

KEVLAR®



KEVLAR® engineered elastomer with Acrylonitrile Butadiene Rubber (NBR)

**Merge 1F770
(Roll Cover Formulation)**

TEST COMPOUND FORMULATION

(see note 1)

Nitrile Rubber (Breon N36C50)	100	90	80	70	90	90	70	70
1F770	–	13	26	39	13	13	39	39
Ultrasil VN3	45	45	45	45	15	30	15	30
Zinc oxide	5	5	5	5	5	5	5	5
Stearic acid	2	2	2	2	2	2	2	2
TMQ (Flectol H)	2	2	2	2	2	2	2	2
Durez 12687	15	15	15	15	15	15	15	15
Titanium dioxide	5	5	5	5	5	5	5	5
PEG	3	3	3	3	3	3	3	3
MBTS	1	1	1	1	1	1	1	1
Sulphur	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Engineered elastomer content (pphr)	0	13	26	39	13	13	39	39
Aramid content (pphr)	0	3	6	9	3	3	9	9
Silica content (pphr)	45	45	45	45	15	30	15	30

PROPERTIES

Mooney Viscosity @ 100°C

ML 1+4	89	85	88	91	47	60	56	70
--------	----	----	----	----	----	----	----	----

Mooney Scorch MS 121°C

Time to + 5 units rise	30	28	34	26	18	24	21	24
Time to + 10 units rise	32	29	37	28	19	26	22	26
Minimum	33	34	36	38	15	21	18	26

ODR 160°C 100 Range 30 mins

M _L	8.1	9.1	9.6	13.5	3.5	5.3	5.6	7.9
T _{s2}	3	3	4	3	2	2	2	2
T ₉₀	32	28	28	26	20	25	20	24
M _H	61	62	56	73	37	48	45	55

MDR 160°C 100 Range 30 mins

M _L	8	9	10	14	4	5	6	8
T _{s2}	3	3	4	3	2	2	2	2
T ₉₀	32	28	28	26	20	25	20	24
M _H	61	62	56	73	37	48	45	55

Engineered elastomer content (pphr)	0	13	26	39	13	13	39	39
Aramid content (pphr)	0	3	6	9	3	3	9	9
Silica content (pphr)	45	45	45	45	15	30	15	30

Vulcanisate properties measured on 2 mm sheet (machine direction)

Hardness	° Shore A	81	86	91	96	71	80	80	92
Tensile St	MPa	21.4	17.8	14.4	16.2	13.4	18.1	14.7	15.6
Mod @ 10%	MPa	1.7	3.9	8.4	10.6	1.3	2.0	6.8	9.8
Mod @ 25%	MPa	2.1	6.4	12.3	15.0	3.0	4.1	13.1	15.1
Mod @ 50%	MPa	2.2	8.0	14.5	–	5.3	6.2	15.7	–
Mod @ 100%	MPa	2.5	9.3	15.1	–	7.1	7.7	–	–
E/B	%	704	585	156	49	592	655	59	47
Tear ISO 34C	kN/M	64	77	93	105	59	67	91	98

Vulcanisate properties measured on 2 mm sheet (cross machine direction)

Tensile St	MPa	21.8	17.4	13.7	11.4	16.5	18.1	10.5	10.2
Mod @ 10%	MPa	1.7	2.4	2.5	3.8	0.8	1.2	2.9	1.9
Mod @ 25%	MPa	2.1	3	3.8	5.6	1.4	3	7.7	4.7
Mod @ 50%	MPa	2.2	3.4	4.9	7.4	2.2	3	7.7	4.7
Mod @ 100%	MPa	2.5	4.5	6.7	9.8	3.5	4.2	10.3	7.1
E/B	%	694	595	461	226	668	681	146	258
Tear ISO 34C	kN/M	61	80	86	80	59	71	84	77

DIN Abrasion

Weight loss	g x 10 ⁻³	34	29	24	24	26	28	22	28
-------------	----------------------	----	----	----	----	----	----	----	----

Compression set 70 hrs @ 23 °C

	%	44	48	44	48	33	42	35	38
--	---	----	----	----	----	----	----	----	----

Dynamic Data (MTS) at Room Temperature

10 Hz

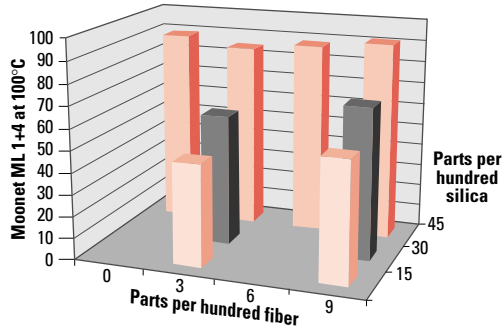
K*	N/mm	1748	1493	2077	2185	808	1111	1345	1955
K'	N/mm	1661	1420	1945	2036	771	1056	1274	1846
K''	N/mm	546	461	728	794	240	348	432	644
Tan Delta	–	0.33	0.32	0.37	0.39	0.31	0.33	0.34	0.35

30 Hz

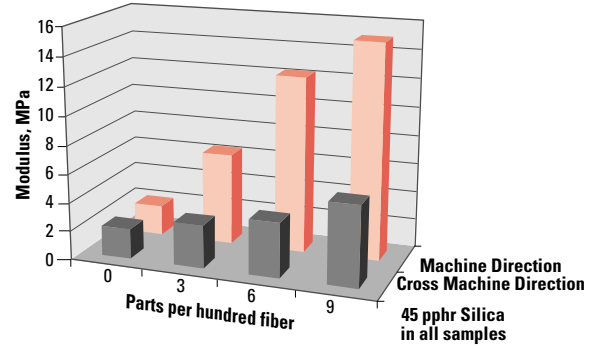
K*	N/mm	1914	1583	2281	2352	751	1239	1411	2218
K'	N/mm	1818	1505	2137	2212	717	1174	1321	2069
K''	N/mm	599	490	796	801	223	396	496	799
Tan Delta	–	0.33	0.33	0.37	0.36	0.31	0.34	0.38	0.39

Note 1 This compound formulation is based on the Textile Mill Roll formulation in “The Vanderbilt Rubber Handbook” 13th edition, page 684.

