TECHNICAL DATA SHEET

FLEXIMIUM MAG

FLEXIMIUM

1. DESCRIPTION OF PRODUCTS AND FIELDS OF APPLICATION

Rubber-Neodymium is an advanced magnetic material that combines the high performance of **neodymium (NdFeB)** magnets with the versatility and processability of polymers. This is a class of **composite magnets**, in which neodymium powder is dispersed within a plastic or elastomeric matrix, allowing the production of magnets with complex geometries and specific characteristics.

Thanks to its **combination of magnetic performance and production flexibility**, **Rubber-Neodymium** represents an innovative solution for high-performance applications that require customized geometries and superior mechanical strength. It is used in numerous industrial sectors, including:

1. Electric and brushless motors – weight reduction and better energy efficiency.
2. Magnetic sensors and encoders – multi-pole magnetization with high precision.
3. Automotive industry – usage in compact actuators, servo mechanisms and magnetic components.
4. Medical devices – biocompatible materials for healthcare applications.
5. Magnetic fastening tools – flexible magnets for industrial and commercial applications.

MyP Magnetica Italiana's **Rubber-Neodymium FLEXIMIUM** is made of high-quality materials, ensuring **reliable and long-lasting performance**.

COMPONENT	%
$Nd_2Fe_{14}B$	88-92
Copolymer - Butadiene Acrylonitrile (NBR) Polymer - Chlorinated Polyethylene (CPE)	8-12
Other Additives	<0,5

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2. TECHNICAL SPECIFICATIONS OF FLEXIMIUM MATERIALS

Magnetic properties (at 20 °C)

Product	Metodo Analitico	Br **		BHc		JHc		BHmax	
		G	mT	Oe	KA/m	Oe	KA/m	MGOe	KJ/m³
Fleximium 1 Fleximium 1I	IO ML01	2700 3300	270 330	1800 2400	143 191	2600 4000	207 318	1,5 2,5	12 20
Fleximium 2	IO ML01	3300	330 390	2400 2800	191 223	4000 6000	318 478	2,5 3,5	20 28
Fleximium 2I		3900							
Fleximium 3	IO ML01	3900	390 480	2600 3400	207 270	6000 9000	478 717	3,5 4,5	28 36
Fleximium 3I		4800							
Fleximium 5	IO ML01	4800	480	3700 4700	290 380	8000 10000	630 800	5,5 6,5	44 52
Fleximium 5I		5700							
Fleximium 7	IO ML01	5700	570 670	4500 5500	350 440	8500 11000	670 880	7,5 8,5	60 68
Fleximium 7I		6700							

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Physical Properties (at 20 °C)

The experience gained in many years of activity has allowed MyP Magnetica Italiana s.r.l. to optimize different recipes to meet the multiple requests of the customer for the parameters of Hardness and Elasticity. More specific requests can be agreed with the Sales Department of MyP Magnetica Italiana s.r.l.

Product	Shore Hardness**			Elasticity		
	Analytical Method	*D*	Thickness (mm)	2	5	8
Fleximium	***IO ML05***	**30** 50	***IO ML09***	**≥ 150**	**≥ 130**	**≥ 130**

Product	Temperature Coefficient			Thermal Expansion Coefficient	Maximum Operating Temperature (1)	Specific Weight (± 0.2%)
	Analytical Method	*Δ Br/ ΔT (%/ °C)*	*Δ JHc/ ΔT (%/ °C)*	*(°C $^{-1}$)*	*(°C)*	*g/cm³*
Fleximium 1 **Fleximium 1I**	*IO ML13*	=- 0.2	=+ 0.45	10.5 x 10^{-6}	50 *(60)* *100(120)*	3.6
Fleximium 2 **Fleximium 2I**	*IO ML13*	=- 0.2	=+ 0.45	10.5 x 10^{-6}	50 *(60)* *100(120)*	4.0
Fleximium 3 **Fleximium 3I**	*IO ML13*	=- 0.2	=+ 0.45	10.5 x 10^{-6}	50 *(60)* *100(120)*	4,5
Fleximium 5 **Fleximium 5I**	*IO ML13*	=- 0.2	=+ 0.45	10.5 x 10^{-6}	50 *(60)* *100(120)*	5
Fleximium 7 **Fleximium 7I**	*IO ML13*	=- 0.2	=+ 0.45	10.5 x 10^{-6}	50 *(60)* *100(120)*	5.5

(1) The values in brackets are to be understood as maximum operating temperatures for short periods in order to avoid loss of flexibility. Once the maximum declared temperatures are exceeded, the bachelization process begins, i.e. the hardening and loss of elasticity of the rubber present inside the mixture. Loss of flexibility does not impair magnetic values.

