

EURO RUBBER

TECHNICAL COMPOUNDS

CERTECH GROUP

TECHNICAL COMPOUNDS

& EXPERIENCE
KNOWLEDGE

 **THINK GREEN**
ECO LIFE

WE MOVE FORWARD WITH INNOVATION

EURO RUBBER

TECHNICAL COMPOUNDS



**RAW
MATERIALS**



R&D



PRODUCTION



QUALITY

WHO WE ARE MISSION AND VISION

EURORUBBER
TECHNICAL COMPOUNDS

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PROPER SOLUTIONS IN THE SHORTEST TIME

We will use our 50 years' experience in the rubber industry to understand your problems and, finally, propose compounds and solutions tailored to your needs.

We base our work on the relationship with customers. Our goal is to build long lasting partnerships with you.

Our laboratories, production units and technical staff will always be available to work with you on the development of new projects and to face new challenges.

We always consider the customer first and at the heart of our company.

For these reasons, from EURORUBBER, you can expect more!

BETT**ER** STRONG**ER** FAST**ER**

OUR STRENGTH

We respond quickly to customer requests. We follow our products in their performance, in all phases of working life. We study the market evolution so that our compounds are updated and capable to satisfy increasingly demanding performance and regulations.

ECO FRIEND

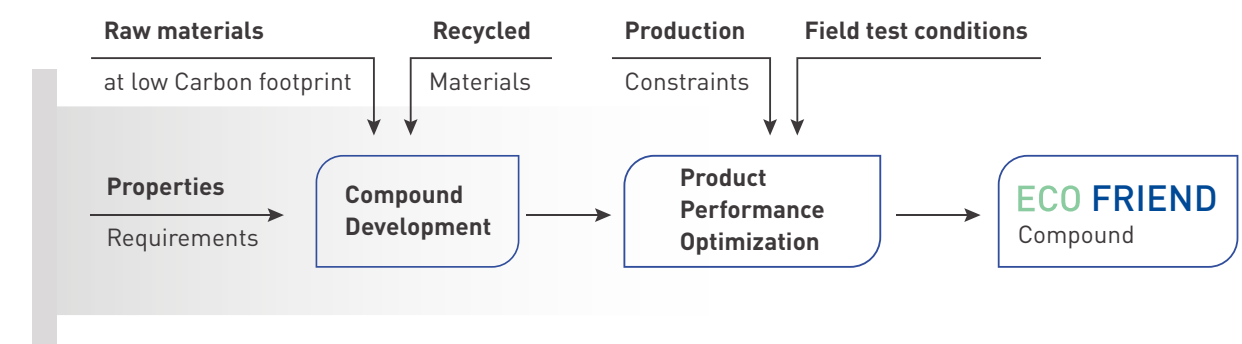


Climate change is already affecting the entire world, with extreme weather conditions such as drought, heat waves, heavy rain, floods and landslides becoming more frequent, including in Europe. Other consequences of the rapidly changing climate are rising sea levels, ocean acidification and loss of biodiversity.

In order to limit global warming, carbon neutrality must be achieved by 2050. Carbon neutrality means having a balance between emitting carbon and absorbing carbon from the atmosphere in natural carbon sinks (soil, woods, oceans) that, unfortunately, are able to remove only 25% of global GHG emissions. Therefore, to pursue carbon neutrality is necessary to proceed through a carbon offset that consists of GHG emissions reduction used to compensate for emissions that occur elsewhere. This can be done through investment in renewable energy, energy efficiency or other clean, low-carbon technologies.

Rubber industry and, particularly, tyre sector is rapidly moving forward to achieve GHG emission reduction indicated in the various national plans. In all sectors of rubber industry, the concept of circular economy is becoming increasingly important. Circular economy consists in the recovery and valorization of all phases of the life of a product: raw materials, production, performances in the field and End of Life management with recovery and recycling of materials of which is made.

Since ever, Eurorubber provides rubber compounds in the sector of tyre retreading (Car, light truck, heavy duty truck, OTR), solid tyres and technical goods. Company target is to become leader in material recovery and their recycle proposing to customers compounds with low carbon footprint maintaining unchanged or improved main performances of products where the compounds are utilized.



TECHNICAL COMPOUNDS

TECHNICAL SPECIFICATIONS AS PER ASTM D-2000 REGULATION

The graph in the following page is obtained in compliance with prescriptions contained in the ASTM D-2000 standard classification system of elastomeric materials.

Following such a system, elastomeric materials are divided into "type" (resistance to high temperatures) and "class" (resistance to swelling in oil). "Type" and "class" are designated by alphabetical letters, one after the other. The first letter indicates the "type" while the second letter indicates the "class". For example, BC means type B and class C, GE means type G and class E. ASTM D-2000 prescribes that heat resistance of elastomers should be measured after ageing for 72hrs in air at indicated temperature. As basic requirement, the elastomeric material will be defined as resistant to heat at the indicated temperature if the variation in percentage of tensile at break vs. original values is not more than +/-30, if Elongation at break is not lower than 50% and hardness Shore A does not change more than +/-15 points.

Applying the evaluation criteria just mentioned, temperatures at which elastomeric materials should be exposed to determine the "type" are indicated in the table below that reports thermal levels and relative "type" letters.

ASTM D-2000 Oil resistance of elastomeric material is measured by swelling in volume after ageing in oil IRM903 for 70 hours at indicated temperature as per type definition.

However, due to oil thermal stability, 150 °C is maximum temperature at which test can be carried out, even for materials that can resist to higher temperature.

Maximum swelling values and relative "class" letters are listed in the table below : from swelling of 140% for a material of class B to 10% for a material of class K. Class A materials do not require any resistance to oil and indicates elastomers not oil resistant such as NR natural rubber, EPDM ethylene propylene terpolymers, etc).

CLASS	MAX. VOLUME SWELLING (%)
A	No Requirements
B	140
C	120
D	100
E	80
F	60
G	40
H	30
J	20
K	10

