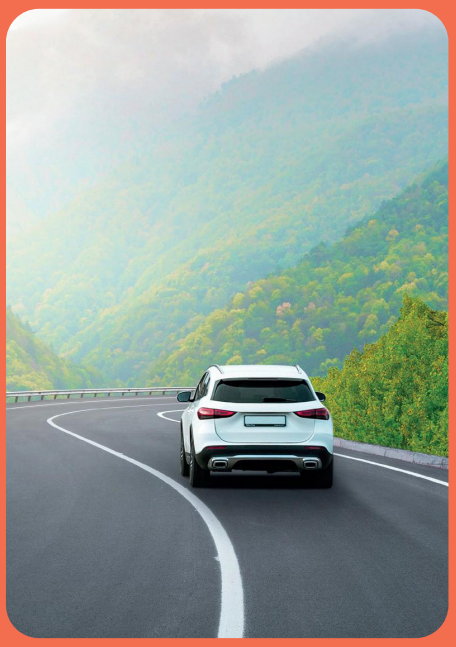
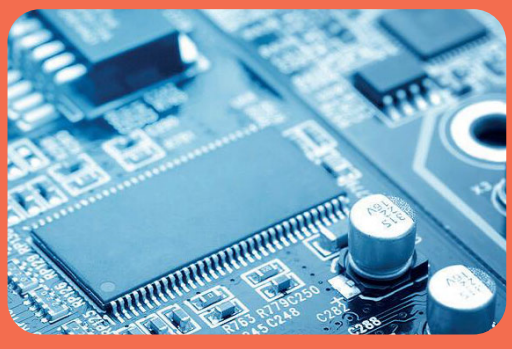
Tecnoflon® FKM and FFKM

