SOLUTION SHOWCASE

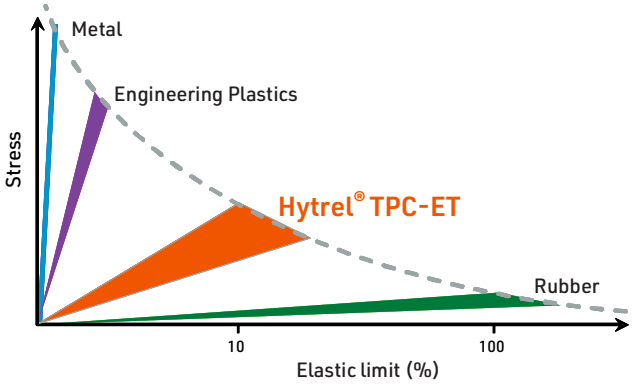
Celanese

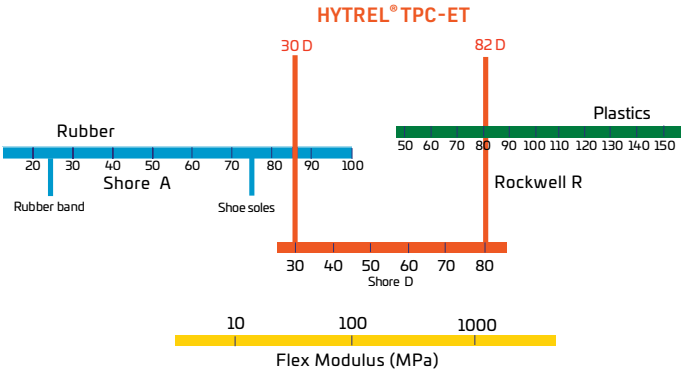
CELANESE PRODUCT PORTFOLIO FOR WIRE AND CABLE APPLICATIONS – HYTREL® TPC-ET

CELANESE HYTREL® TPC-ET THERMOPLASTIC ELASTOMERS

Hytrel® TPC-ET thermoplastic polyester elastomers provide the flexibility of rubbers, the strength of plastics, and the processability of thermoplastics. Hytrel® TPC-ET is also available in a full range of Shore D hardnesses (30D to 82D).

Hytrel® TPC-ET possesses super hardness and stiffness which gives broad scope and great flexibility for wire and cable applications.





OUR POLYMER/MASTER BATCH/COMPOUNDS OFFERINGS – HYTREL® TPC-ET

Wire and Cable

Polymer | Master Batch | Compounds

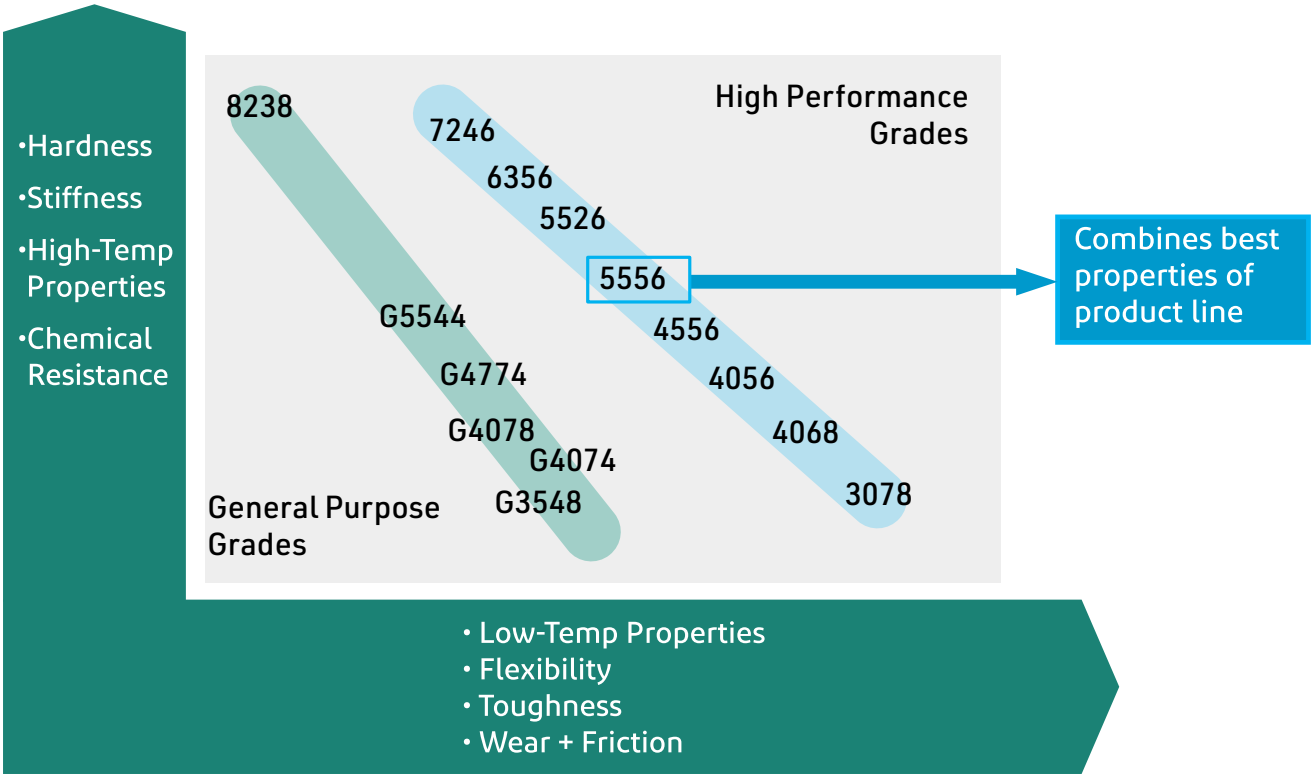
	Melting point °C	Flex Modulus Mpa
Hytrel® TPC-ET 3078	170	27
Hytrel® TPC-ET 4056	152	60
Hytrel® TPC-ET 4556	193	87
Hytrel® TPC-ET 5556	201	190
Hytrel® TPC-ET 6356	210	290
Hytrel® TPC-ET 7246	218	550
Hytrel® TPC-ET 8238	221	1150
Hytrel® TPC-ET G3548	157	25
Hytrel® TPC-ET G4074	170	65
Hytrel® TPC-ET G4774	208	
Hytrel® TPC-ET G5544	214	190