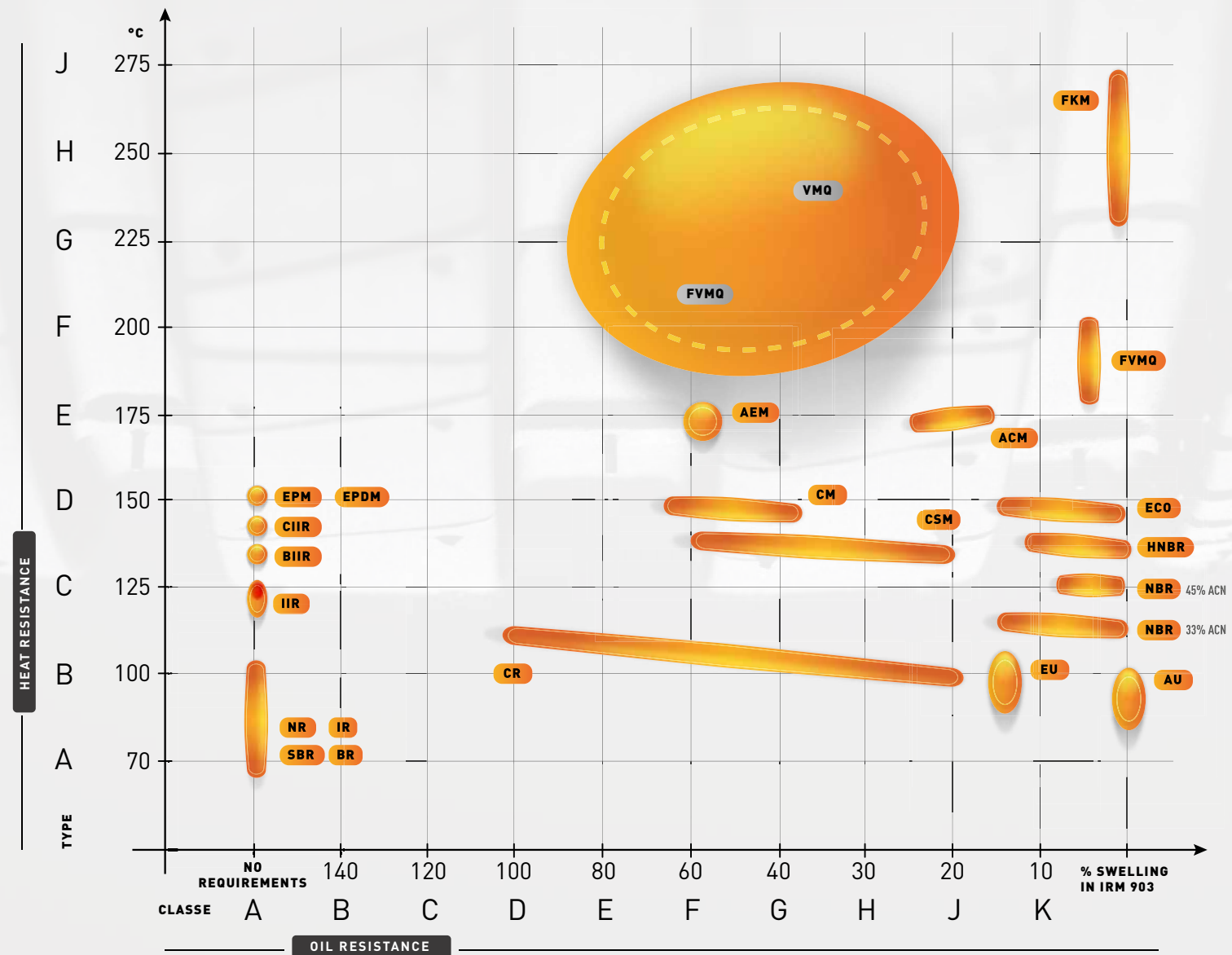
TYPE	TEST TEMPERATURE °C
A	70
B	100
C	125
D	150
E	175
F	200
G	225
H	250
J	275
K	300

Therefore, when for a specific application an elastomeric material BC is required, it means that should be resistant in oil showing swelling not higher than 120% at 120 °C and resistant to dry heat at 120 °C following above mentioned criteria (tensile break not lower than 30%, Elongation at break not lower than 50% and hardness within +/- 15 points).

It is clear that if a product resistant to heat at 115 °C (in between types B and C) and shows swelling between class C (120%) and D (100%), the material should be still defined as BC

HEAT Resistance

OIL Resistance



Additional example : a material FH should be resistant to 200 °C and not showing swelling in oil more than 30% at maximum test temperature of 150 °C.

Heat and oil resistance is fundamental to characterize an elastomeric material for automotive applications but it is not sufficient for a precise and complete assessment of the elastomer.

For this reason, ASTM D-2000 classification system will specify "Grade" numbers, "suffix " letters and "suffix" numbers to provide all other parameters (hardness, mechanical properties, low temperature behavior , ozone resistance etc.) and determine their values. Now, we can move on the graph and choose basic elastomers for the working conditions (temperature and media exposition) at which the compounds will be submitted in their life.

Polymer Legend

NR	Natural Rubber
IR	Poly-Isoprene
BR	Poly-Butadiene
SBR	Styrene Butadiene Rubber
IIR	Butyl Rubber
CIIR, BIIR	Chloro and Bromo Butyl Rubber
EPM	Ethylene Propylene Copolymer
EPDM	Ethylene Propylene Terpolymer
CR	Poly Chloroprene
NBR	Nitrile Rubber
NBR/PVC	Nitrile/PVC Rubber
CSM	Polyethylene Choro Sulfonated
CM	Polyethylene Chlorurated
ACM	Acrylic Rubber
EACM (o AEM)	Ethylene Acrylic Rubber
AU	Poly Urethane Rubber Esther type
EU	Poly Urethane Rubber Ether type
ECO, ETER (o AECO)	Epichlorohydrin Rubber (Copolymer and terpolymer)
CO	Epichlorohydrin Rubber , Homopolymer
VMQ, PVMQ	Silicone Rubber
FVMQ	Fluorosilicone Rubber
FKM	Fluoro Carbon Rubber

CHEMICAL/ PHYSICAL REQUIREMENTS

The letters which define type and class of the material are normally followed by three numbers that indicate essential physical properties like hardness Shore A X 10 (+/- 5) and minimum value of tensile at break expressed in MPa. As example , a material that should comply with specification ASTM D-2000 M2 BG717 will be requested to be heat resistant at 100 °C (B), show swelling not higher than 40% (G) in IRM903, have Shore A hardness of 70 (+/-5) (7) and minimum tensile break of 17 (MPa) (17). Therefore , if we go on the graph Temperature-Swelling, we can say that the material complying with specification ASTM 2000 M2 BG717 could be NBR (33% ACN) compound with 70 shore A harness and minimum tensile break of 17 Mpa. These values represent basic requirements for an elastomeric compound . Additional requirements will be determined by suffixes listed in the side table,

Meaning of Suffix Letters

SUFFIX LETTER	TEST REQUIRED
A	Heat Resistance
B	Compression Set
C	Ozone or Weather Resistance
D	Compression-Deflection Resistance
EA	Fluid Resistance (Aqueous)
EF	Fluid Resistance (Fuels)
EO	Fluid Resistance (Oils and Lubricants)
F	Low-Temperature Resistance
G	Tear Resistance
H	Flex Resistance
J	Abrasion Resistance
K	Adhesion
M	Flammability Resistance
N	Impact Resistance
P	Staining Resistance
R	Resilience
Z	Any special requirement, which shall be specified in detail

with a number which defines the test to be carried out (in below table most significant):

