

TECHNICAL Bulletin

Subject: Natural Rubber and
Chloroprene Wiper
Blades

Bulletin #: 012

Date: June 1998

THERMAX® MEDIUM THERMAL BLACK N990 IN WINDSHIELD WIPER BLADES

Thermax® N990 medium thermal carbon black, manufactured by Cancarb Limited is characterized by its large particle size and low structure. Thermax® is widely used in soft rubber applications such as windshield wiper blades, which require excellent dynamic properties and high surface quality. The large particle size (low surface area) and low structure allow for high elongation and high rebound, thereby maintaining the inherent elastomeric properties of the rubber compound. Thermax® N990 is made from high purity natural gas and has low levels of grit or sieve residue, which may cause surface imperfections on the wiper blade.

The typical properties of Thermax® N990 are as follows:

	Thermax® N990*
NSA m ² /g	9.7
DBP cc/100 g	38
pH	10
Ash Content %	0.1
325 Mesh Sieve Residue	8
Fines %	4
Pellet Crush 10 mesh	20

*Typical Properties

In this report, the use of Thermax® in a natural rubber and a polychloroprene wiper blade is demonstrated.

Natural Rubber Wiper Blade Formulation/Properties

Formulation	
SMR CV 60	100.00
Thermax® N990 Carbon Black	30.0
SRF N762 Carbon Black	40.0
Petrolatum	2.00
Vanfre AP-2	2.00
Flectol H	1.00
Sunproof Wax	1.00
UOP 688	2.00
Stearic Acid	1.00
Zinc Oxide	5.00
Sulphur	1.00
Sulfasan R	1.20
MBTS	0.60
TMTM	0.20
Santocure NS	0.65
Santoguard PVI	0.30
Properties	
Mooney Viscosity (ML 1 + 4 @ 100°C)	
Initial Reading	63.2
Minimum Viscosity	50.9
Rheometer Data (ASTM D 2084-92)	
Monsanto Rheometer @ 150°C, 3° arc	
Maximum Torque MH N•m	8.46
Minimum Torque ML N•m	1.39
Scorch Time Ts2, minutes	4.17
Cure Time, Tc90%, minutes	8.21
Physical Properties	
ASTM D 412-87, D 2240-90	
Hardness, Shore A	67
Modulus @ 100% elong (MPa)	3.40
Modulus @ 200% elong (MPa)	8.83
Modulus @ 300% elong (MPa)	14.48
Modulus @ 400% elong (MPa)	19.65
Tensile strength (MPa)	23.24
Ultimate elongation (%)	470
Tear Resistance ASTM D 624-91 N•m	50.5
Green Strength	
Ultimate Elongation (%)	650
Tensile Strength (MPa)	1.20

Chloroprene Wiper Blade Formulation

Chloroprene rubber is used in wiper blade applications to provide high heat and low temperature resistance, ozone and weathering resistance. The following is a formulation provided by a CR manufacturer.

Skyprene B-5	100
Thermax® N990 Carbon Black	50.0
MgO	4.0
Stearic Acid	1.0
Wax	0.5
Antiozonant Octamin-F	1.0
Antiozonant 4010 NA	1.0
Napthenic Oil	10.0
Accelerator ETU	1.0
Accelerator TMTD	1.0
Total	169.5