

TECHNICAL INFORMATION

Materials

1. Basic Concepts

Simrit processes highly elastic materials, polyurethanes, thermoplastics and thermosets for seals and moulded parts.

Some general information follows on this aspect, in particular a summary of materials, their composition and possible applications, as well as their limitations in use.

- natural rubber and synthetic rubber, are known as high polymers that can be changed by vulcanisation to the highly elastic state
- elastomers are in addition all cross-linked high polymers with highly elastic properties

- thermoplastics are high polymers that are not cross-linked and that can be permanently deformed under the action of pressure and temperature; they possess soft elastic properties to a low degree

- thermoplastic rubbers are uncross-linked high polymers. They are processed like thermoplastics and possess outstanding elastic properties.

- thermosets are cross-linked high polymers that are hard elastic with very low ability to deform.

The main structural features of the high polymer materials are explained in detail in DIN 7724.

2. Codes

2.1 Glossary of material codes

Elastomers		
Chemical name for the base polymers	Code in accordance with	
	ASTM D 1418	ISO 1629
Acrylonitrile-butadiene rubber	NBR	NBR
Hydrogenated acrylonitrile-butadiene rubber	HNBR	HNBR
Chlorobutadiene rubber	CR	CR
Carboxylated nitrile rubber	XNBR	XNBR
Acrylate rubber	ACM	ACM
Ethylene-acrylate rubber	AEM	AEM
Silicone rubber		
methyl polysiloxane	MQ	MQ
vinyl-methyl polysiloxane	VMQ	VMQ
phenyl-vinyl-methyl polysiloxane	PVMQ	PVMQ
phenyl-methyl polysiloxane	PMQ	PMQ
Fluorosilicone rubber		
fluoromethyl polysiloxane	FVMQ	FVMQ
Fluoro elastomer	FKM	FKM
perfluoro elastomer	FFKM	FFKM
Polyurethane rubber		
polyester-urethane rubber	AU	AU
polyether-urethane rubber	EU	EU
Ethylene-oxide-epichlorhydrin rubber	ECO	ECO
Epichlorhydrin polymer	CO	CO
Chlorosulphonated polyethylene	CSM	CSM
Natural rubber	NR	NR
Isoprene rubber	IR	IR
Polybutadiene rubber	BR	BR
Styrene-butadiene rubber	SBR	SBR
Ethylene propylene diene rubber	EPDM	EPDM
Ethylene propylene copolymer	EPM	EPM



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Elastomers		
Chemical name for the base polymers	Code in accordance with	
	ASTM D 1418	ISO 1629
Butyl rubber	IIR	IIR
Chlorobutyl rubber	CIIR	CIIR
Bromobutyl rubber	BIIR	BIIR
ASTM = American Society for Testing and Materials; ISO = International Organization for Standardization; DIN = Deutsches Institut für Normung e.V.		

Thermoplastics		
Chemical name of the base materials	Code in accordance with	
	DIN 7728, Part 1, ISO 1043.1	ASTM D 1600
Polytetrafluoroethylene	PTFE	PTFE
Ethylene-tetrafluoroethylene copolymer	E/TFE	E/TFE
Perfluoroalkoxy copolymer	PFA	PFA
Polyvinyl chloride	PVC	PVC
Acrylonitrile-butadiene styrene	ABS	ABS
Styrene acrylonitrile	SAN	SAN
Polypropylene	PP	PP
Polyamide	PA	PA
Polyoxymethylene (polyacetal)	POM	POM
Polyphenylene oxide	PPO	PPO
Polysulphone	PSU	PSU
Polyetherblockamide	PEBA	PEBA
Polyether ketone	PEEK	PEEK
Polyetherimide	PEI	PEI

Thermosets		
Chemical name of the base materials	Code in accordance with	
	DIN 7728, Part 1 + 2, ISO 1043.1	ASTM D 1600
Unsaturated polyester	UP	UP
Phenol-formaldehyde	PF	PF
Urea formaldehyde	UF	UF
Glass fibre reinforced, unsaturated, polyester resin	UP-GF	