ASTM Test Methods

Basic Requirements and First Suffix No.	Basic	1	2	3	4	5	6	7	8	9
Requirement or Suffix Letter										
Tensile Strength, Elongation	D 412	-----	-----	-----	-----	-----	-----	-----	-----	-----
Durometer Hardness	D 2240	-----	-----	-----	-----	-----	-----	-----	-----	-----
Suffix A, Heat Resistance	-----	D 573, 70h	D 865, 70h	D 865, 168h	D 573, 168h	D 573, 1000h	D 895, 1000h	-----	-----	-----
Suffix B, Compression Set	-----	D 395, 22h Method B, solid	D 395, 70h Method B, solid	D 395, 22h Method B, pilled	D 395, 70h Method B, pilled	D 395, 1000h Method B, solid	D 395, 1000h Method B, pilled	-----	-----	-----
Suffix C, Ozone or Weather Resistance	-----	D 1171, Ozone ^A exposure, Method A	D 1171, ^B weather	D 1171, Ozone ^C exposure, Method B	-----	-----	-----	-----	-----	-----
Suffix EO, Oil Resistance	-----	D 471, IRM 901 Oil No. 1, ^D 70h	D 471, IRM 902 Oil No. 2, ^D 70h	D 471, IRM 903 Oil No. 3, ^D 70h	D 471, IRM 901 Oil No. 1, ^D 168h	D 471, IRM 902 Oil No. 2, ^D 168h	D 471, IRM 903 Oil No. 3, ^D 168h	D 471, Service Liquid No. 101, 70h	D 471, Oil as specifically designated in Table 6, 70h	-----

And a second number which defines the test temperature:

Suffix Numbers to Indicate Temperature of Test

Applicable Suffix Requirements	Second Suffix Number	Test Temperature, °C ^A
A, B, C, EA, EF, EO, G, K	11	275
	10	250
	9	225
	8	200
	7	175
	6	150
	5	125
	4	100
	3	70
	2	38
	1	23
F	0	B
	1	23
	2	0
	3	-10
	4	-18
	5	-25
	6	-35
	7	-40
	8	-50
	9	-55
	10	-65
11	-75	
12	-80	

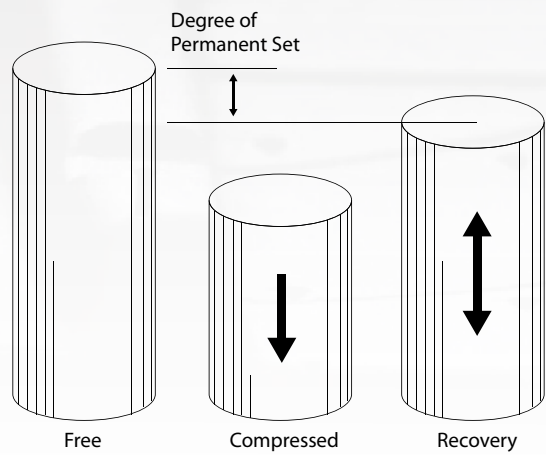
A material with code ASTM 2000 M2 BG717 A14 B14 E034 should be a compound capable to resist to: A14 – at dry heat temperature 100 °C for 70hrs (D573 test code), B24 – at compression set (50% max.) temperature of 100 °C for 22hrs (D395 test code), E034 – at swelling (40% max) when exposed to IRM903 oil temperature 100C for 72hrs (D412 test code).

MECHANICAL Requirements

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10

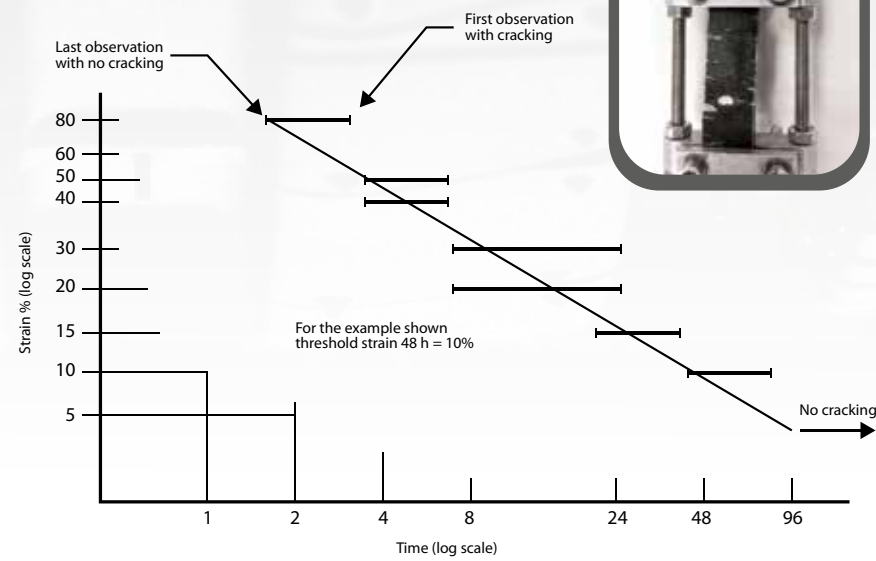
Eurorubber can carry out laboratory tests following ASTM regulations and can design compounds capable to comply with specifications as per standard classification system for automotive applications. In this regard, in addition to basic test like hardness and stress-strain, we show the most representative that Eurorubber can perform in own laboratories for compound definition and quality control during supplying period:

COMPRESSION SET

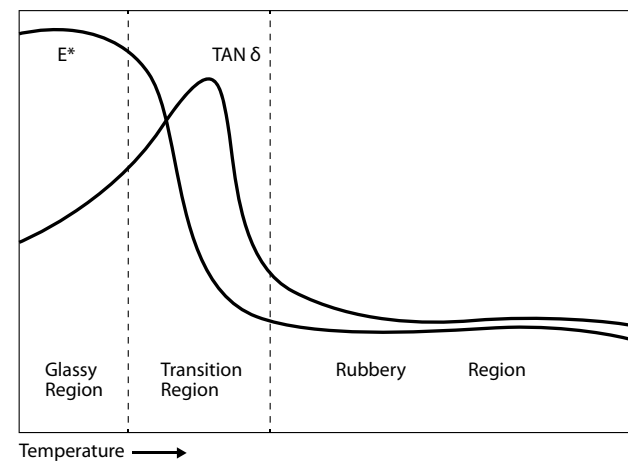
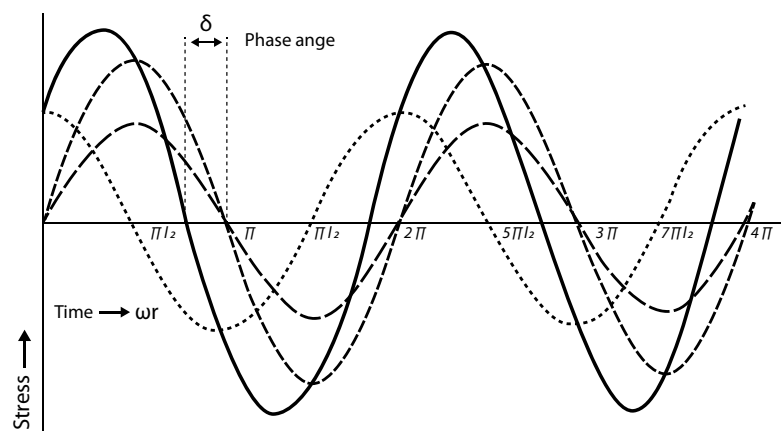


$$\text{Compression set at constant strain} = \frac{t_o - t_r}{t_o - t_s} \times 100$$

