

Carbon Blacks for Industrial
Rubber Product Applications

HIGH PERFORMANCE
CARBON BLACKS
FOR AUTOMOTIVE
WEATHER STRIPPING

Asia Region

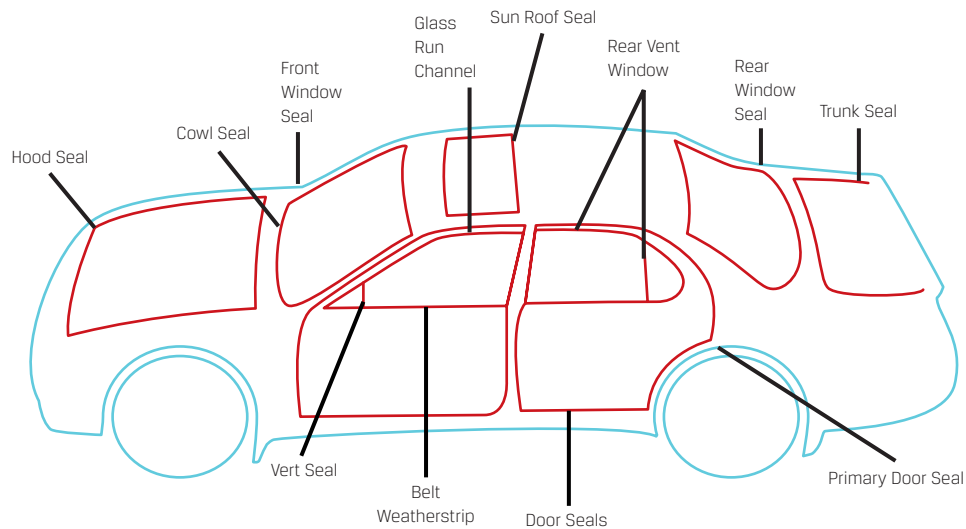
CABOT 

PROTECT
WHAT
MATTERS



Rain. Snow. Ice. Wind. Noise. The weather stripping on vehicles plays an important role in preventing water from leaking inside the passenger compartment and in reducing wind noise and dampening sound to improve ride quality for both drivers and passengers. In addition, because weather stripping is important to the overall aesthetics of the vehicle, its appearance when new and over time is a key consideration for car manufacturers.

A standard passenger car often requires 50 meter of weather stripping to seal its doors, windows, hood and trunk from the environment. Carbon black is of major importance in meeting the manufacturing, functional, aesthetic and cost requirements of automotive weather stripping. In typical EPDM-based rubber weather stripping compounds the carbon black content can be up to 30-40wt%. Because the requirements for weather stripping parts vary, we recommend carbon blacks based on specific application needs.

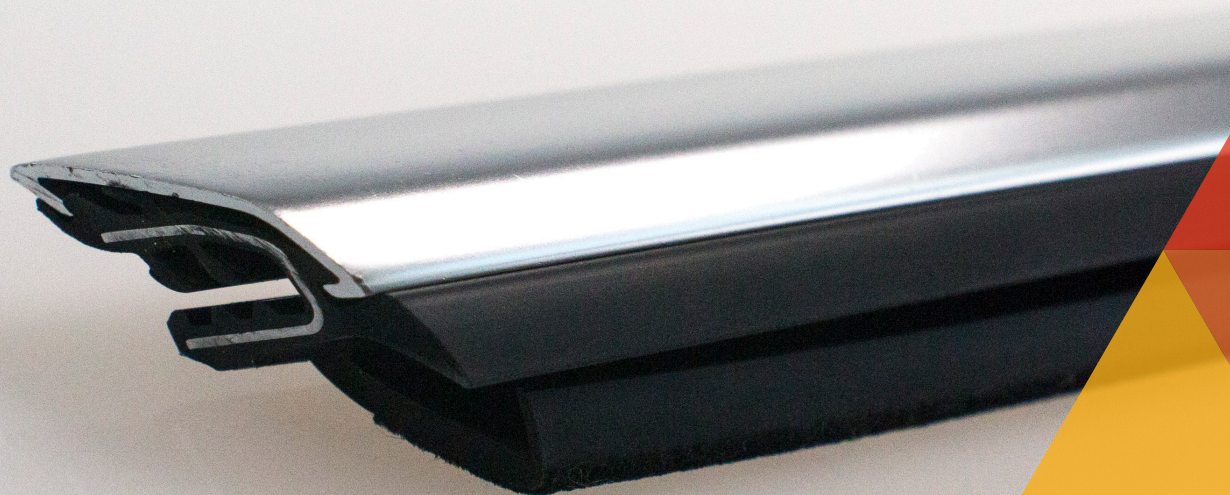


We understand the key requirements and complexities of rubber fabrication for weather stripping applications and offer a variety of carbon blacks to meet the needs of our customers around the world.

In response to changing marketplace needs in China, we are introducing new carbon blacks for weather stripping applications in the region. These products are from our SPHERON® family, which is engineered for performance, and our STERLING® family, the standard of excellence in semi-reinforcing carbon blacks.