Technical brochure

SYENSQO
ADVANCING HUMANITY





	Description		Grade	Fluorine Content (%)	Specific Gravity (g/cc) ATSM D792	Rubber Mooney Viscosity (1+10) min@ 121°C ASTM D1646	Rheology								
							MDR conditions ASTM D6601	ML (Lb*In)	MH (Lb*In)	ts2 (sec)	t'50 (sec)	t'90 (sec)	C.set 70h @ 200°C on #214 O-ring (%) ASTM D395 Method B	TR10 (°C) ASTM D1329	M A
Bisphenol curable	Base Copolymers	FKM	N 60 HS (LX)	66	1,81	28	6 min @ 177°C	0,5	18,7	90	114	165	16	-17	
		FKM	N 90 HS (LX)	66	1,81	38	6 min @ 177°C	0,8	19,9	72	86	133	15	-17	
		FKM	N 215/U	66	1,81	10	6 min @ 177°C	0,3	16,7	96	111	187	20	-17	
		FKM	N 535	66	1,81	27	6 min @ 177°C	0,8	20,3	84	102	168	13	-17	
		FKM	NM	66	1,81	48	6 min @ 177°C	1,5	22,9	74	97	150	16	-17	
		FKM	N 935	66	1,81	62	6 min @ 177°C	2,2	24	73	96	144	13	-17	
		FKM	NH	66	1,81	120	6 min @ 177°C	4,4	28,2	71	95	145	12	-17	
	Cure Incorporated Copolymers	FKM	FOR 50 HS (LX)	66	1,81	24	6 min @ 177°C	0,6	16,3	97	138	216	16	-17	
		FKM	FOR 501 HS (LX)	66	1,81	24	6 min @ 177°C	0,6	13,1	96	138	218	20	-17	
		FKM	FOR 80 HS (LX)	66	1,81	42	6 min @ 177°C	0,9	20,3	71	90	146	15	-17	
		FKM	FOR 801 HS (LX)	66	1,81	42	6 min @ 177°C	1,2	15,6	90	150	258	19	-17	
		FKM	FOR 210	66	1,81	10	6 min @ 177°C	0,3	20,2	125	149	235	22	-17	
		FKM	FOR 230	66	1,81	18	6 min @ 177°C	0,7	14,2	105	120	301	17	-17	
		FKM	FOR 539	66	1,81	20	6 min @ 177°C	0,7	23,0	95	113	181	18	-17	
		FKM	FOR 335	66	1,81	20	6 min @ 177°C	0,8	25,0	126	145	211	16	-17	
		FKM	FOR 5351/U	66	1,81	25	6 min @ 177°C	0,9	14,9	65	77	137	18	-17	
		FKM	FOR 60K	66	1,81	28	6 min @ 177°C	1,2	17,1	120	158	240	18	-17	
		FKM	FOR 7352	66	1,81	41	6 min @ 177°C	1,5	26,5	60	73	113	13	-17	
		FKM	FOR 5312K	66	1,81	43	6 min @ 177°C	1,8	15,7	72	97	169	18	-17	
		FKM	FOR 531	66	1,81	46	6 min @ 177°C	2,0	17,7	66	90	143	15	-17	
	Base Terpolymers	FKM	TN 50A	68	1,86	25	6 min @ 177°C	0,7	11,7	78	96	144	29	-14	
		FKM	TN	68	1,86	67	6 min @ 177°C	2,5	19,4	84	108	166	29	-14	
		FKM	T538	68,5	1,88	25	6 min @ 177°C	0,6	18,7	83	102	150	31	-13	
		FKM	T938	68,5	1,88	64	6 min @ 177°C	1,9	24,4	65	96	125	24	-13	
	Cure Incorporated Terpolymers	FKM	FOR 7380K	68	1,86	30	6 min @ 177°C	1,0	18,2	107	139	198	30	-14	
		FKM	FOR 5381	68,5	1,88	19	6 min @ 177°C	0,6	21,9	72	90	120	23	-13	
		FKM	FOR 9381	68,5	1,88	48	6 min @ 177°C	1,7	21,2	97	120	162	30	-13	
		FKM	FOR 9383	68,5	1,88	60	6 min @ 177°C	2,0	17,7	78	96	138	32	-13	
		FKM	FOR 9385F	68,5	1,88	38	6 min @ 177°C	1,4	10,4	42	54	84	35	-13	
		FKM	FOR 4391	70	1,89	46	6 min @ 177°C	1,2	22,7	108	132	174	32	-7	
	Low Temperature Bisphenol Curable	FKM	T 636	65,5	1,81	34	6 min @ 177°C	1,4	23,9	90	114	162	13	-19	
		FKM	T 636 /L	65,5	1,81	21	6 min @ 177°C	0,7	20,4	95	112	175	15	-19	
		FKM	FOR TF636	65,5	1,81	30	6 min @ 177°C	1,4	25,9	78	96	132	15	-19	
		FKM	FOR 5361	65,5	1,81	20	6 min @ 177°C	0,8	22,0	77	91	133	17	-19	
		FKM	FOR 6363A	65,5	1,81	30	6 min @ 177°C	1,3	25,7	133	169	228	16	-19	
		FKM	L 636	66	1,83	32	6 min @ 177°C	1,0	19,6	107	125	192	16	-21	

Description	Grade	Use	Active ingredient Content (%)	Recommended amount (phr)	Notes
Additives	FOR M1	Crosslinking agent	50	1,5-5,0	Crosslinking agent for Bisphenol / Ionic curable FKM
	FOR M2	Accelerant	30	0,5-3,0	Accelerant for Bisphenol / Ionic curable FKM
	FPA1	Processing aid	100	0,1-5,0	Melting point of 53°C, suitable to improve all FKM and FFKM compound flow and mold release

Description	Grade	Use	Active ingredient Content (%)	Notes
Specialties	FKM	NM Powder	66	Polymer Process Aid for polyolefins
	FKM	TN Latex	68	Water based terpolymer emulsion. A viable alternative to solvent based FKM coatings. 70% solid content