OZONE RESISTANCE



VISCOELASTIC PROPERTIES



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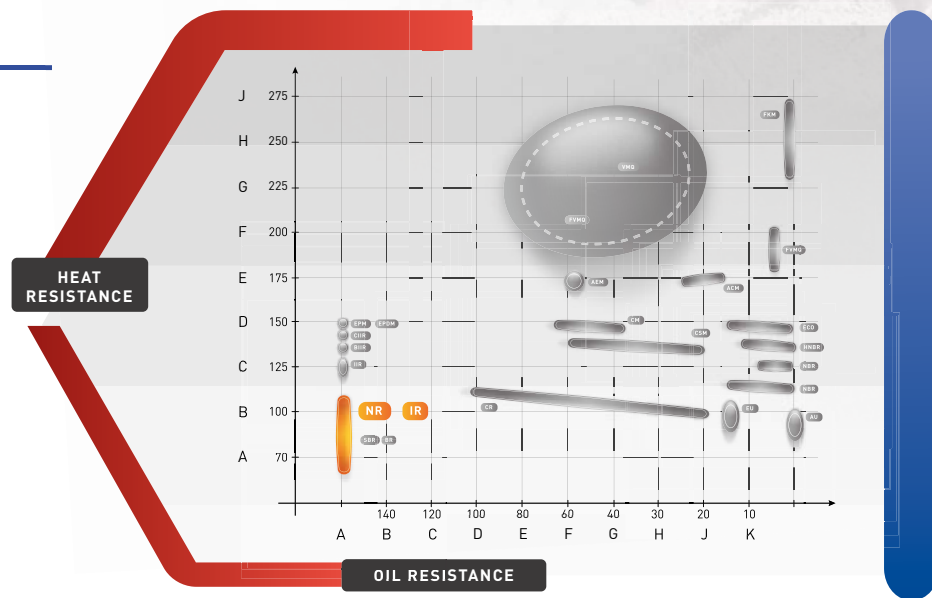
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ACM



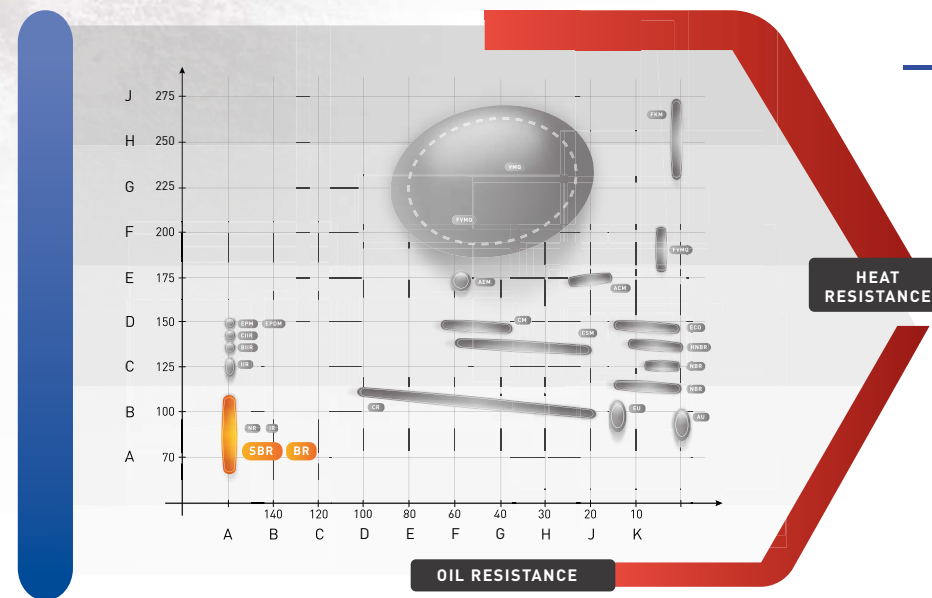
NR

NATURAL RUBBER /
POLY-ISOPRENE



SBR • BR

STYRENE-
BUTADIENE RUBBER



Classification

Natural rubber is extracted from the EVEA Brasiliensis rubber tree on plantations in Africa, Asia and South America. The molecular structure is that of cis-polyisoprene 1,4. Natural rubber is classified according to international specifications that take into account purity and viscosity.

Polymer type

Natural rubber and polyisoprene are distinguished by their excellent mechanical properties (breakage load and tear resistance) even without reinforcing charges. In addition, the derived compounds show excellent elastic yield, resistance to permanent deformation and creep.

Applications

In addition to extensive use in tires, NR and IR are used in compounds for applications where elastic yield, mechanical strength and resistance to permanent deformation / creep are fundamental: anti-vibration, engine supports (bearings and bushing), solid tires.

Classification

While BR has the chemical structure of 1,4 cis-Polybutadiene, SBR is the copolymer Styrene / butadiene and is produced in both emulsion and solution. There are many grades of SBR on the market that differ in their styrene content (from 23.5 to 45%) and the extension to oils.

Polymer type

SBR and BR are normally used in cutting each other or with NR and combine the good mechanical qualities of the SBR with the excellent abrasion resistance of the BR.

Applications

In addition to the extensive use in tires, SBR and BR are also widely used in the technical article, high abrasion resistances (such as conveyor belts) are required and where the requirements of chemical and temperature resistance are not high.