Together, these products offer a complete portfolio of carbon blacks for both high and standard surface quality requirement hard dense, soft-medium dense, and sponge weather stripping applications.

The products include carbon blacks from our SPHERON® A series, which offers optimized carbon black morphologies with high purity and cleanliness for excellent dispersion, reduced scrap rates and "Class A" weather stripping surface finishes when compared with standard ASTM-type semi-reinforcing carbon blacks.



PRODUCT SELECTION BY APPLICATION

Cabot Product	Automotive Weather Stripping Application and Performance Requirement				
	Sponge	Soft & Medium Dense*	Hard Dense*	High Surface Quality	High Electrical Vol. Resistivity
SPHERON® 5000A carbon black	★★★★★	★★★★★	★★★	★★★★★	★★★★
SPHERON® VHA carbon black	★★★	★★★★	★★★★★	★★★★	★★
SPHERON® S0 carbon black	★★	★★★	★★★	★★★	★
STERLING® S0-1 carbon black	★	★★★★	★★★★★	★	★
SPHERON® 6400A carbon black	★★★★★	★★★★★	★★★	★★★★★	★★★★★

KEY:

★ Recommendation from 1-5 with 5 being highest.

*Soft & medium dense is hardness <80 shore A. Hard dense is hardness >80 shore A.



PRODUCT PERFORMANCE IN APPLICATION

AUTO WEATHER STRIPPING WITH HIGH SURFACE QUALITY REQUIREMENTS

SPHERON® 5000A carbon black

- ◆ Very good dispersion for automotive weather stripping with very high surface finish requirements especially sponge applications.

SPHERON® VHA carbon black

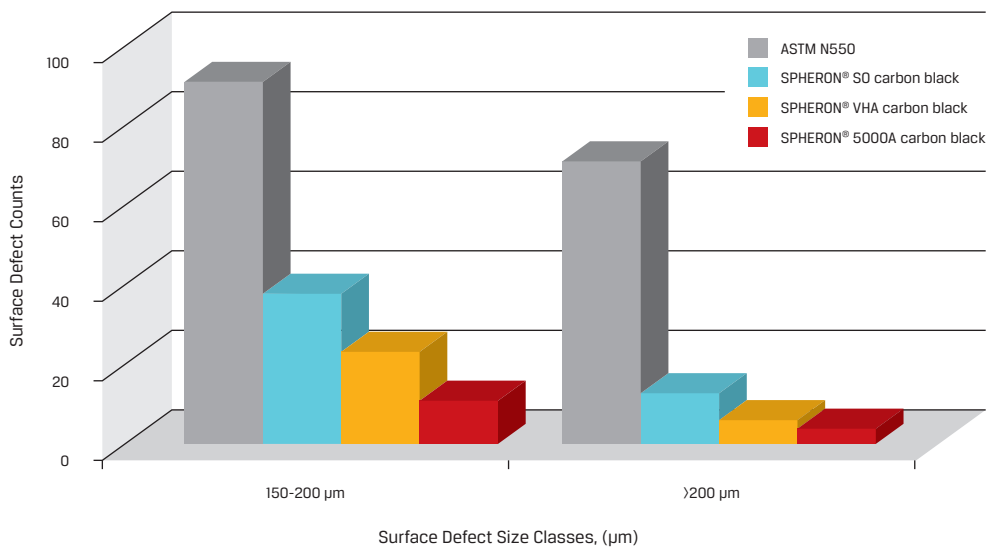
- ◆ Cost-effective product for dense and sponge automotive weather stripping with very high surface finish requirements.

SPHERON® S0 carbon black

- ◆ For general purpose automotive weather stripping.

SPHERON® 5000A carbon black exhibits the lowest defect counts, followed by SPHERON® VHA carbon black. Both A products exhibit clear improvement over SPHERON® S0 carbon black and ASTM N550 (100 EPDM, 70 Paraffinic Oil, 15 CaCO₃, Sulfur cure system).

Defect counts on 238 cm² of extruded EPDM test compound surface



SPHERON[®] VHA carbon black gives improved dispersion and can be used at similar PHR loading and does not compromise on the rubber reinforcement and compression set properties. It exhibits fewer surface imperfections compared to SPHERON[®] S0 carbon black and ASTM N550 carbon blacks (100 EPDM; 70 Paraffinic Oil; 15 CaCO₃; Sulfur cure system).

	SPHERON [®] 5000A carbon black	SPHERON [®] VHA carbon black	SPHERON [®] S0 carbon black	ASTM N550
Loading (phr)	137	125	125	125
PROCESSING PROPERTIES				
Mooney Viscosity				
ML (1+4) @ 100°C, (M.U.)	74	69	71	71
DISPERSION RATING				
Undisp defects > 80µm	101	277	346	772
PHYSICAL PROPERTIES				
Hardness				
Shore A	74	73	73	74
Tensile Properties				
Tensile Strength, (MPa)	12.9	14.1	13.8	14.9
100% Modulus, (MPa)	5.5	5.0	4.9	5.3
300% Modulus, (MPa)	12.2	12.5	11.8	13.8
Elongation @ Break, (%)	329	350	360	323
Compression Set				
22 hour @125°C, (%)	60	61	62	61



PRODUCT PERFORMANCE IN APPLICATION

AUTO WEATHER STRIPPING WITH STANDARD SURFACE QUALITY REQUIREMENTS

STERLING® SO-1 carbon black

- ◆ For fast incorporation and high extrusion speeds in less surface critical applications.

