



TECHNICAL DATA SHEET

MySC

SAMARIUM-COBALT MAGNETS

1. DESCRIPTION OF PRODUCTS AND FIELDS OF APPLICATION

MySC is the range of **Samarium Cobalt (SmCo)** magnets by **MyP Magnetica Italiana**, developed and designed for applications that require **high magnetic performance, excellent thermal stability and corrosion resistance**.

These magnets belong to the **rare earth** family, offering a unique combination of **high coercivity, residual induction, and resistance to aggressive environments**, making them ideal for extreme operating conditions.

MySC magnets are available into two main classes:

- **SmCo₅ (1:5)** – Offers high magnetization with ease of processing and magnetization.
- **Sm₂Co₁₇ (2:17)** – Provides superior coercivity, with increased resistance to demagnetization and higher operating temperatures.

Thanks to their **advanced features**, **MySC Samarium Cobalt magnets** are particularly suitable for applications where **long-term magnetic stability** and **resistance to high temperatures** are essential.

Advantages of Samarium Cobalt Magnets (MySC)

- ✓ **Excellent thermal stability**: they operate without significant losses up to **250-350°C** and can reach maximum operating temperatures of up to **500-550°C** (depending on quality).
- ✓ **High resistance to demagnetization**: thanks to their **high coercivity (Hc)**, they resist opposing magnetic fields without undergoing alterations.
- ✓ **Good corrosion resistance**: unlike Neodymium, they do not need protective coatings in standard environments.
- ✓ **High magnetic energy (BHmax)**: superior to ferrite and comparable to Neodymium, with a stable magnetic field over time.
- ✓ **Low magnetic variation with temperature**: ideal for applications where stability is critical.
- ✓ **Available in different geometries**: they can be produced in complex shapes to meet specific customer requirements.

Applications of MySC Magnets

Thanks to their **advanced magnetic properties**, **MySC Samarium Cobalt magnets** are used in a wide range of industrial and technological sectors, including:

- **Automotive & Motorsport**: sensori di posizione, motori elettrici ad alte prestazioni, attuatori.
- **Aerospace & Military**: guidance systems, radars, generators and defense devices.
- **Electromedical Industry**: medical imaging, brushless motors for medical equipment.
- **Industrial Automation**: magnetic brakes, magnetic couplings, magnetic guides.
- **High Performance Motors & Generators**: electric motors for extreme applications, magnetic turbines.
- **Instrumentation & Sensors**: magnetic sensors, position and speed detectors, reed switches.
- **Energy Industry**: wind generators, motors for high temperature environments.
- **Audio & Acoustics Sector**: precision loudspeakers and microphones.

MyP Magnetica Italiana's MySC magnets are made from high-quality materials, ensuring **reliable and long-lasting performance**.



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CHEMICAL COMPOSITION		%
SmCo ₅	Sm ₂ Co ₁₇	88-98
Other Additives		2-12

The additives present in the alloy are designed to optimize magnetic and mechanical properties, improving resistance to demagnetization, high temperatures and corrosion.

2. TECHNICAL SPECIFICATIONS OF MySC MATERIALS

Magnetic properties (at 20 °C)

Product SmCo ₅	Br **		HcB		HcJ		BHmax	
	G	mT	Oe	kA/m	KOe	kA/m	MGOe	kJ/m ³
MySC XG16	7700	770	7200	573	>	20	1592	119
	8600	860	8400	668			18	143
MySC XG18	8200	820	7800	621	>	20	1592	135
	9000	900	8800	700			20	159
MySC XG20	8600	860	8200	653	>	20	1592	143
	9200	920	9000	716			21	167
MySC XG22	9000	900	8500	676	>	20	1592	159
	9500	950	9300	740		0	23	183
MySC XG24	9500	950	9000	716	>	20	1592	175
	10000	1000	9800	780			24	191
MySC XG25	>9700	>970	9200	732	>	20	1592	183
							25	199