	Bisphenolic						
Code	2BN	4BN	5BN	6BN	1BY	2BY	3BY
Polymer	100	100	100	100	100	100	100
FOR M1	4	5	5	4	-	-	-
FOR M2	1,5	1,5	3,5	1,5	-	-	-
MgO DE	3	3	3	7	7	3	1,5
Ca(OH)2	6	6	6	-	-	6	1,5
MT Black N 990	30	30	30	30	30	30	-

Mechanical Properties				Post Cure Conditions	Comp-ound Recipe	Notes
Modulus At 100% (MPa) ASTM D412C	Tensile Strength (MPa) ASTM D412C	Elongation At Break (%) ASTM D412C	Hardness (ShA) ASTM D2240			
4,5	17,5	260	73	1h @ 250°C	6BN	Low Viscosity, curable without Ca(OH)2 - Low Post Cure Time
4,7	16,5	250	74	1h @ 250°C	6BN	Intermediate Viscosity, curable without Ca(OH)2 - Low Post Cure Time
6,3	14,7	190	72	(8+16)h @ 250°C	2BN	Very low viscosity
7,2	17,5	182	74	(8+16)h @ 250°C	2BN	Intermediate viscosity for general purpose
7,5	18,5	170	76	(8+16)h @ 250°C	2BN	Middle-high viscosity for general purpose
7,5	18,5	185	75	(8+16)h @ 250°C	2BN	High viscosity for general purpose
8,1	19,5	175	77	(8+16)h @ 250°C	2BN	Very high Viscosity with very good compression set
4,4	17,6	272	71	1h @ 250°C	1BY	Low Viscosity with low post cure time for static seals
3,6	17,6	314	69	1h @ 250°C	1BY	Low Viscosity with low post cure timefor dynamic seals
6,9	18,7	240	75	1h @ 250°C	1BY	Intermediate Viscosity with low post cure time and very good scorch safety
3,6	19,2	327	68	1h @ 250°C	1BY	Intermediate Viscosity with low post cure time and excellent hot tear resistance
7,1	17,8	187	74	(8+16)h @ 250°C	2BY	Very Low Viscosity. To be used in blends with other polymers
3,9	14,1	287	74	(8+16)h @ 250°C	2BY	Low viscosity with very good hot tear strength
6,5	16,5	188	76	(8+16)h @ 250°C	2BY	Low viscosity grade for O-ring suited for injection molding
8,0	17,0	170	76	(8+16)h @ 250°C	2BY	Low viscosity grade for O-ring suited with superior scorch safety
4,7	16,2	249	72	(8+16)h @ 250°C	2BY	Low Viscosity with high elongation and excellent mold flow for complex shapes
6,2	17,1	230	72	(8+16)h @ 250°C	2BY	Intermediate viscosity with superior metal bonding. High elongation and excellent hot tear strength
8,6	17,5	170	77	(8+16)h @ 250°C	2BY	Intermediate Viscosity with excellent compression set
3,5	10,9	335	69	(8+16)h @ 250°C	2BY	Medium viscosty grade for metal bonding applications
5,5	17,5	230	73	(8+16)h @ 250°C	2BY	Intermediate Viscosity with high elongation and superiro hot tear strength
3,7	13,5	297	72	(8+16)h @ 250°C	3BN	Low Viscosity with good chemical resistance for general purpose
6,3	17,8	230	77	(8+16)h @ 250°C	3BN	High Viscosity with good chemical resistance for general purpose
4,7	12,1	250	75	(8+16)h @ 250°C	5BN	Low Viscosity with very good chemical resistance for general purpose
6,7	15,5	218	78	(8+16)h @ 250°C	5BN	High Viscosity with veru good good chemical resistance for general purpose
5,1	16,0	247	75	(8+16)h @ 250°C	2BY	Medium-low viscosity with superior metal bonding and very good hot tear strength
6,6	15,0	200	80	(8+16)h @ 250°C	2BY	Low viscosity with excellent mold release for O-rings
5,2	17,0	255	78	(8+16)h @ 250°C	2BY	High elongation and high tensile strength for static seals
4,6	16,8	285	74	(8+16)h @ 250°C	2BY	High viscosity with very good hot tear strength for complex shapes
3,2	11,5	350	75	(8+16)h @ 250°C	2BY	Very high elongation and low viscosity for complex injiection molded items
5,9	16,0	241	78	(8+16)h @ 250°C	2BY	High viscosity with good scorch and excellent chemical resitance
7,2	18,5	187	74	(8+16)h @ 250°C	2BN	Medium viscosity base gum with low temperature grade with excellent compression set
6,9	17,5	187	73	(8+16)h @ 250°C	2BN	Low viscosity base gum with low tempersture for complex shapes
8,2	18,4	165	76	(8+16)h @ 250°C	2BY	Medium viscosity cure incorporated with excellent compression set
7,8	17,8	175	74	(8+16)h @ 250°C	2BY	Low viscosity cure incorporated with low temperature resistance
8,7	20,0	173	75	(8+16)h @ 250°C	2BY	Intermediate viscosity with excellent compression set
6,6	17,3	187	73	(8+16)h @ 250°C	2BN	Improved low tempearture resistance