TECHNICAL DATA SHEET

FLEXIMIUM MAG

3. HANDLING

FLEXIMIUM is an advanced magnetic material that combines the high potency of neodymium with the flexibility of polymers. It is designed to offer **excellent machinability and mechanical strength**, making it less brittle than sintered magnets.

- **It does not contain hazardous substances** such as phthalates or heavy metals in significant quantities.
- **It is non-flammable**, thanks to its polymer and magnetic composition.
- **It offers greater impact and fracture resistance** than ceramic or sintered magnets.
- **It has good corrosion resistance**, but in particularly humid or aggressive environments it may require additional protective coatings.
- **Complies with REACH (EC Regulation 1907/2006), CLP (EC Regulation 1272/2008) and RoHS regulations**, relating to the restriction of the use of hazardous substances in electrical and electronic equipment.

Precautions for use

1. **Handle with care** to avoid shocks that could compromise its integrity, especially in thinner formats.
2. **Avoid contact with aggressive solvents** or industrial oils, which could degrade the polymer matrix.
3. **Beware of magnetic force**: **FLEXIMIUM** magnets can generate strong attractions, causing crushing or interference with sensitive electronic devices.

For further details, MyP Magnetica Italiana S.r.l. refers to the consultation of the **FLEXIMIUM Safety Data Sheet**.

4. STORAGE

FLEXIMIUM is characterized by **good environmental stability**, but to ensure a long service life and keep its magnetic properties unaltered, we recommend to:

- **Avoid contact with aggressive chemical solvents** (greases, organic solvents, industrial oils), which could alter the plastic matrix.
- **Protect against excessive impact and pressure**, especially in the case of thin magnets or magnets with complex geometries.
- **Keep the magnets separated with spacers**, especially if they are very strong, to avoid sudden attractions that could cause damage or difficulty in handling.
- **Store FLEXIMIUM in a dry**, temperature-controlled environment of **20°C (± 5°C),** avoiding prolonged exposure to high humidity that could affect the mechanical properties of the material.

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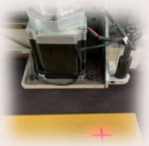
FLEXIMIUM MAG

5. SHAPES AND SIZES

MyP Magnetica Italiana has the most advanced technologies for cutting magnetic rubber, which allow us to create any type of shape and create unique and innovative solutions.

The cutting options for **FLEXIMIUM** materials are:

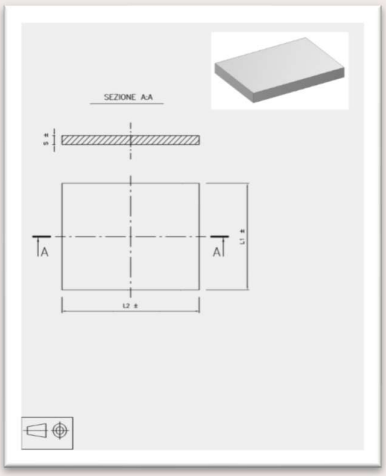
- ✓ **Standard**
- ✓ **Premium**
- ✓ **Plus**