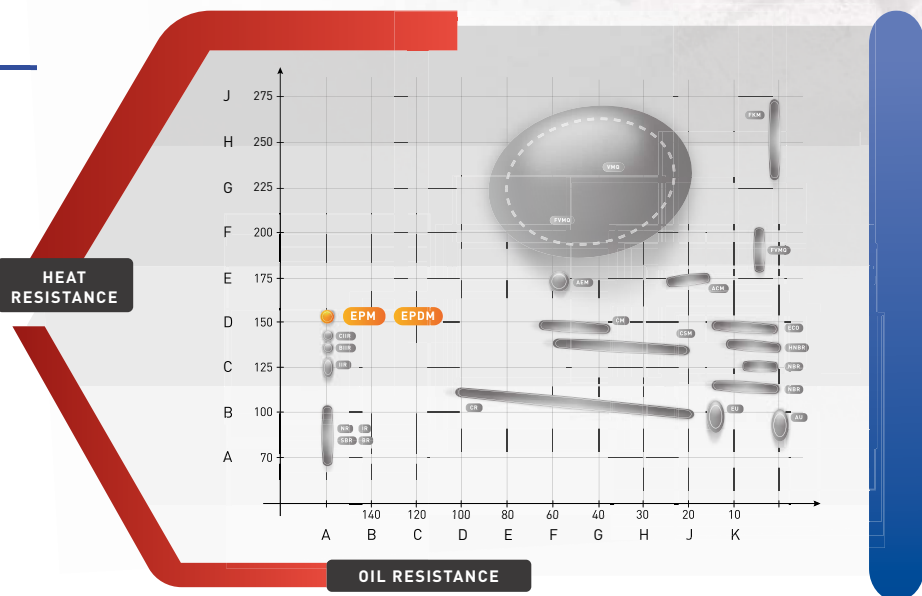
Carico rottura	Mpa	25	25	23	23
Allungamento	%	700	650	550	500
C. set. 22H@70 °C	%	15	18	20	22
Rebound	%	75	70	65	60
Durezza ShA	pti	40	50	60	65
Resistenza al calore					
72 H @100 °C					
Carico rottura	%	-10	-10	-10	-10
Allungamento	%	-10	-10	-10	-10
Durezza ShA	pti	+5	+5	+5	+5

Durezza ShA	pti	60	70	75	85
Carico rottura	Mpa	22	20	18	18
Allungamento	%	600	500	400	350
C. set. 22H@70 °C	%	25	30	45	50
Abrasion	DIN, CC	0,090	0,085	0,080	0,080
Resistenza al calore					
72 H @100 °C					
Carico rottura	%	-20	-20	-25	-20
Allungamento	%	-30	-30	-35	-30
Durezza ShA	pti	+10	+10	+10	+8



EPDM

ETHYLENE / PROPYLENE RUBBERS



HEAT RESISTANCE

OIL RESISTANCE

Classification

The copolymer (EPM) and terpolymer (EPDM) ethylene propylene (diene) belong to an interesting elastomer family whose properties of atmospheric and chemical agents resistance, good behaviour to high and low temperatures, good electric characteristics make them interesting for valued applications at competitive costs.

Polymer type

The most important parameters that characterize the properties of the ethylene-propylene elastomers are:

- molecular weight
- ethylene content
- type and quantity of third monomer

The combinations of above, allows to choose the most appropriate types for the different applications.

Copolymers, with fully saturated polymers chain, offer better heat and chemical resistance, while terpolymers are preferred for wider process flexibility.

Applications

The vulcanized items based on ethylene-propylene compounds are characterized by the following properties:

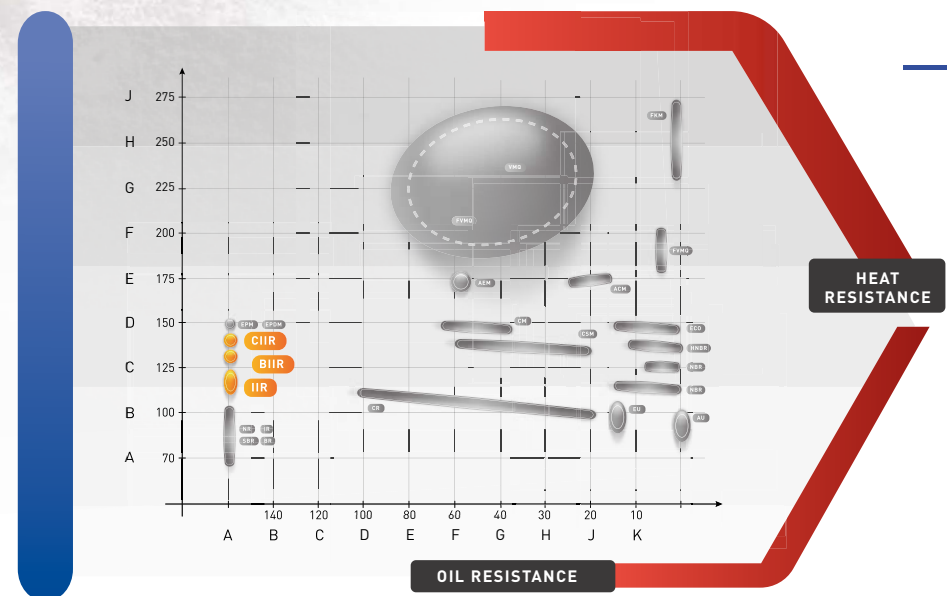
- excellent ozone and oxygen resistance both under static and dynamic conditions
- excellent weathering and UV resistance
- good high temperature resistance (up to 150°C) in dry and humid conditions
- good low temperature resistance (down to -55°C)
- excellent dielectric characteristics
- good resistance to wide range of chemical products (organic and inorganic acids, alcohol, amines, antifreeze liquids, bleaching agents, detergents)
- low water permeability

The application fields range from the sector of the transports to the electric cables. Very important it is the presence in the electric household appliances, house building, polyolefin and motor oil modification, waterproofing membranes, footwear, "food-grade" and "potable water" applications.

TIPO DI POLIMERO		TERPOLIMERO	COPOLIMERO
Durezza ShA	pti	70	50
Carico rottura	Mpa	14	12
Allungamento	%	350	550
C. set. 22H@70 °C	%	15	
C. set. 70H@100 °C	%	40	40
Brittle point	°C	-45	-48
Resistenza al calore		72 H @100 °C	
Carico rottura	%	+5	+4
Allungamento	%	-35	-8
Durezza ShA	pti	+5	+3

IIR • BIIR CIIR

BUTYL / HALO-BUTYL RUBBER



HEAT RESISTANCE

OIL RESISTANCE

Classification

Butyl rubber is an isobutylene-isoprene copolymer that can be chlorinated or brominated (between 1 and 2%) to obtain the Chlorine (CIIR) and Bromobutyl (BIIR) versions.

Polymer type

These polymers have good mechanical qualities up to operating temperatures of 120 °C but their most important feature is the very high impermeability to air and gases.