Compound Recipe

BN = without cure system; **BY** = with cure system;
P = peroxide cure system; **N** = nitrilic cure system

	Description		Grade	Fluorine Content (%)	Specific Gravity (g/cc) ATSM D792	Rubber Mooney Viscosity (1+10) min@ 121°C ASTM D1646	Rheology								
							MDR conditions ASTM D6601	ML (Lb*In)	MH (Lb*In)	ts2 (sec)	t'50 (sec)	t'90 (sec)	C.set 70h @ 200°C on #214 O-ring (%) ASTM D395 Method B	TR10 (°C) ASTM D1329	M A
Peroxide curable	Peroxide Curable Terpolymers	FKM	P 457	67	1,83	21	6 min @ 177°C	0,5	26,4	24	36	54	25	-15	
		FKM	P X487S	67	1,83	21	6 min @ 177°C	0,6	23,2	26	38	61	29*	-15	
		FKM	P 757	67	1,83	44	6 min @ 177°C	1,2	24,1	25	37	55	25	-15	
		FKM	P X787S	67	1,83	41	6 min @ 177°C	1,3	22,1	27	38	62	30*	-15	
		FKM	P 459	70	1,90	24	6 min @ 177°C	0,6	29,3	24	36	53	19	-7	
		FKM	P X489S	70	1,90	19	6 min @ 177°C	0,6	30,2	22	35	58	22*	-7	
		FKM	P 959	70	1,90	48	6 min @ 177°C	1,5	28,2	23	34	53	20	-7	
		FKM	P X989S	70	1,90	37	6 min @ 177°C	1,4	27,9	22	34	52	22*	-7	
	Low Temperature Peroxide Curable	FKM	PL 458	66	1,83	23	6 min @ 177°C	0,9	30,2	24	36	48	18	-24	
		FKM	PL X488S	66	1,83	32	6 min @ 177°C	0,9	30,6	23	34	53	21*	-24	
		FKM	PL 958	66	1,83	53	6 min @ 177°C	1,9	29,4	24	35	49	18	-24	
		FKM	PL X988S	66	1,83	43	6 min @ 177°C	1,9	28,5	25	35	50	20*	-24	
		FKM	PL 557	65,5	1,81	35	6 min @ 177°C	0,9	29,1	30	42	66	21	-29	
		FKM	PL X587S	65,5	1,81	36	6 min @ 177°C	1,3	23,6	24	34	50	25*	-29	
		FKM	PL 455	64	1,78	19	6 min @ 177°C	0,5	24,7	25	36	54	23	-30	
		FKM	PL X485S	64	1,78	20	6 min @ 177°C	0,7	22,5	24	33	52	28*	-30	
		FKM	PL 855 (A353)	64	1,78	54	6 min @ 177°C	1,6	26,9	23	29	45	23	-30	
		FKM	PL X885S	64	1,78	50	6 min @ 177°C	1,7	24,7	20	30	47	28*	-30	
	Very Low Temperature Peroxide Curable	FKM	VPL 45730	67	1,87	25	6 min @ 177°C	0,7	32,0	21	30	45	19	-30	
		FKM	VPL X48730S	67	1,87	30	6 min @ 177°C	1,0	27,5	26	40	64	21*	-30	