SPHERON® SO carbon black

- ◆ For general purpose automotive weather stripping.

STERLING® SO-1 carbon black can offer a quicker carbon black incorporation at acceptable dispersion with lower compound viscosity for faster overall compound processing and extrusion speed than SPHERON® SO carbon black without sacrificing reinforcement or sealing properties (100 EPDM; 70 Paraffinic Oil; 15 CaCO₃; Sulfur cure system).

	STERLING® SO-1 carbon black	SPHERON® SO carbon black
Loading (phr)	125	125
PROCESSING PROPERTIES		
Mooney Viscosity		
ML (1+4) @ 100°C, (M.U.)		
After Mixing Step 1	79	84
After Mixing Step 2	71	75
PHYSICAL PROPERTIES		
Hardness		
Shore A	71	73
Tensile Properties		
Tensile Strength, (MPa)	12.9	12.8
100% Modulus, (MPa)	4.6	4.7
300% Modulus, (MPa)	11.2	11.3
Elongation @ Break, (%)	364	360
Compression Set		
22 hour @125°C, (%)	57	54
Dispersion rating		
Undispersed defects > 80µm	Acceptable	



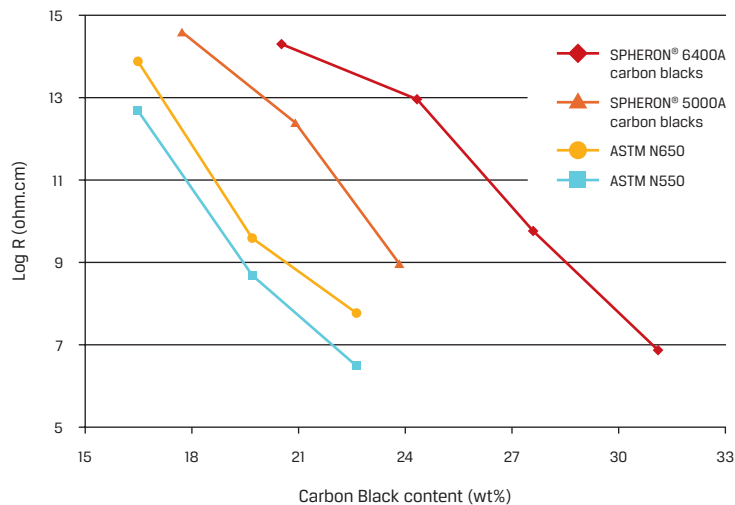
PRODUCT PERFORMANCE IN APPLICATION

AUTO WEATHER STRIPPING WITH HIGH ELECTRICAL RESISTIVITY REQUIREMENTS

SPHERON® 6400A carbon black

- ◆ For automotive weather stripping with high electrical resistivity specifications and very high surface finish.

Electrical resistivity as function of carbon black type and wt% in EPDM test compound (100 EPDM ; 50 Paraffin Oil ; Sulphur cure system). Comparison at equal 65 Shore hardness, by adjusting the carbon black/whitening loading



AUTO WEATHER STRIPPING WITH HIGH ELECTRICAL RESISTIVITY REQUIREMENTS AND LOWER DENSITY

At equal hardness and high electrical resistivity, SPHERON® 6400A carbon black offers lower compound density and better sealing properties than a high white filler based ASTM semi reinforcing carbon black compound option (100 EPDM ; 50 Paraffin Oil ; Sulphur cure system). The higher carbon black and lower white filler loading with SPHERON® 6400A carbon black offer also benefits in compound mixing , milling and extrudability.

	ASTM N550	SPHERON® 6400A carbon black
Carbon Black loading, (phr)	72	125
CaCO3 loading, (phr)	105	50
Compression Set		
Set 22 hour @100°C, (%)	55	44
Electrical Vol Resistivity		
Log R, (ohm.cm)	7.0	7.2
Hardness		
Shore A	71	73
Tensile Properties		
Tensile Strength, (MPa)	10.2	9.9
Elongation @ Break, (%)	277	263
100% Modulus, (MPa)	4.1	5.4
200% Modulus, (MPa)	7.6	8.2
Compound Density		
Density, (kg/liter)	1.32	1.27



ABOUT CABOT CORPORATION

Cabot Corporation (NYSE: CBT) is a global specialty chemicals and performance materials company, headquartered in Boston, Massachusetts. We are a leading provider of rubber and specialty carbons, activated carbon, inkjet colorants, cesium formate drilling fluids, fumed silica and aerogel.

For more information on our carbon black products for industrial rubber product applications, please visit our website at cabotcorp.com/industrialrubberproducts or by contacting our sales offices in the appropriate region:

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