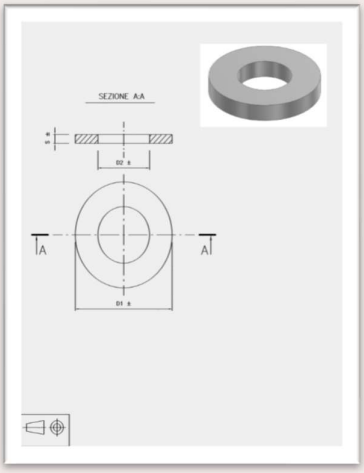


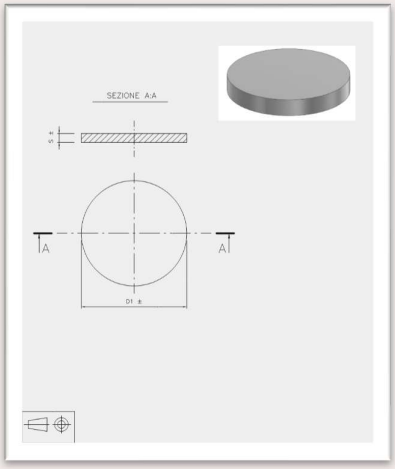
Each with increasing levels of accuracy and customization to meet bespoke dimensional specifications.

The standard shapes are: strips, rings, and rods.

a. TOLLERANZE DIMENSIONALI **







STRIPS

DESCRIPTION			
	S [mm]	L1 [mm]	L2 [mm]
MIN. VALUE	**0,80**	**4,00**	**4,00**
MAX. VALUE	8,00	450,00	1.500,00
Cut - STANDARD	S [mm]	L1 <300 [mm]	L2 <300 [mm]
TOLERANCES + -	0,15	0,50	0,50

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Cut - STANDARD	S [mm]	L1 300-450 [mm]	L2 300-500 [mm]
TOLERANCES + -	0,15	1,00	1,00
Cut - STANDARD	**S [mm]**	**L1 300-450 [mm]**	**L2 >501 [mm]**
TOLERANCES + -	0,15	1,00	3,00
Cut - PREMIUM	**S <5mm [mm]**	**L1 <400 [mm]**	**L2 <400 [mm]**
TOLERANCES + -	0,15	0,20	0,20
Cut - PLUS	**S [mm]**	**L1 <400 [mm]**	**L2 <400 [mm]**
TOLERANCES + -	0,15	0,10	0,10

RINGS - RODS

DESCRIPTION			
	S [mm]	D1 [mm]	D2 [mm]
MIN. VALUE	0,80	8,00	4,00
MAX. VALUE	8,00	440,00	420,00
Cut - STANDARD	**S [mm]**	**D1 [mm]**	**D2 [mm]**
TOLERANCES + -	0,15	0,30	0,30
Cut - PREMIUM	**S <5mm [mm]**	**D1 [mm]**	**D2 [mm]**
TOLERANCES + -	0,15	0,20	0,20
Cut - PLUS	**S [mm]**	**D1 [mm]**	**D2 [mm]**
TOLERANCES + -	0,10	0,10	0,10

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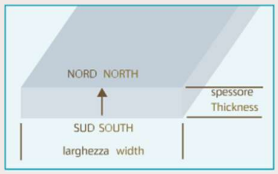
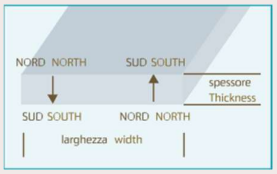
6. MAGNETIZATION

FLEXIMIUM can be magnetized in different ways:

AXIAL

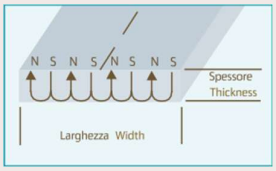


TWO POLES



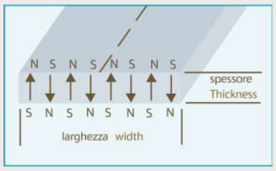
These are types of magnetization used to obtain small magnets for sensors and in any case when the force of attraction is not relevant.

MULTIPOLE ON ONE SIDE



PP2: polar pitch 2mm
PP3: polar pitch 3mm
PP5: polar pitch 5mm
PP7: polar pitch 7mm

MULTIPOLE ON BOTH SIDES



PP7: polar pitch 7mm

These are types of magnetization used to obtain magnets, normally large in size, when the force of attraction is the predominant factor.

Multipole magnetization is a method by which several alternating magnetic poles (a succession of N-S-N-S poles...) are created on the same side of a magnet.
The arrangement of the poles is not random: it follows a regular repetition called the polar pitch.
The pole pitch is the distance between two poles of equal polarity (e.g. from one North pole to the next North pole).