	Melting point °C
Hytrel® TPC-ET 21UV	147
Hytrel® TPC-ET 30HS	155
Hytrel® TPC-ET 40CB	154
Hytrel® TPC-ET 52FR	200
Hytrel® TPC-ET 60LW	210

Compounds	Special Features	Melting point °C	Flex Modulus Mpa	Hardness Max Shore D	Stress at Break Mpa	Strain at Break %	UL94, 1.5 mm	LOI (%)
Hytrel® TPC-ET HTR8351 NC021	Easy Strip	160	21	24	9	210		
Hytrel® TPC-ET HTR6108	Translucent	165	170	61	32	290		
Hytrel® TPC-ET 5555HS	Heat stabilized	201	195	55	35	>300	HB	20
Hytrel® TPC-ET HTR8068	UL94 V0	170	155	44	13	>300	V-0	26
Hytrel® TPC-ET HTR8813 BK320	UL94 V0	200	370	58	11	150	V-0	49

Flame retardent
Low smoke
Halogen free
Low temperature flexibility
Good Thermal resistance
Good oil resistance

HYTREL® TPC-ET PRODUCT LINE



HYTREL® TPC-ET CONCENTRATES

Special grades of Hytrel® TPC-ET thermoplastic polyester elastomer include heat stabilized, flame retardant solutions. Concentrates include black pigments, UV protection additives, heat stabilizers and flame retardants.

Grade	Description	Characteristics and Typical Uses
Hytrel® TPC-ET 21UV	UV light stabilizer concentrate	Used for protection of light-colored parts and/or black thin parts against UV degradation. Recommended letdown ratio is 25:1 or less
Hytrel® TPC-ET 30HS	Heat stabilizer concentrate	For blending with other grades of Hytrel® TPC-ET to retard thermal oxidative degradation and extend useful life at elevated temperatures. Recommended letdown ratio is between 16:1 and 40:1, usually about 20:1.
Hytrel® TPC-ET 40CB	Concentrate of a fine particle size carbon black	Hytrel® TPC-ET must be protected against degradation from exposure to UV light when used outdoors or when exposed to sunlight. Hytrel® TPC-ET 40CB provides the most effective protection. Recommended letdown ratio for direct outdoor exposure is 14:1.
Hytrel® TPC-ET 52FR	Flame retardant concentrate	52FR is a concentrate containing brominated flame retardant and antimony oxide synergist dispersed in Hytrel® TPC-ET 5556.
Hytrel® TPC-ET 60LW	Lubricant concentrate	60LW is a concentrate intended to improve wear and friction properties of Hytrel® TPC-ET grades. The carrier is a 63D hardness Hytrel® TPC-ET grade and processing should always be carried out at melt temperatures that ensure it is fully melted, preferably 240°C (465°F) or above.

* All concentrates are supplied in pellet form. They can be dry-blended with pellets of unmodified grades, then melt-mixed in the screw of an extruder or injection molding machine.

HYTREL® TPC-ET FOR PVC MODIFICATION

PVC can be modified and compounded in many different ways to gain specific properties for targeted end uses. Hytrel® TPC-ET can be added to improve mechanical performance, having the major advantage of also softening the final product without the issues of migratory plasticisers. Hytrel® TPC-ET is a high molecular weight copolyester elastomer and, itself a polymer, can be easily blended with PVC.

Hytrel® TPC-ET as a polymer does not contain any phthalate plasticiser.