		FKM	VPL 85730	67	1,87	45	6 min @ 177°C	1,3	30,5	23	36	57	22	-30	
		FKM	VPL X88730S	67	1,87	45	6 min @ 177°C	1,5	28,7	27	43	70	23*	-30	
		FKM	VPL 45535	65	1,85	25	6 min @ 177°C	0,9	26,0	26	38	58	23	-35	
		FKM	VPL X48535S	65	1,85	30	6 min @ 177°C	1,0	23,5	27	41	65	24*	-35	
		FKM	VPL 55540	65	1,83	25	6 min @ 177°C	0,8	26,0	25	37	58	21	-40	
		FKM	VPL X58540S	65	1,83	41	6 min @ 177°C	1,0	23,5	27	39	63	25*	-40	
		FKM	VPL 85540	65	1,83	45	6 min @ 177°C	1,3	23,5	24	36	57	20	-40	
		FKM	VPL X88540S	65	1,83	50	6 min @ 177°C	1,8	19,4	30	42	72	27*	-40	
		FKM	VPL X75545	65	1,85	32	6 min @ 177°C	0,8	20,5	27	39	59	22	-45	
		FKM	VPL X78545S	65	1,85	32	6 min @ 177°C	1,3	18,9	26	38	56	30*	-45	
Nitrilic curable	Perfluoroela-stomers	FFKM	SHP 94	>72	2,06	35	12 min @ 160°C	0,9	28,0	40	60	150	21	-2	
		FFKM	PFR 94	>72	2,06	35	12 min @ 160°C	0,5	26,8	38	60	137	19	-2	
		FFKM	SHP 86	>72	2,05	75	12 min @ 160°C	1,2	24,8	40	60	135	23	-2	
		FFKM	PFR 06HC	>72	2,05	75	12 min @ 160°C	2,0	23,0	71	137	315	20	-2	
		FFKM	SHP 95	>72	2,03	40	12 min @ 170°C	0,8	14,4	76	154	386	31	-1	
		FFKM	PFR 95	>72	2,03	35	12 min @ 170°C	0,6	14,3	79	154	369	30	-1	
		FFKM	SHP 95HT	>72	2,03	50	12 min @ 170°C	1,1	19,1	70	135	307	30	-1	
		FFKM	PFR 95HT	>72	2,05	75	12 min @ 170°C	2,7	21,1	55	123	364	21	-1	
		FFKM	PFR 5910M	>72	2,06	95	12 min @ 160°C	2,0	13,5	61	95	220	20	1	
		FFKM	PFR 5920M	>72	2,08	115	12 min @ 160°C	3,5	17,4	58	104	245	23	1	
		FFKM	SHP LT	>72	2,00	25	12 min @ 160°C	2,1	27,3	35	100	360	31	-30	
		FFKM	PFR LT	>72	2,00	25	12 min @ 160°C	1,9	29,0	30	70	280	27	-30	
		FFKM	PFR 1065O	>72	2,06	80	30 min @ 170°C	1,2	12,8	330	530	800	16	-2	
		FFKM	PFR 1075O	>72	2,07	100	30 min @ 170°C	2,9	18,7	150	600	900	21	-2	
		FFKM	PFR 1055B	>72	2,03	50	30 min @ 170°C	0,9	15,3	350	590	1130	8	-3	
		FFKM	PFR 2160B	>72	2,03	95	30 min @ 170°C	2,5	16,2	265	560	1160	8	-3	