MULTIPOLE MAGNETIZATION ON ONE SIDE is the type of magnetization that gives greater adhesive force. The least magnetized surface is normally marked.

Iron plate for support

The magnetic force resulting from the **MULTIPOLE MAGNETIZATION ON ONE SIDE** can be significantly increased by applying an iron plate with a thickness of about 0,5 to 1mm mm on a surface of the magnet, as can be deduced from the sealing diagrams illustrated below. The iron plate is applied to the least magnetized surface.

Product	ATTRACTION FORCE											
	Polar Pitch 7- Thickness 1,2mm				Polar Pitch 7- Thickness 2mm				Polar Pitch 7- Thickness 3,2mm			
	G	*N/cm²*	*g/cm²*	*kg/m²*	*G*	*N/cm³*	*g/cm³*	*kg/m²*	*G*	*N/cm³*	*g/cm³*	*kg/m²*
Fleximium 7	1250	1,9	195	1950	1500	2,5	255	255	2550	3,5	350	3500
Fleximium 7 with 0,5mm Fe plate									3200	4,0	4000	4000

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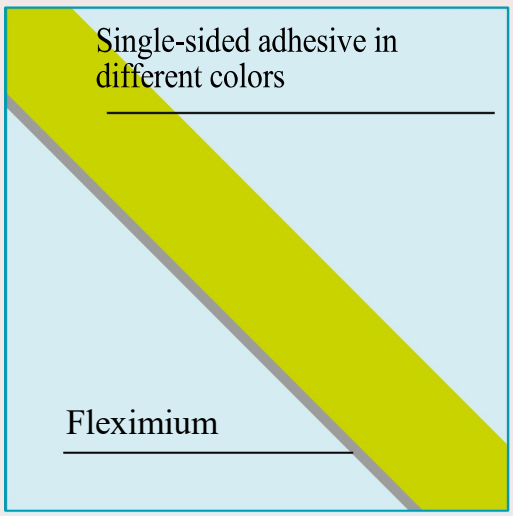
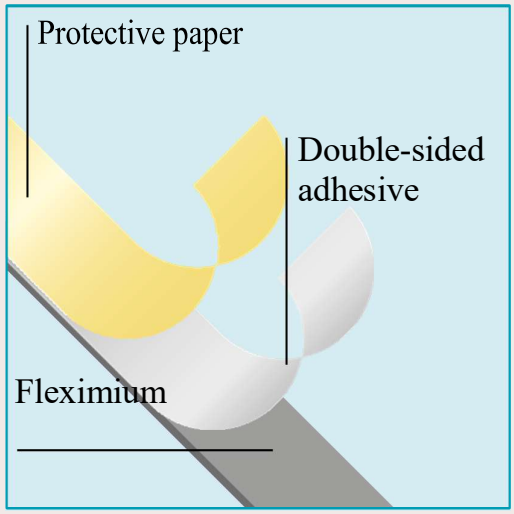
7. CUSTOMIZATION

FLEXIMIUM magnets can be customized by varnishing one or more surfaces, or by applying colored single-sided adhesive tape or with a double-sided adhesive surface..





The adhesives we use are highly resistant to ageing, light and temperatures from -20°C to +100°C. It is customary for MyP Magnetica Italiana to use double-sided adhesives from the best brands on the market, whose names are indicated during the offer phase.

8. CUSTOMER CARE

For anything not directly reported in this Technical Data Sheet, MyP Magnetica Italiana s.r.l. makes its Commercial and Technical Offices available to advise you on the material that best suits your needs and to support new projects and/or requests.

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*The values of the parameters reported and marked with ** are guaranteed and certified by MyP Magnetica Italiana s.r.l.. Additional values can be supplied, guaranteed and certified only, and exclusively, subject to agreement with the Commercial Office of MyP Magnetica Italiana s.r.l..*

Note: what is reported in this sheet is the result of direct observations and practical experiences. However, since it is not possible to have and keep under control all the conditions and all the operating parameters at the user's premises, MyP Magnetica Italiana s.r.l. does not assume responsibility for the improper use of such information.