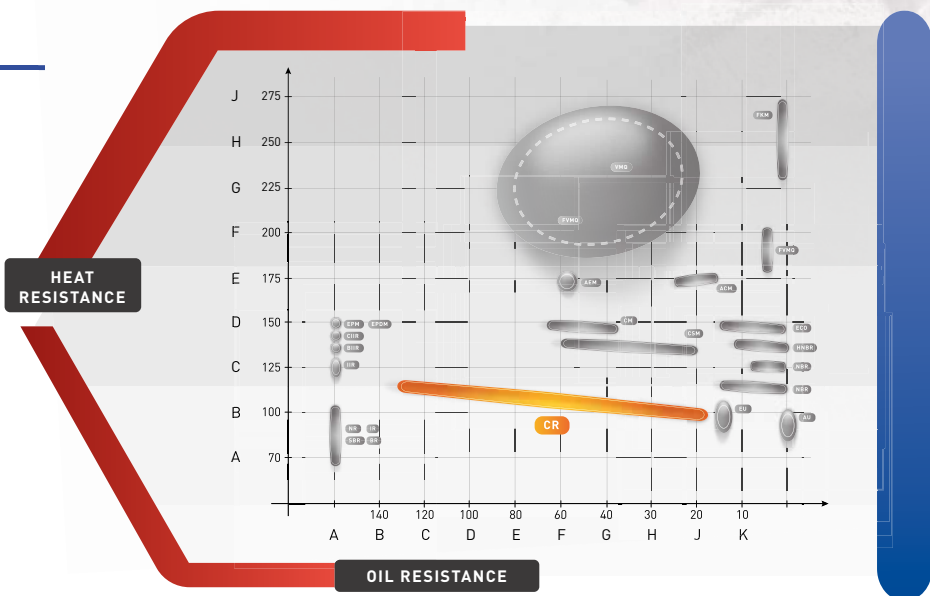
Applications

In addition to extensive use in tires and inner tubes (resistance to loss of inflation pressure), these elastomers are widely used in the field of membranes.

		IIR	CIIR
Durezza ShA	pti	60	40
Carico rottura	Mpa	12	10
Allungamento	%	550	750
C. set. 22H@70 °C	%	25	25
Brittle point	°C	-50	-50
Resistenza al calore		72 H @100 °C	
Carico rottura	%	-5	+10
Allungamento	%	-10	-10
Durezza ShA	pti	+3	+5



CR
POLYCHLOROPRENE



NBR
NITRILE RUBBERS



Classification

These elastomers are polymers based on 2-chlorobutadiene. Introduced commercially in 1931 by Dupont, their processing characteristics and performance are able to fulfil the most needs of the rubber industry. The final articles based on polychloroprene, properly designed, are distinguished for good weathering and ozone resistance. The chlorine presence also gives a good fire and oil resistance as well as a good chemical inactivity as against many chemical agents. Moreover they show good mechanical properties and elastic behaviour, low abrasion and good heat resistance.

Polymer type

The available types substantially belong to two distinguished families: sulphur and mercaptan modified. Fundamental differences concern the performances and more precisely the mechanical characteristics and the compression set.

Applications

Polychloroprene is often used to replace natural and styrene-butadiene rubber when typical requirements are:

- ozone resistance
- fire resistance
- good oil resistance

Following applications can be considered:

- molded and extruded items for automotive industry, chemistry, mining, house building and agriculture
- printing rolls and rolls for paper industry
- cables
- belts for automotive and industrial equipments
- conveyor belts for house building and mining industry
- rubber textile
- sponge articles
- water-proofing linings
- industrial foot wears
- adhesive

Classification

Nitrile elastomers are polymers based on butadiene acrylonitrile. The base manufactured articles of such rubbers show an elevated fuel, aliphatic solvent, oil and vegetable fats, mineral and synthetic oil resistance. Furthermore nitrile rubbers provide vulcanized items with excellent mechanical characteristics, low compression set, elevated abrasion resistance and low permeability to gas. These manufactured articles can withstand temperatures that vary from -50 to +125°C.

Polymer type

Nitrile elastomers are classified according to acrylonitrile content that can range from 18% to 50%. The different combinations influence mainly the low temperatures flexibility and the chemical resistance.

Applications

Nitrile rubber is used for a wide range of applications where the needs are high oil and fuel resistance. Such application sectors are the most different and they

involve the chemical and oil industry, automotive, house building, food industry. The compounds based on NBR can be transformed using the typical rubber technologies: compression or injection moulding, extrusion, calendaring and vulcanization in hot air or steam.

It is possible to design tailor-made compounds according to particular applications or specifications. The articles and fields involved are:

- moulded and extruded items for the automotive, chemistry, mining, building and agriculture industry
- printing rolls and for paper industry
- conveyor belts for building and mining industry
- industrial and military foot wears
- gasoline and oil hoses
- seals and gasket
- brake and clutch seals
- foam lines for thermal insulation
- O-rings

TIPI A MERCAPTANO

TIPI A ZOLFO

		70	50	70
Durezza ShA	pti	70	50	70
Carico rottura	Mpa	15	16	18
Allungamento	%	250	450	550
C. set. 22H@100 °C	%	18	25	30
Resistenza al calore 72H@120°C				
Carico rottura	%	-10	-5	-10
Allungamento	%	-40	-10	-50
Durezza ShA	pti	+7	+9	+6
ASTM N.1 70H@100 °C				
Volume	%	+15	+20	+10

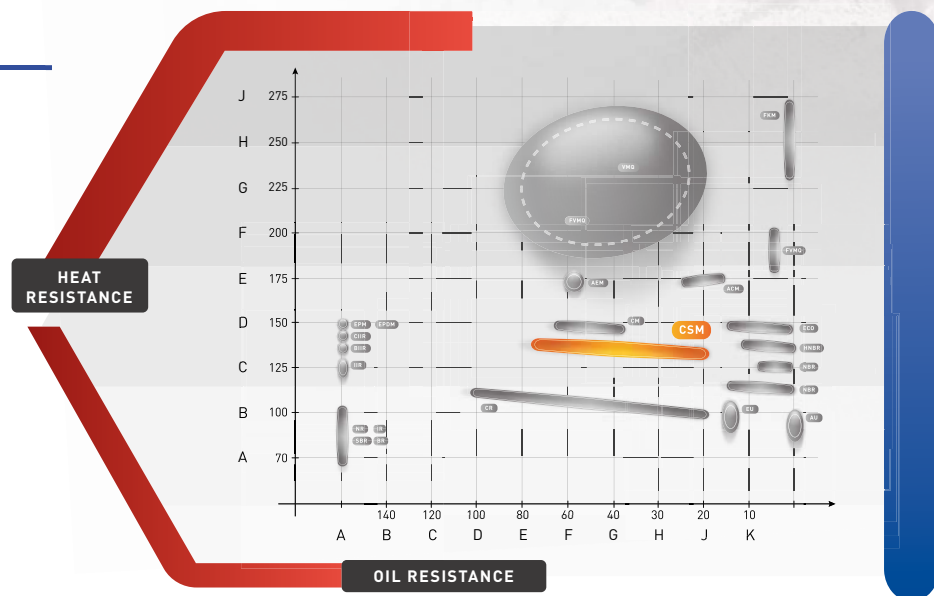
% DI ACRILONITRILE

		28	33	38	45	NBR/PVC
Durezza ShA	pti	55	70	75	75	85
Carico rottura	Mpa	17	18	18	18	18
Allungamento	%	450	320	350	350	200
C. set. 22H@100 °C	%	13	13	15	25	35
Resistenza al calore 72H@100°C						
Carico rottura	%	+5	+5	+5	+1	+10
Allungamento	%	-25	-30	-30	-30	-40
Durezza ShA	pti	+5	+5	+4	+2	+5
IRM 903 70H@120°C						
Carico rottura	%	-30	-20	-10	-5	+6
Allungamento	%	-40	-20	-5	-20	-15
Durezza ShA	pti	-15	-10	-5	-7	-7
Volume	%	+25	+20	+5	+5	+10
Fuel B 48H@40°C						
Carico rottura	%			-40	-30	-25
Allungamento	%			-40	-25	-19
Durezza ShA	pti			-12	-10	-15
Volume	%			+20	+15	+18