	Peroxide						Nitrilic	
Code	1P	3P	4P	5P	6P	7P	1N	2N
Polymer	100	100	100	100	100	100,0	100,0	100,0
Luperox 101 XL 45	3	2,5	1,5	-	2	1,5	-	-
Luperox 101 (98%)	-	-	-	1	-	-	-	-
Drimix TAIC (75%)	4	4	-	-	5	-	-	-
ZnO	5	-	5	-	5	5	-	-
MT Black N 990	30	-	10	-	30	15	20	-
Austin Black 325	-	-	10	-	-	-	-	-
N550 carbon black	-	25	-	-	-	-	-	-
BOAP	-	-	-	-	-	-	0,7	1,2

Mechanical Properties				Post Cure Conditions	Comp-ound Recipe	Notes
Modulus At 100% (MPa) ASTM D412C	Tensile Strength (MPa) ASTM D412C	Elongation At Break (%) ASTM D412C	Hardness (ShA) ASTM D2240			
5,9	22,8	239	72	(1+4)h @ 230°C	1P	Low viscosity with superior hot tear strenght and relaxation behaviour
6,1	25,7	250	71	(1+4)h @ 230°C	1P	NFS - Low viscosity with superior hot tear strenght and relaxation behaviour
4,9	23,4	290	71	(1+4)h @ 230°C	1P	High viscosity with superior hot tear strenght and relaxation behaviour
5,1	25,8	260	72	(1+4)h @ 230°C	1P	NFS - High viscosity with superior hot tear strenght and relaxation behaviour
8,4	23,7	205	76	(1+4)h @ 230°C	1P	Low viscosty with outstanding chemical resistance
12,3	26,8	170	75	(1+4)h @ 230°C	1P	Low viscosty with outstanding chemical resistance
6,8	22,0	230	72	(1+4)h @ 230°C	1P	Intermediate viscosty with outstanding chemical resistance
10,4	25,9	194	75	(1+4)h @ 230°C	1P	Intermediate viscosty with outstanding chemical resistance
7,8	20,8	182	73	(1+4)h @ 230°C	1P	Low viscosity best in class for chemical and fuel resistance
11,1	18,3	138	74	(1+4)h @ 230°C	1P	NFS - Low viscosity best in class for chemical and fuel resistance
7,5	20,4	192	72	(1+4)h @ 230°C	1P	Intermediate viscosity best in class for chemical and fuel resistance
9,9	19,4	160	75	(1+4)h @ 230°C	1P	NFS - Intermediate viscosity best in class for chemical and fuel resistance
6,1	19,5	210	71	(1+4)h @ 230°C	1P	Intermediate viscosity with improved chemcal resistance and very good low temperature resistance
6,0	21,7	212	69	(1+4)h @ 230°C	1P	NFS - Intermediate viscosity with improved chemcal resistance and very good low temperature resistance
5,3	21,3	227	70	(1+4)h @ 230°C	1P	Low viscosity with excellent low temperature performances
5,6	22,5	225	69	(1+4)h @ 230°C	1P	NFS - Low viscosity with excellent low temperature performances
4,8	20,8	248	69	(1+4)h @ 230°C	1P	High viscosity with excellent low temperature performances
6,4	24,5	221	70	(1+4)h @ 230°C	1P	NFS - High viscosity with excellent low temperature performances
7,9	19,3	176	74	(1+4)h @ 230°C	6P	Low viscosity with excellent resistance to engine oils and fuel permeation
5,7	17,1	180	70	(1+4)h @ 230°C	6P	NFS - Low viscosity with excellent resistance to engine oils and fuel permeation
8,0	18,8	187	72	(1+4)h @ 230°C	6P	Intermediate viscosity with excellent resistance to engine oils and fuel permeation
8,8	19,9	174	72	(1+4)h @ 230°C	6P	NFS - Intermediate viscosity with excellent resistance to engine oils and fuel permeation
6,7	14,6	166	68	(1+4)h @ 230°C	6P	Intermediate viscosity with improved low temperature and chemical resistance to oxygenated oils
5,5	19,2	220	68	(1+4)h @ 230°C	6P	NFS - Intermediate viscosity with improved low temperature and chemical resistance to oxygenated oils
7,2	15,0	172	68	(1+4)h @ 230°C	6P	Low viscosity with outstanding low temperature resistance