Potential advantages of Hytrel® TPC-ET in a PVC compound:

- Higher softness without any migration issue
- Improved low temperature flexibility
- Better impact strength at low temperature
- Better stability of mechanical performance over a wider range of temperatures
- Increased flex-life
- Improved chemical resistance, specifically oil resistance

Consistent performance over time, especially vs conventional plasticisers.

HYTREL® TPC-ET FOR OPTICAL FIBERS

Key requirements for optical fibers:

- Maintain good signal transmission
  - Low shrinkage
  - Protect fiber of mechanical damage
  - Protection from external environment
  - Long life
- Easy handling
  - Flexibility (end user, installation)
  - Strip-ability (installation)
  - Friction against duct (installation)
- Easy Processing & Colorability

Hytrel® TPC-ET 5556, 6356, 7246 or **8238** all are good choices for optical fibers applications, providing the flexibility, strength, good tear resistance and low CLTE needed for these applications. If you are looking for an alternative to PA12, we suggest Celanese **Hytrel® TPC-ET 8238**, and if you are looking for easy strip-ability elastomers, then why not consider Celanese **Hytrel® TPC-ET HTR8351?**

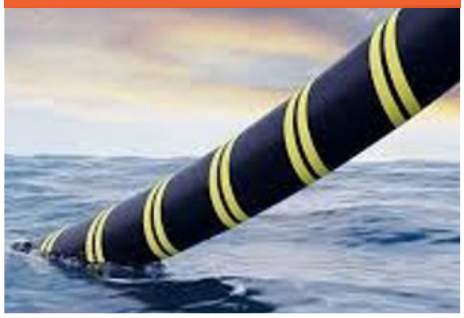
OPTICAL FIBERS SOLUTIONS

		Type	Density gr/cm³	MFR gr/10min, 2.16kg	Melting point °C	Flex Modulus Mpa	Hardness Max Shore D	Stress at Break Mpa	Strain at Break %	UL94 1.5mm	LOI
Loose Tube	Crastin® 6129	PBT	1.32	10 @ 250C	225	2400	–	–	200	HB	22
	Crastin® 6130	PBT	1.30	16 @ 250C	225	2400	–	–	110	HB	22
	Crastin® S600F10	PBT	1.30	11 @ 250C	224	2400	–	–	>50	HB	22
Semi & Tight Buffer	Hytrel® TPC-ET 5556	TPC-ET	1.19	7.8 @ 220C	201	190	55	40	>300	HB	20
	Hytrel® TPC-ET 5555HS	TPC-ET	1.19	8.5 @ 220C	201	195	55	35	>300	HB	20
	Hytrel® TPC-ET 6356	TPC-ET	1.22	9 @ 230C	210	290	63	43	>300	HB	21
	Hytrel® TPC-ET 7246	TPC-ET	1.26	13 @ 240C	218	550	68	50	>300	HB	23
	Hytrel® TPC-ET 8238	TPC-ET	1.28	12.5 @ 240C	221	1150	76	46	>300	HB	22
	Hytrel® TPC-ET HTR6108 (translucent)	TPC-ET	1.25	5.1 @ 190C	165	170	61	32	290	–	–
Mini Loose Tubes	Hytrel® TPC-ET HTR8351 NC021	TPC-ET	1.15	10 @ 190C	160	21	24	9	210	–	–
	Hytrel® TPC-ET G3548	TPC-ET	1.15	10 @ 190C	157	25	35	10	190	HB	–
Cable Outer Jacket	Hytrel® TPC-ET HTR8813 BK320	TPC-ET	1.23	12 @ 220C	200	370	58	11	150	V-0	49
	Zytel® LC6200	PA612-HI	1.00	7.8 @ 220C	218	1000	-	-	100	HB	–

Data (DAM) at 23ºC

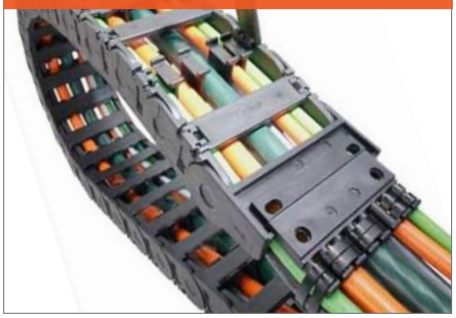
APPLICATION CASES

Hytrel® TPC-ET for better fatigue performance



Dynamic cables for offshore wind and marine energy systems

Hytrel® TPC-ET for outstanding flex fatigue performance



Drag Chain Cables (Robotics)

- Also known as cable carriers, energy chains or cable chains
- Designed to surround & guide flexible cables connected to moving automated machinery
- Used in machine tools, cranes, car washes, medical and laboratory equipment, automomatic warehousing, forklifts, robots, offshore oil rigs

Hytrel® TPC-ET for better 'snapback' performance

Retractable cable for trucks – Jacketing

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Form No. 001-20499-AVI1020 CDP