MIRACTRAN®

Thermoplastic Polyurethane (TPU)

Introduction

[MIRACTRAN®] is the trade name for the thermoplastic polyurethane elastomers manufactured and sold by Nippon Miractran Co.,Ltd. established in 1965.

[MIRACTRAN®] has excellent physical properties and good and easy processability. [MIRACTRAN®] is most suitable for injection molding and extrusion molding and it can also be blow molding, calender molding, and inflation molding etc.

[MIRACTRAN®] is indeed an outstanding polyurethane elastomer. We, Nippon Miractran Co., Ltd, will give the answer to customer through the TPU business.

Characteristics of [MIRACTRAN®]

[MIRACTRAN®] is one of the best product among thermoplastic elastomers, which has the excellent properties.

1. [MIRACTRAN®] is specifically featured by its superior Abrasion Resistance.
   It is much superior in abrasion resistance to natural or synthetic rubber and other thermoplastic elastomers.
2. Remarkable Mechanical Strength
   [MIRACTRAN®] has far stronger tensile strength than natural or synthetic rubber by double to threefold, it serves the purpose of thinning and decreasing the weight of the final products.
3. Low Temperature Resistance.
   When placed in low temperature, [MIRACTRAN®] continues to have favorable elasticity and resilience, scarcely showing any change in its hardness.
4. Resistant capacity to Oil and Gasoline is most favorable.
5. Resistance to Weathering and to the effect of Ozone is considered most appropriate.
6. [MIRACTRAN®] can be easily colored by mixing it with coloring agents, as by a mixer.
7. The Thermoplastic Moulding Process can be put to the same effective use as before.
   Sprues, runners and other elements can be repeatedly utilized.

Applications

Moulding	Field	Applications
Injection	Automotive parts	Ball joint, Dust cover, Door locks striker, Steering assembles, Side protection mouldings, antenna jackets, etc.
	Machinery parts	Gaskets, Packings, O'ring, Caps, Washers, etc.
	Foot Wear	Ski-boot shells, Soles of work shoes and sports shoes, Motor bike boots, etc.
	Others	Roller skate wheels, Caster, Ear-tags, Watch-band, Snow chains, Hammer heads, etc.
Extrusion	Hose·Tube	High pressure hose, Gardening hose, Irrigation hose, Liner for fire hose, Pneumatic tube, etc.
	Film	Seat cover, Artificial leather, Lifejackets, Drain linings, Keyboard covers, etc.
	Wire·Cable	Cable sheathing (car parts), Cable insulation
	Others	Rope, Round-belt, V-belt, etc.
Calender	Conveyer belt, Flexible container, Fabric laminates, etc.	
Blow	Car parts	
Inflation	Various kinds of film (20～400μ)	
Solution	Binder, Adhesives, Artificial leather coatings	

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Standard Grade
E type

Grades		Hardness JIS A or D	100%Mo (MPa)	Tensile Strength (MPa)	Elongation at break (%)	Tear Strength (kN/m)	Specific Gravity	Rebound Resilience (%)	Compression Set (%)	Vicat Softening Temperature (℃)	Taber Abrasion Loss H22(mg)	Glass Transition Temperature (℃)	Base Polyol
E100	E180	80A	5	43	680	93	1.21	59	30	95	20	-45	Ester
	E185	85A	7	46	630	113	1.22	50	—	110	27	—	
	E190	90A	10	46	580	137	1.22	45	32	118	35	-43	
	E195	95A、46D	12	48	530	157	1.22	38	—	122	50	—	
	E198	97A、53D	17	48	520	167	1.23	38	35	125	60	-39	
E300	E380	80A	5	35	680	88	1.11	62	32	90	17	-61	Ether
	E385	85A	7	43	580	108	1.11	56	—	97	23	—	
	E390	90A	9	46	480	123	1.12	55	40	114	30	-55	
	E395	94A、46D	12	48	480	137	1.12	45	—	120	45	—	
	E398	97A、53D	17	48	440	167	1.12	40	32	131	58	-46	
E500	E580	80A	4	47	580	93	1.16	61	30	100	15	-49	Ester
	E585	85A	6	47	530	118	1.17	55	—	116	20	—	
	E590	90A	9	51	480	137	1.18	49	31	130	25	-48	
	E595	95A、46D	12	53	480	147	1.18	42	—	131	35	—	
	E598	97A、53D	14	55	450	177	1.19	39	34	141	55	-43	
	E559	59D	18	52	450	196	1.20	—	33	—	—	—	
	E564	64D	25	54	400	226	1.21	39	35	145	70	—	
	E568	68D	29	55	350	255	1.23	—	40	—	—	—	
	E574	74D	42	56	350	294	1.23	39	42	151	90	—	
E900	E980	80A	6	47	480	98	1.17	55	40	105	20	-34	Carbonate
	E985	85A	8	49	440	118	1.18	44	—	108	25	—	
	E990	90A	10	54	390	137	1.19	36	30	115	31	-29	
	E995	95A、46D	14	57	390	157	1.20	30	—	132	40	—	
	E998	97A、53D	20	59	390	157	1.21	30	—	140	57	-28	

＊ Above data is not guaranteed but the average from actual result.