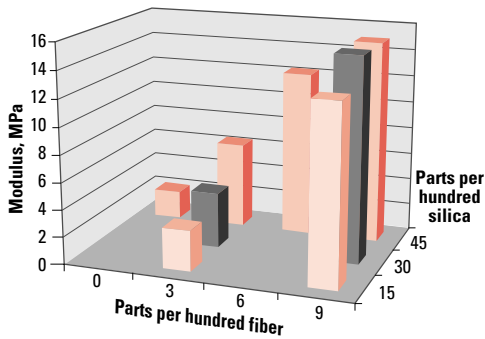
Mooney Viscosity



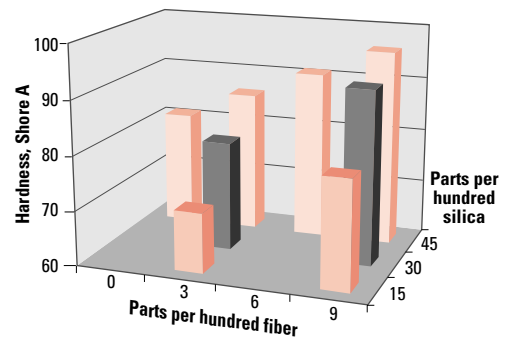
Modulus at 25% Elongation



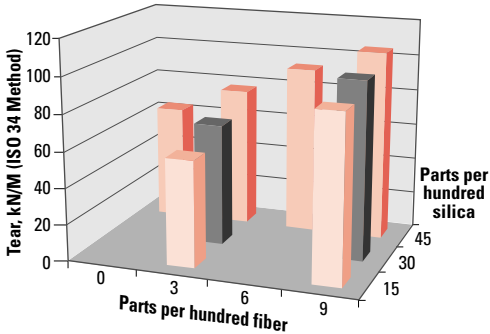
Modulus at 25% Elongation



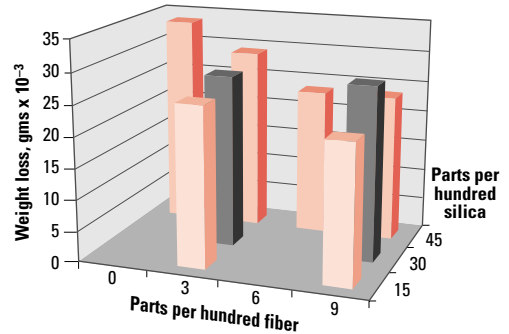
Hardness



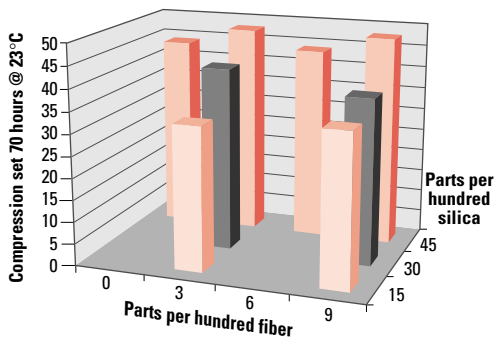
Tear



DIN Abrasion



Compression Set



- Engineered elastomer merge 1F770 contains:
 - 23 weight percent reinforcement
 - 77 weight percent of a medium ACN content NBR rubber
- Specific gravity is 1.05
- ‘Nugget’ shape product form
- Packaged in 15 kilograms kraft bags with a low melt (<100°C) EVA liner

United States and South America:

DuPont Advanced Fibers Systems
Customer Inquiry Center
5401 Jefferson Davis Highway
Richmond, VA 23234
Tel: (800) 453-8527
(804) 383-4400
Fax: (800) 787-7086
(804) 383-4132
E-Mail: afscdt@usa.dupont.com
Web Address: www.kevlar.com
"

Canada:

DuPont Canada Inc.
Advanced Fibers Systems
P.O. Box 2200
Streetsville Postal Station
Mississauga, Ontario L5M 2H3
Tel: (905) 821-5193
Fax: (905) 821-5177

Europe:

DuPont Engineering Fibres
P.O. Box 50
CH-1218 Le Grand-Saconnex
Geneva, Switzerland
Tel. ++ 41-22-717 51 11
Fax: ++ 41-22-717 60 21

Asia:

DuPont (Thailand) Limited
9-11th Floor, Yada Building
56 Silom Road
Suriyawonse, Bangrak
Bangkok 10500 Thailand
Tel: 662-2360026, 662-2384361 Ext 2702
Fax: 662-2367300

Japan:

DuPont Toray Company, Inc.
1-5-6 Nihombashi-Honcho,
Chuo-ku, Tokyo 103."Japan
Tel: 81-3-3245-5080
Fax: 81-3-3242-3183

KEVLAR® is a registered trademark of E. I. du Pont de Nemours and Company

This information represents our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experimentation. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information is subject to revision as new knowledge and experience becomes available. Since we cannot anticipate all variations in actual end-use conditions, DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right.

KEVLAR®