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Product Sm ₂ Co ₁₇	Br **		HcB		HcJ		BHmax		
	G	mT	Oe	kA/m	KOe		kA/m	MGOe	kJ/m ³
MySC XGS20L	8600	860	4500	358		5	398	18	143
	9200	920	8800	700		18	1432	22	175
MySC XGS20	8600	860	7800	621		18	1432	18	143
	9200	920	8800	700		25	1989	22	175
MySC XGS20H	8600	860	7800	621	>	25	1989	18	143
	9200	920	8800	700				22	175
MySC XG22L	9000	900	4500	358		5	398	20	159
	9500	950	9200	732		18	1432	24	191
MySC XG22	9000	900	8200	653		18	1432	20	159
	9500	950	9200	732		25	1989	24	191
MySC XGS22H	9000	900	8200	653	>	25	1989	20	159
	9500	950	9200	732				24	191
MySC XG24L	9500	950	4500	358		5	398	22	175
	10000	1000	9700	772		18	1432	26	207
MySC XG24	9500	950	8600	684		18	1432	22	175
	10000	1000	9700	772		25	1989	26	207
MySC XGS24H	9500	950	8600	684	>	25	1989	22	175
	10000	1000	9700	772				26	207
MySC XGS26L	10000	1000	4500	358		5	398	24	191
	10400	1040	10000	796		18	1432	27	215
MySC XG26	10000	1000	9000	716		18	1432	24	191
	10400	1040	10000	796		25	1989	27	215
MySC XGS26H	10000	1000	9000	716	>	25	1989	24	191
	10400	1040	10000	796				27	215
MySC XGS28L	10400	1040	4500	358		5	398	26	207
	10800	1080	10500	836		18	1432	28	223
MySC XGS28	10400	1040	9500	756		18	1432	26	207
	10800	1080	10500	836		25	1989	28	223
MySC XGS28H	10400	1040	9500	756	>	25	1989	26	207
	10800	1080	10500	836				28	223
MySC XGS30L	10800	1080	4500	358		5	398	28	223



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	11100	1110	10600	844		18	1432	30	239
MySC XGS30	10800	1080	9800	780		18	1432	28	223
	11100	1110	10600	844		25	1989	30	239
MySC XGS30H	10800	1080	9800	780	>	25	1989	28	223
	11100	1110	10600	844				30	239
MySC XGS32L	11100	1110	4500	358		5	398	30	239
	11400	1140	10800	859		18	1432	32	255
MySC XGS32	11100	1110	10100	804		18	1432	30	239
	11400	1140	10800	859		25	1989	32	255
MySC XGS32H	11100	1110	10100	804	>	25	1989	30	239
	11400	1140	10800	859				32	255
MySC XGS33L	11300	1130	4500	358		5	398	31	247
	11500	1150	11000	875		18	1432	33	263
MySC XGS33	11300	1130	10400	828		18	1432	31	247
	11500	1150	11000	875		25	1989	33	263
MySC XGS33H	11300	1130	10400	828	>	25	1989	31	247
	11500	1150	11000	875				33	263
MySC XGS34L	11400	1140	4500	358		5	398	32	255
	11700	1170	11200	891		18	1432	34	271
MySC XGS34	11400	1140	10600	844		18	1432	32	255
	11700	1170	11200	891		25	1989	34	271
MySC XGS34H	11400	1140	10600	844	>	25	1989	32	255
	11700	1170	11200	891				34	271
MySC XGS35L	11550	1155	4500	358		5	398	33	263
	12000	1200	11200	891		18	1432	35	279
MySC XGS35	11550	1155	10800	859		18	1432	33	263
	12000	1200	11500	915		25	1989	35	279
MySC XGS35H	11550	1155	10800	859	>	25	1989	33	263
	12000	1200	11500	915				35	279
MySC XGS36L	11800	1180	4800	382		5	398	34	271
	12300	1230	11500	915		18	1432	36	286
MySC XGS36	11800	1180	11100	883		18	1432	34	271
	12300	1230	11800	939		25	1989	36	286



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MySC XGS36H	11800	1180	11100	883	>	25	1989	34	271
	12300	1230	11800	939				36	286

Physical Properties (at 20 °C)

Product	MAX Working Temperature	Curie Temperature	α (Br) (20°C-150°C)
	°C	°C	% °C
SmCo ₅	250	700	-0,04
Sm ₂ Co ₁₇	350	800	-0,035

Hardness	Specific Weight ($\pm 0.1\%$)	
Hv	Analytical Method	g/cm ³
450-550	IO ML08	8.2 - 8.6

3. HANDLING

MyP Magnetica Italiana S.r.l.'s **Samarium Cobalt** magnets (**MySC**) are high-performance magnetic materials, characterized by **high thermal stability, resistance to demagnetization and excellent corrosion resistance**.

