SOLUTION SHOWCASE

Celanese

# OPTICAL FIBER CABLE SOLUTIONS FROM CELANESE

Digital transformation is bringing immediate and significant challenges to the communications industry. 5G adoption, growth of hyperscale data centers, and expansion of the Internet of Things all require the communication infrastructure to handle increasing quantities of data effectively on a global scale. Fiber optics offer significantly greater bandwidth potential and are increasingly favored over traditional co-axial cables.



## INDUSTRY NEEDS

These trends are driving the need for stricter requirements on polymers used for optical fiber constructions, such as those for tight buffers, loose tubes, and jacketing. Preferred performance benefits include:

- Very good physical properties to protect the fibers from external environment
- Flexibility to allow faster and easier installation
- Allowing thin wall designs — more fibers must be bundled in reduced cable diameters
- Safety and reliability to help new cable designs comply with local or global regulations
- Good extrusion processability to control costs

## SOLUTIONS

Celanese Hytrel® TPC-ET thermoplastic elastomers and Celanese Crastin® PBT resins enable our customers to design next generation cables that meet the highest performance standards. We combine global scientific leadership in specialty elastomers, engineering resins, and additives with unmatched collaborative and testing capabilities to help our customers engineer, process, and deliver high-performing cable insulation and jacket materials.

## ABOUT HYTREL® TPC-ET

For the design and manufacture of optical fiber cables, Hytrel® TPC-ET thermoplastic elastomers provide the flexibility of rubbers, the strength of plastics, and the processability of thermoplastics. These products are durable, enable fast and easy assembly, and offer improved processing and coloring. Specific benefits include:

- Strength and flexibility without plasticizers
- Flexibility at low temperatures
- Abrasion resistance
- Excellent heat and chemical resistance
- Outstanding flex fatigue and resistance to tearing/flex cut growth
- Protect fiber from mechanical damage and external environment
- Specific grades for easy peel, allowing time savings for installation without stripping tools
- Good tear resistance
- Easy processing, very low wall thickness is possible
- Smooth surface aspect
- Low post shrinkage and coefficient of linear thermal expansion

## ABOUT CRASTIN® PBT

Crastin® PBT is the resin of choice for cost-effective high-performance optical fiber cables across a wide range of electrical and electronic applications. Specific benefits for optical fiber cables include strong mechanical properties, contributions to a stable manufacturing process, and low signal attenuation attained by:

- Enabling thin wall constructions and good kink resistance
- High flexural modulus and elongation at break
- Excellent low-temperature impact resistance
- Consistent hydrolysis performance and stress crack resistance
- Maintaining tubes OD/ID (dimensions)
- Fast line speed and start-up
- Isotropic shrinkage
- Low post shrinkage and coefficient of linear thermal expansion

## SOLUTIONS FOR LOOSE TUBES

| Recommended grade | Density g/cm3 | Melt-mass flow rate @ 250° C (g/10 min, 2.16kg) | Flex modulus (MPa) | Strain at break (%) |
|---|---|---|---|---|
| Crastin® PBT 6129 | 1.32 | 10 | 2400 | >200 |
| Crastin® PBT 6130 | 1.30 | 16 | 2400 | >200 |
| Crastin® PBT S600F10 | 1.30 | 11 | 2400 | >200 |
| Crastin® PBT ST830FRUV* | 1.37 | 3 (3Kg) | 2100 | >50 |

*Super tough UV stabilized FR grade (UL94V-0 @0.85mm)

## SOLUTIONS FOR TIGHT BUFFERS

| Recommended grade | Density g/cm3 | MFR (g/10min, 2K16) | Flex modulus (MPa) | Hardness max shore D | Stress at break (MPa) | Strain at break (%) |
|---|---|---|---|---|---|---|
| Hytrel® 5556 | 1.19 | 7.8 @ 220°C | 190 | 55 | 40 | >300 |
| Hytrel® 5555HS | 1.19 | 8.5 @ 220°C | 195 | 55 | 35 | >300 |
| Hytrel® 6356 | 1.22 | 9 @ 230°C | 290 | 63 | 43 | >300 |
| Hytrel® 7246 | 1.26 | 13 @ 240°C | 550 | 68 | 50 | >300 |
| Hytrel® 8238 | 1.28 | 12.5 @ 240°C | 1150 | 76 | 46 | >300 |
| Hytrel® HTR6108* | 1.25 | 5.1 @ 190° | 170 | 61 | 32 | 290 |

*For translucent applications

## SOLUTIONS FOR MINI LOOSE TUBES

| Recommended grade | Density g/cm3 | MFR (g/10min, 2k16) | Flex modulus (MPa) | Hardness max shore D | Stress at break (MPa) | Strain at break (%) |
|---|---|---|---|---|---|---|
| Hytrel® HTR8351* | 1.15 | 10 @ 190°C | 21 | 24 | 9 | 210 |
| Hytrel® G3548 | 1.15 | 10 @ 190°C | 25 | 35 | 10 | 190 |

*Easy strippability for installation without tools

## SOLUTIONS FOR CABLE OUTER JACKET

| Recommended grade | Density g/cm3 | Flex modulus (MPa) | Hardness max shore D | Stress at break (MPa) | Strain at break (%)[1] |
|---|---|---|---|---|---|
| Hytrel® HTR8813* | 1.23 | 370 | 58 | 11 | 150 |
| Zytel® LC6200** | 1 | 1000 | 69 | 35 | >150 |

[1] 50 mm.min-1

* NHFR grade, V-0 @1.5mm, LOI 49%

** PA612-HI and for additional information on Zytel®, please visit celanese.com



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