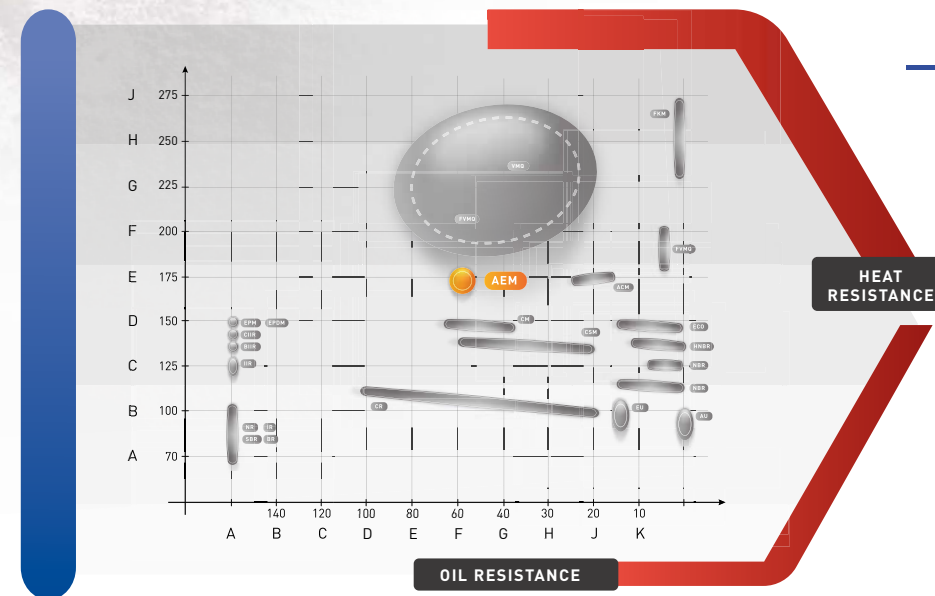
CSM

POLYETHYLENE / CHLOROSULFONATED RUBBER



AEM

ETHYLENE ACRYLIC RUBBER



Classification

The polyethylene-chlorosulfonated, is an elastomer used for a wide series of applications due to its peculiar characteristics:

- good behaviour in a wide range of temperatures (from -40 to +135°C)
- excellent mechanical characteristics
- excellent resistance to ozone and atmospheric agents
- good chemical resistance mainly to oxidative and corrosive agents
- low permeability to humidity and other gases
- good flame resistance
- good dielectric characteristics

Polymer type

CSM is formed by the chlorosulfonation of polyethylene. The crystalline polyethylene is made amorphous through the introduction of chlorine in varying quantity from 25 to 45%. The vulcanization, obtainable with different curing systems, is provided by the presence of chloro-sulphonyl groups or through the

reaction with the alkyl chloride structure. Different polymer grades characterized by a variable chlorine content are available. Mechanical characteristics, Compression Set, Chemical and low temperature resistance are influenced by the content of chlorine.

Applications

The applications concern the most common industrial sectors as for instance Automotive, Appliances, house building, cables, roll covering.

The most common manufactured articles are:

- hoses for the transport of inorganic aggressive chemical solutions
- cable jacketing
- waterproof membranes for roofs, reservoirs, basins
- conveyor belts
- coloured profiles for the house building (high colour stability)
- coated fabrics

Classification

These special elastomers, introduced by Dupont in 1975, constitute an interesting combination of high and low temperatures resistances, with good behaviour against the oils and refrigerant liquids, acids and inorganic bases, atmospheric agents.

Polymer type

Ethylene-acrylic elastomers are produced by polymerization of ethylene and methyl acrylate with small quantities of monomers containing carboxylic groups classified as "cure-site." This particularity allows to get efficient vulcanization with the employment of diamine and other accelerators sensitive to the carboxylic groups. Such elastomers exhibit good physical and mechanical characteristics by using common reinforcing fillers.

The ethylene structure confers good properties at low temperatures while the methyl acrylate provides the resistance against oils. The completely saturated

structure guarantees elevated resistance against weathering, ozone and UV radiation.

In addition there are grades available with higher acrylate content and improved oil resistance.

Applications

AEM base compounds are suitable for the production of articles with hardness ranging from 50 to 80 ShA. Tailor made compounds are possible according to various specifications and technologies used (molding, extrusion, calendaring, rubber/textile adhesion and rubber/metal bonding). Technical articles produced with AEM compounds are employed in the automotive sector, chemical and electric fields and wherever a good behaviour is required at high and low temperatures, in basic and acid environment, resistance to the ozone and outdoor, good electric properties.

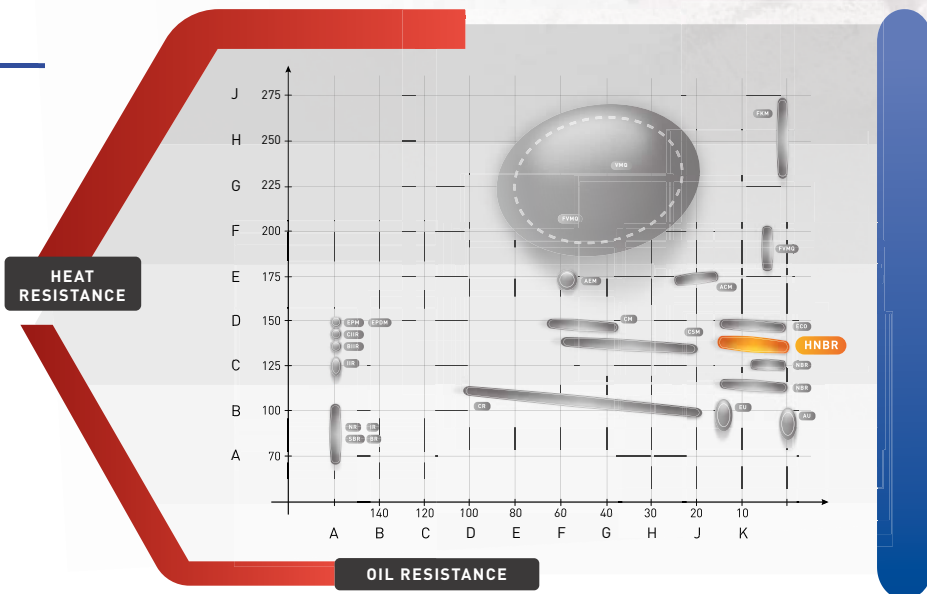
Contenuto di Cl	%	40	25
Durezza ShA	pti	70	70
Carico rottura	Mpa	22	15
Allungamento	%	250	180
Lacerazione	Kg/cm	30	20
c. set 22H@70°C	%	25	30
Resistenza al calore 7gg@121°C			
Carico rottura	%	-25	+20
Allungamento	%	-20	-60
Durezza ShA	pti	+10	+15
ASTM N.3 70H@100°C			
Volume	%	+12	+60