Key features for handling

- **Excellent resistance to high temperatures** → SmCo magnets can operate in a temperature range of **250°C to 350°C**, up to **500-550°C**, making them ideal for applications in extreme conditions.
- **High coercivity (Hc)** → Compared to AlNiCo, SmCo magnets have a **higher resistance to demagnetization** and maintain their magnetic field even in the presence of opposing fields.
- **Good mechanical strength but inherent brittleness** → Although resistant to high temperatures and corrosion, Samarium Cobalt magnets **are brittle** and can chip or break when subjected to violent impact or excessive mechanical stress.
- **Excellent corrosion resistance** → Do not require **protective coatings** in most applications, unlike Neodymium magnets.
- **Compliance with safety regulations** → **MySC** magnets comply with **REACH (EC Regulation 1907/2006)** and **RoHS (Directive 2011/65/EU and subsequent updates)** regulations relating to the restriction of the use of hazardous substances.

Precautions for use

- **Handle with care to avoid breakage:** SmCo magnets are **more fragile than Neodymium and AlNiCo**; therefore, it is essential to avoid excessive shocks and mechanical stress.
- **Avoid mechanical stress and direct contact with hard surfaces**, especially for thin or geometrically complex formats.
- **Use protective gloves** if necessary, especially for large magnets, to prevent accidental crushing due to their strong magnetic attraction.

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- **Do not subject magnets to sudden thermal shocks:** the sudden transition from high to low temperatures can compromise the structural stability of the magnet.
- **Avoid exposure to very strong external magnetic fields** that could alter the magnetization.

For further details, MyP Magnetica Italiana S.r.l. refers to the relevant **Safety Data Sheet for Samarium Cobalt Magnets (MySC)**.

4. STORAGE

MySC Samarium Cobalt magnets are highly stable, but to ensure their **long life and optimal efficiency**, proper storage procedures **must be followed**.

- **Protection against demagnetization** → Due to their **high coercivity**, SmCo magnets **do not demagnetize easily**, but it is still recommended **to avoid exposure to strong opposing magnetic fields** for long periods.
- **Avoid shocks and mechanical stress** → Despite having a stable structure, SmCo magnets **are fragile** and can chip or break in the event of strong impacts.
- **Maintain a controlled temperature** → SmCo magnets can withstand high temperatures of up to **500-550°C**, but to avoid **excessive thermal expansion**, it is advisable **to store them in environments with temperatures below 250°C when not in use**.
- **Store separately with spacers** → When storing multiple SmCo magnets, it is recommended to **separate them with spacers** to prevent unwanted magnetic attraction and accidental damage.
- **Optional surface protection** → Although SmCo magnets **are naturally resistant to corrosion**, in environments with high exposure to **moisture, harsh chemicals, or salt spray**, protective coatings **can be applied** to increase their durability.

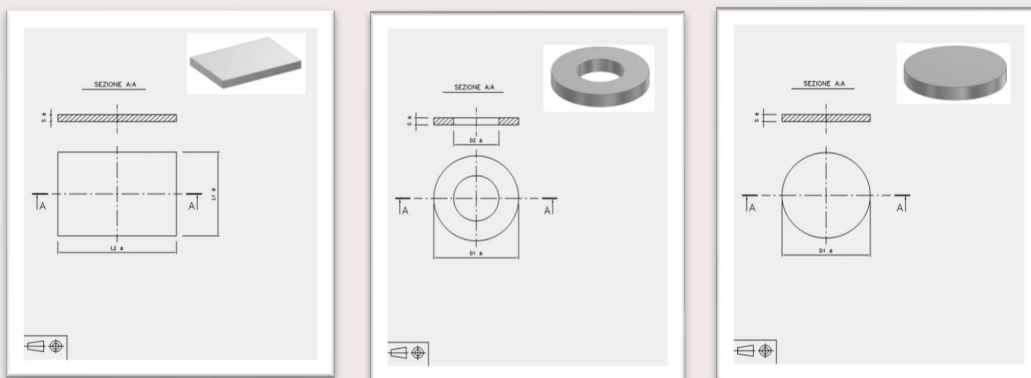
By following these guidelines, you will ensure a **long life and maximum efficiency** of Samarium Cobalt **MySC** magnets.

5. SHAPES AND SIZES

Thanks to the **melting and sintering processes**, SmCo magnets can be **made into complex and tailor-made shapes**.

The standard shapes are: parallelepipeds, rings, rods.