- ●Testing method ：JIS K 7311、K 6262、K 7206
- ●Compression Set ：70℃×22h
- ●Softening Temperature ：Vicat、Load 9.8N
- ●Abrasion Loss ：Taber、H-22、Load 9.8N 、1000 rotations
- ●Glass Transition Temperature ：DSC

P type

Grades		Hardness JIS A or D	100%Mo (MPa)	Tensile Strength (MPa)	Elongation at break (%)	Tear Strength (kN/m)	Specific Gravity	Rebound Resilience (%)	Compression Set (%)	Vicat Softening Temperature (℃)	Taber Abrasion Loss H22(mg)	Glass Transition Temperature (℃)	Base Polyol
P400	P485	85A	5	49	560	88	1.19	46	43	101	30	-46	Ester
	P490	90A	6	52	530	98	1.20	39	42	111	50	-44	
P20M	P22M	82A	4	39	680	88	1.21	53	56	64	28	-40	Ester

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- ●Testing method ：JIS K 7311、K 6262、K 7206
- ●Compression Set ：70℃×22h
- ●Softening Temperature ：Vicat、Load 9.8N
- ●Abrasion Loss ：Taber、H-22、Load 9.8N 、1000 rotations
- ●Glass Transition Temperature ：DSC

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Special Grade

Specialty	Grades	Hardness JIS A or D	100%Mo (MPa)	Tensile Strength (MPa)	Elongation at break (%)	Tear Strength (kN/m)	Specific Gravity	Note
Low compression set	H585FNAT H590FSOR H595FNAT H985FNAT	85A 91A 95A、46D 85A	7 11 15 9	40 40 40 40	520 500 480 400	100 120 135 100	1.18 1.19 1.20 1.19	Compression set 21% 21% 21% 21%
Low Hardness	E660MNAT E665MNAT E670MNAT	60A 65A 70A	2 2 3	25 26 28	900 880 850	49 54 59	1.14 1.14 1.14	Plasticizer/Blend
	E660MZAA E665MZAA E670MZAA E675MNAT E370MSJP E375MSJP	60A 65A 70A 75A 70A 75A	2 2 3 3 3 3	16 20 22 29 20 25	1200 1000 1100 800 880 750	50 56 65 62 62 69	1.13 1.14 1.14 1.14 1.07 1.11	Ester ↑ ↑ ↑ Ether ↑
	C565PNAT	65A	4	10	540	60	1.19	PVC/Blend
Aliphatic TPU	XN-2001 XN-2002	85A 90A	5 6	49 57	770 610	76 117	1.15 1.15	Carbonate Carbonate
Flame Retardative	E585PUOO E590PUOO E394PUBA U385PSWI U390PSWI U385PSWJ U385PSZX U390PSZX	84A 88A 93A 85A 90A 85A 85A 90A	8 9 12 8 9 8 8 11	34 39 38 35 38 34 31 30	550 500 530 510 490 520 600 540	108 118 136 98 104 98 98 115	1.23 1.23 1.16 1.22 1.23 1.24 1.17 1.19	V-2 V-2 V-0 Non halogen、V-2 Non halogen、V-2 Non halogen、V-2 Non halogen、V-0 Non halogen、V-0
Electro-conductive	K595PSNO K22MPSJW	95A 90A	14 8	19 18	440 600	114 98	1.23 1.24	Volume resistivity 10^3～10^4Ωcm
prevention of static charge	E390PSRY	87A	8	25	600	112	1.12	Volume resistivity 10^8～10^9Ωcm
Low friction, Low abrasion loss	F595FCOO	97A	12	41	450	137	1.25	Fluororesin/Blend
Hot melt (Aliphatic TPU)	E785MSNN E790MSJR E785MSOV-NT	85A 90A 85A	4 6 4	13 13 13	930 830 880	74 87 83	1.15 1.15 1.15	Flow start temperature 105℃ 110℃ 115℃

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●Testing method ：JIS K 7311、K 6262、K 7206、C60695-11-10 Method B　●Compression Set ：70℃×22h

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Special Grade

Specialty	Grades	Hardness JIS A or D	100%Mo (MPa)	Tensile Strength (MPa)	Elongation at break (%)	Tear Strength (kN/m)	Specific Gravity	Note
Calendering	E380PSNT	80A	5	26	660	87	1.11	
Blow moulding	E585PBOO	85A	7	41	550	118	1.17	
Inflation (moulding) film	E390PFAC	90A	7	30	650	110	1.12	
Good injection mouldability	P433RNAT P890RSUA	81A 90A	5 8	22 39	750 480	88 103	1.10 1.18	
Dope-coatings	P22SRNAT E980PMOO	82A 80A	4 5	36 34	630 460	83 96	1.21 1.19	

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●Testing method ：JIS K 7311

＊ **There is a product that cannot correspond immediately about special grade.**
If you have any questions, please feel free to contact us.