6,1	16,3	188	67	(1+4)h @ 230°C	6P	NFS - Low viscosity with outstanding low temperature resistance
6,9	15,8	174	67	(1+4)h @ 230°C	6P	Intermediate viscosity with outstanding low temperature resistance
5,3	16,2	210	69	(1+4)h @ 230°C	6P	NFS - Intermediate viscosity with outstanding low temperature resistance
4,2	14,2	198	62	(1+4)h @ 230°C	6P	Intermediate viscosity best in class in low temperature resistance
4,6	15,4	209	68	(1+4)h @ 230°C	6P	NFS - Intermediate viscosity best in class in low temperature resistance
15,3	22,5	129	75	4h @ 230°C	2P	Chemical resistant FFKM designed for very demanding sealing applications
9,2	18,5	150	71	4h @ 230°C	2P	High purity chemical resistant FFKM designed for very demanding sealing applications
8,3	20,3	170	71	4h @ 230°C	2P	Extreme chemical resistant FFKM, with improved resistance to hot amines
6,5	19,0	185	70	4h @ 230°C	2P	High purity extreme chemical resistant FFKM, with improved resistance to hot amines, suited for chemical etch semiconductor applications
6,8	21,9	195	76	(8+16)h @ 290°C	7P	FFKM based on a proprietary curing system for improved thermal resistance up to 280°C, also in hot water and steam
5,6	19,3	206	70	(8+16)h @ 290°C	7P	High purity FFKM based on a proprietary curing system for improved thermal resistance up to 280°C, also in hot water and steam
8,0	19,6	213	70	(8+16)h @ 290°C	4P	FFKM based on a proprietary curing system, offering the best thermal rating among the peroxide curing grades, with outstanding hot steam resistance
6,9	18,3	224	72	(8+16)h @ 290°C	4P	High purity FFKM, based on a proprietary curing system, offering the best thermal rating among the peroxide curing grades, with outstanding hot steam resistance
2,5	17,8	285	62	4h @ 230°C	5P	Translucent high purity self-reinforcing FFKM grade, without particle release in semiconductor etch applications
4,7	18,7	260	73	4h @ 230°C	5P	Translucent high purity self-reinforcing FFKM grade, without particle release in semiconductor etch applications
7,3	18,9	190	79	4h @ 230°C	3P	Unique FFKM designed to combine excellent chemical resistance with extremely low temperatures
7,2	18,4	200	77	4h @ 230°C	3P	High purity unique FFKM designed to combine excellent chemical resistance with extremely l ow temperatures
2,3	10	225	65	(8+16)h @ 290°C	2N	High purity self-reinforcing FFKM grade, with high thermal rating, without particle release in semiconductor etch applications
3,6	12,5	240	75	(8+16)h @ 290°C	2N	High purity self-reinforcing FFKM grade, with high thermal rating, without particle release in semiconductor etch applications
6,8	17,3	165	66	(8+16)h @ 290°C	1N	High purity FFKM with oustanding thermal resistance and excellent sealing properties at extreme temperatures
10,4	20,9	145	69	(8+16)h @ 290°C	1N	High purity FFKM with oustanding thermal resistance and longest service life at extreme temperatures

* C.set of NFS grades is strongly dependent on the compound formulation.
To get the best c.set a fine tuning of the compound formulation is necessary.

Compound Recipe

BN = without cure system; **BY** = with cure system;
P = peroxide cure system; **N** = nitrilic cure system

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