DIMENSIONAL TOLERANCES **





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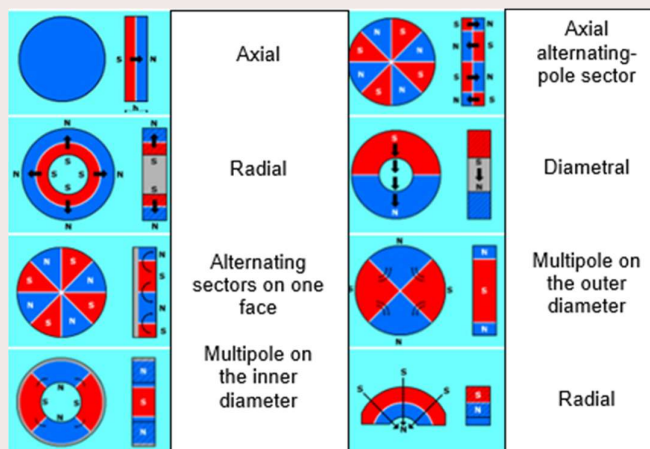
DESCRIPTION			
	S [mm]	D1 [mm]	D2 [mm]
TOLERANCES + -	0,15	0,10	0,10

Thanks to our partnership with a Chinese manufacturer, MyP Magnetica Italiana is able to supply SmCo magnets of all types of shapes and sizes..

6. MAGNETIZATION

MySC Samarium Cobalt magnets can be **magnetized in different configurations** depending on the application and their geometry. Thanks to their **high coercivity (Hc)** and **thermal stability**, they offer intense and long-lasting magnetization that is resistant to opposing magnetic fields and extreme temperatures.

MySC magnets are exclusively available in **an anisotropic** version, with a preferential orientation of the magnetization determined during the production process. This allows us to obtain a **high and stable magnetic field strength over time**.



AXIAL MAGNETIZATION

Description: The magnetic field is oriented along the main axis of the magnet (from the top to the bottom side).

Applications: Electric motors, generators, actuators, precision sensors, aerospace and defense devices.



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DIAMETRAL MAGNETIZATION

Description: The magnetic field is oriented along the diameter of the magnet, with the poles located on opposite sides.

Applications: Circular magnets for **stepper motors, magnetic couplings and non-contact transmissions**.

MULTIPOLAR MAGNETIZATION ON FLAT SURFACE

Description: Magnetization takes place on a flat surface with several alternating magnetic poles (North and South).

Applications: Measuring instruments, magnetic encoders, magnetic rollers and industrial automation guides.

MULTIPOLAR MAGNETIZATION ON CYLINDRICAL SURFACE

Description: Magnetization is distributed alternately along the circumference of a cylinder.

Applications: Mainly used in **brushless motors, magnetic encoders and precision generators**.

RADIAL MAGNETIZATION

Description: The magnetic field develops from the center outwards or vice versa along the radius of the magnet.

Applications: Magnetic rings for **synchronous motors, high-performance magnetic couplings, and aerospace applications**.

CUSTOM MAGNETIZATION

Description: Some magnets can be magnetized with custom patterns for specific needs, such as unique magnetic codes or complex magnetic field orientations.

Applications: High-precision encoders, navigation instruments, advanced sensors and biomedical applications.

7. CUSTOMIZATION

MySC Samarium Cobalt magnets can be **customized** to suit a wide range of industrial and technological applications. Thanks to their **thermal resistance, magnetic stability, and anti-corrosion properties**, you can apply finishes and surface treatments to improve their durability and performance.

Surface Finishes and Special Coatings

Unlike Neodymium, **MySC** magnets do **not require protective coatings** in most applications. However, for particular operating conditions, they can be treated to improve durability.

Optional treatments available:

- **Protective varnishes** → Improve aesthetics and provide additional protection in chemically aggressive environments.
- **Lacquers and resin coatings** → Prevent the release of metal particles and improve chemical resistance.
- **Teflon or epoxy coatings** → Advanced protection against solvents and corrosive environments.



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- **Sandblasted or polished surfaces** → Improve surface quality and coupling with other materials.
- **Special colorings** → For identification or aesthetic needs, with adhesive films or surface treatments.

Double-sided adhesive surfaces

For ease of installation and mounting, **MySC** magnets can be supplied with **high-strength double-sided adhesives** already applied to the surface.

Characteristics of the adhesives used:

- ✓ **High resistance to ageing**, light and weathering.
- ✓ **Adesione efficace** su diversi materiali (metallo, plastica, vetro, legno).
- ✓ **Thermal resistance** from **-20°C to +100°C**, with options up to **+150°C** for special applications.
- ✓ **Availability of premium stickers** from the best brands, with specific details provided at the offer stage.

Thanks to these **customization options**, **MySC** magnets can be optimized for industrial, electronic, medical, and design applications.

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.