Durezza ShA	pti	50	60
Carico rottura	Mpa	15	10
Allungamento	%	500	400
C. set 70H@150°C	%	20	30
Resistenza al calore 7gg@150°C			
Carico rottura	%	+10	-10
Allungamento	%	-20	-40
Durezza ShA	pti	+5	+15
IRM 901 70H@150°C			
Volume	%	+5	+5
IRM 903 70H@150°C			
Volume	%	+50	+55
Brittle point	°C	-35	-60



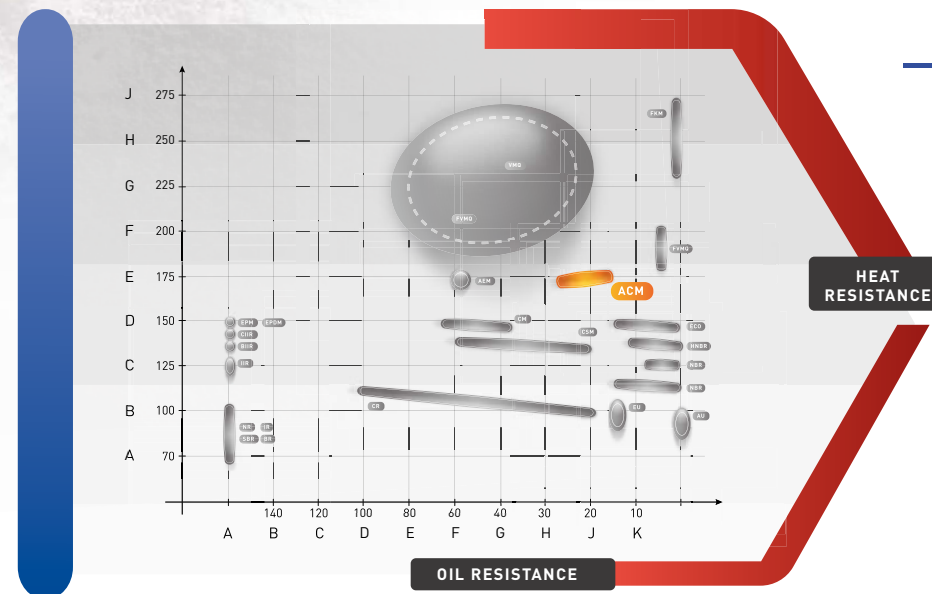
HNBR

HYDROGENATED NITRILE RUBBERS



ACM

ACRYLIC RUBBERS



Classification

Hydrogenated nitrile elastomer compounds allow to get items with peculiar and interesting properties like:

- excellent mechanical characteristics
- high tensile strength and tear resistance and excellent abrasion resistance
- good heat resistance (up to 150°C) elasticity at low temperatures
- good ozone and weathering resistance
- good compression set
- excellent lubricating oils resistance mainly with amine additives
- good resistance to liquids and lubricants for the cooling circuits

Polymer type

Hydrogenated nitrile rubbers derive from standard NBR on which a hydrogenation of the double residual bond of the butadiene is effected. As NBR therefore they are available with different acrylonitrile content (17% - 49%) while they have

been differentiating from NBR by the insaturation degree. The choice essentially depends on the oil resistance and the low temperatures characteristics.

Applications

The interesting characteristics of these elastomers allow their employment in the most varied application fields, where high mechanical properties and oil resistance are required. The most common fields are:

- oil drilling
- static and dynamic gaskets for engine components for brake circuits and for air conditioned
- cables - components for pumps - transmission belts - shaft seals - gaskets for gas plant

Classification

Polyacrylic elastomers represent a class of polymeric material/s with elevated performances in terms of:

- resistance to the heat, working temperature up to 150°C
- high lubricating oils resistance
- good sealing characteristics, low values of compression set at high temperatures
- excellent ozone resistance
- good electric characteristics

Polymer type

Polymers available on the market are typical for oil resistance and low temperature performance. Inside these two classes there is a further differentiation according to the "N-cure-site" present in the polymeric chain. The two principal families are substantially composed from an homopolymer of the ethyl acrylate and a copolymer ethyl and butyl acrylate. They differentiate for the low temperature resistance. This characteristic can be sometimes improved

with the addition of special monomers. As for other elastomers, when polyacrylic rubbers improve their low temperature performances they show a worsening of oil resistance.

Applications

The applications mainly concern the automotive sector and the oil drilling as:

- O-rings
- engine gaskets (cylinder and oil pan)
- shaft seals
- valve cover gaskets
- oil filter gaskets
- pipes
- spark plug boots

		% ACN	
		45	35
Insaturazione		Alta	Alta
Durezza ShA	Pti	70	70
Carico rottura	Mpa	22	22
Allungamento	%	260	290
Compression set ASTM_D-395/B 70h@150°C	%	20	20
Aria 70h@150°C			
Durezza ShA	Pti	+5	+2
Carico rottura	%	+5	+5
Allungamento	%	-5	-10
Fluido B, 70h@40°C			
Durezza ShA	Pti	-15	-15
Carico rottura	%	-30	-40
Allungamento	%	-20	-25
Volume	%	+25	+30
IRM 903 70h@150°C			
Durezza ShA	Pti	-5	-10
Carico rottura	%	+10	+10
Allungamento	%	+10	+15
Volume	%	+5	15

		OMOPOLIMERO	COPOLIMERO	COPOLIMERO BASSA TEMPERATURA
Durezza ShA	pti	60	60	65
Carico rottura	Mpa	13	11	9
Allungamento	%	220	200	180
C. set 70h@150°C	%	15	18	20
Resistenza al calore 70h@150°C				
Carico rottura	%	-15	-20	-20
Allungamento	%	-30	-35	-35
Durezza ShA	pti	+9	+8	+8
IRM 903 70h@150°C				
Durezza ShA	pti	-8	-9	-9
Volume	%	+12	+25	+30
Brittle point	°C	-15	-25	-35



EURORUBBER COMPOUNDS

The **quality** of **EURORUBBER compounds** is a direct consequence of the know-how developed in the R&D centre comprehensive of chemical-physical laboratory equipped with most advanced analysis techniques: Thermal Analysis (TGA, DSC, DMA), Infrared Spectroscopy (FT-IR), Gas Chromatography-Mass Spectrometry (GC/MS).

All the production lines are equipped with technologies and tools that guarantee, with high standards of quality consistency, the compliance of **compound and production with severe technical specifications**. Eurorubber production site is certified according to **UNI EN ISO 9001 and ISO 14001**.



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