Thermoplastic rubbers	
Chemical name for the base polymers	ASTM code
	D 1418
Block polymer of styrene and butadiene	YSBR
Polyetherester	YBPO
Thermoplastic polyolefin	TPO

2.2 Material Codes

Materials are named using codes and also have numbers placed before and after the symbol, e.g.: 72 NBR 902. The prefix denotes the hardness of the material in Shore A. The group of letters identifies the base polymer

as per DIN/ISO 1629. The number after the group of letters is an internal compound code number.



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2.3 Summary of some trade names for elastomers and plastics

Elastomers	
Chemical name	Trade names
Acrylonitrile-butadiene rubber (NBR)	Perbunan, Hycar, Chemigum, Breon, Butakon, Europrene N, Butacril, Krynac, Paracril, Nipol, Nitriflex
Chlorobutadiene rubber (CR)	Neoprene, Baypren, Butaclor, Denka Chloroprene
Acrylate rubber (ACM)	Cyanacryl, Europrene AR, Noxite PA, Nipol AR
Ethylene acrylate (AEM)	Vamac
Silicone rubber (VMQ, FVMQ and PVMQ)	Silopren, Silastic, Silicone, Rhodorsil
Fluoro elastomer (FKM)	Viton, Fluorel, Tecnoflon, Dai El, Noxite
Perfluoro elastomer (FFKM)	Kalrez, Simriz, Chemraz
Polyurethane (AU and EU)	Vulkollan, Urepan, Desmopan, Adipren, Estane, Elastothane, Pellethane, Simputhan
Ethyleneoxide-epichlorhydrin rubber (ECO)	Epichlomer, Hydrin, Gechron
Styrene-butadiene rubber (SBR)	Buna Hüls, Buna SB, Europrene, Cariflex S, Solprene, Carom
Ethylene propylene diene rubber (EPDM)	Dutral, Keltan, Vistalon, Nordel, Epsyn, Buna AP, Royalene, Polysar EPDM
Butyl rubber (IIR)	Enjoy Butyl, Esso Butyl, Polysar Butyl
Chlorosulphonated polyethylene (CSM)	Hypalon

Plastics for seal applications	
Chemical name	Trade names
Acrylonitrile-butadiene styrene (ABS)	Cyclocac, Novodur, Terluran
Acetal resin polyoxymethylene (POM)	Delrin, Hostaform C, Ultraform
Polyamide (PA)	Durethan, Dymetrol, Nylon, Rilsan, Ultramid, Vestamid
Polybutyleneterephthalate (PBTP)	Crastin, Pocan, Ultradur, Vestodur
Polyethylene (PE)	Alathon, Baylon, Hostalen, Lupolen
Polycarbonate (PC)	Lexan, Makrolon
Polyphenylene oxide (PPO)	Noryl
Polypropylene (PP)	Hostalen PP, Novolen
Polystyrene (PS)	Hostyren, Lustrex, Vestyron
Polytetrafluoroethylene (PTFE)	Algoflon, Fluon, Halon, Hostaflon, Teflon
Ethylene-tetrafluoroethylene copolymer (ETFE)	Tefzel
Polyvinyl chloride (PVC)	Breon, Hostalit, Plaskon
Perfluoroalkoxy copolymer (PFA)	Teflon-PFA
Phenolic resin hard fabric	Ferrozell, Pertinax

Classification According to ASTM D 200/SAE J 200

This classification system is intended to assist the user in the choice of the material to be used. It enables the materials to be specified by using simple qualitative characteristics for Shore hardness, strength values, temperature behaviour and swelling behaviour etc.

Details of this system can be found in the Annual Book of ASTM Standards "Rubber" Volume 09.01 and 09.02.

The ASTM classification for individual materials are given in the Tables →5.2.3.



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