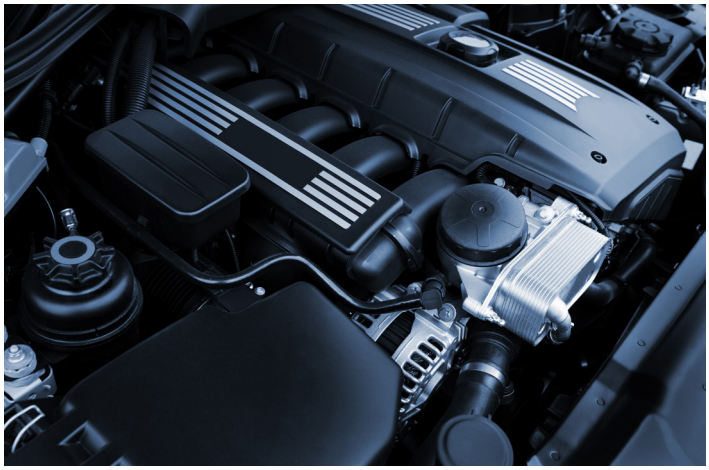
SOLUTION SHOWCASE

Celanese

CELANESE HYTREL® TPC-ET HTR8888 BK190A SIGNIFICANTLY REDUCES NVH IN AUTO AIR MANAGEMENT APPLICATIONS



Air ducts made with Hytrel® TPC-ET HTR8888 BK190A offer quiet air management performance.

Quieter EVs and HEVs present acoustic challenges for vehicle designers. Noises that used to be masked by internal combustion engines (ICEs) must now be dampened or eliminated to create a better driving experience. Manufacturers who use Celanese Hytrel® TPC-ET HTR8888 BK190A for vehicle air management can differentiate their vehicles with significantly less NVH (Noise Vibration Harshness).

Hytrel® TPC-ET thermoplastic polyester elastomer—which provides the flexibility of rubber, the strength of plastics, and the processability of thermoplastics—minimizes noise penetration into vehicle cabins, making it a material of choice for air ducts and tubes in the turbocharged ICEs.

IDEAL FOR COLD AIR DUCTS

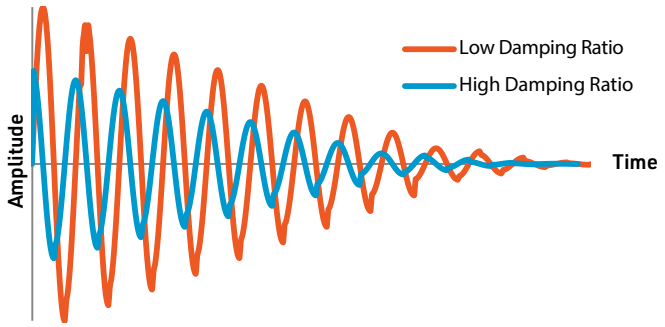
Hytrel® TPC-ET HTR8888 BK190A is ideal for cold side/fresh air ducts because it provides:

- A lightweight NVH solution: its density is similar to Hytrel® TPC-ET HTR4275 BK316, and it provides a 30% weight reduction compared to rubber hoses
- Improved damping performance covering the application range, especially in PHEV
- Similar performance to Hytrel® TPC-ET HTR4275 BK316 for resistance to fatigue, temperature, and chemicals
- High viscosity for blow molding and black color

PROVEN NOISE REDUCTION

Independent testing by a customer shows that bellows optimized with Hytrel® TPC-ET HTR8888 BK190A reduce airflow noise by 9.3dB in the range of 5-12 kHz. Plus, the use of high damping NVH material significantly reduced the radiation noise in the range of 1 to 3 kHz. (Source: A Study on NVH Performance Improvement of TPE Air Intake Hose Based on Optimization of Design and Material, SAE Paper 2019-01-1491.)

NOISE DAMPING



HYTREL® TPC-ET PERFORMANCE COMPARISON

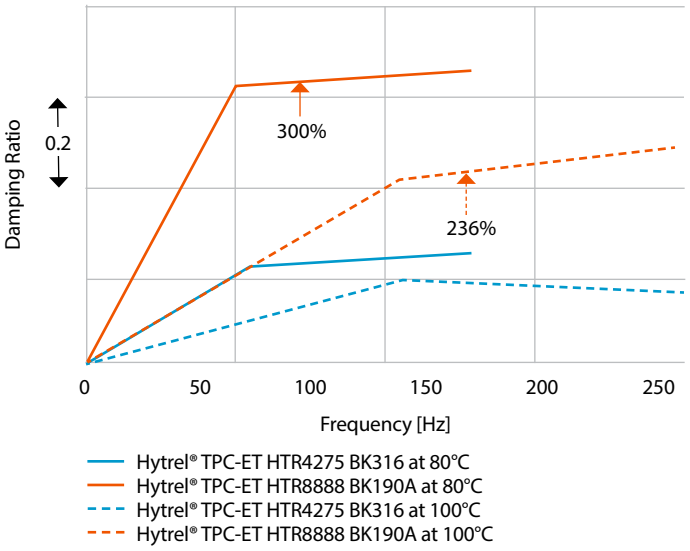
Grade	Description	E-modulus, MPA	Blow molded air ducts: In-use / Peak temperature[1], °C	MFR @ 10 kg (Temperature), g/10min	Melting Point, °C	Shore D Hardness
COLD SIDE DUCT						
HTR8441 BK316	Balance of cost and performance	190	120/150	9 (240°C)	214	52
HTR4275 BK316	Market benchmark grade	160	130/160	6 (230°C)	192	52
HTR8936 BK320	Superior chemical resistance	173	130/160	3 (240°C)	205	50
HTR8797 BK320	Superior balance in AOA[2]/cost/ processability	180	130/160	9 (240°C)	214	51
HTR8888 BK190A	**Higher damping properties**	**209**	**130/160**	**6 (230°C)**	**190**	**53**
HOT SIDE DUCT						
HTR8808 BK316	Combination of high temperature AOA and strength	270	150/180	4 (240°C)	215	54

Source: Celanese

[1] Based on air flow temperature:
- In use temperature: 1,000~3,000hrs
- Peak temperature: 100~500hrs

[2] AOA: Air Oven Aging

HYTREL® TPC-ET COMPARISON OF DAMPING RATIO



Source: Celanese

ADVANCED TESTING CAPABILITIES

Celanese is more than a materials supplier; every day we collaborate with customers to develop solutions that address their critical concerns. Automotive OEMs turn to our technical and research teams for materials science expertise and testing of:

- High noise damping air ducts
- Lightweighting
- Dimensional stability
- Complex shapes with integrated functions
- Advanced CAE (including Computed Fluid Dynamics analysis, K factors, and bellow design expertise)
- Blow molding and assembly welding support

DISCOVER MORE

For more information about using Hytrel® TPC-ET HTR8888 BK190A to reduce noise in your automotive air management systems, contact your Celanese representative.

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