

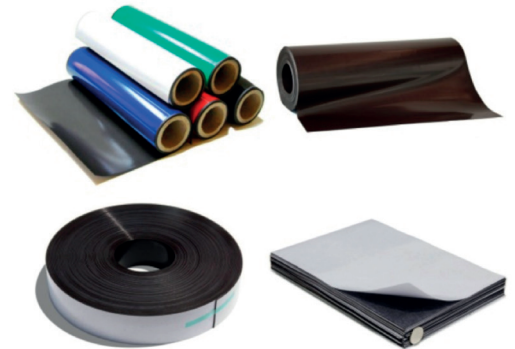
## ANISOFLEX™ FLEXIBLE RUBBER MAGNET

### General Information

Flexible rubber magnets have physical properties that allow them to be used in a variety of ways that would not be possible with more brittle magnets. Flexible magnetic materials can be coiled, twisted, or cut into shapes without any loss of magnetic capability.

The flexibility and ease of machining of these materials permit design innovations and automated manufacturing techniques. They offer product designers a uniquely desirable combination of properties at lower cost than other magnetic materials.

Flexible magnets are used in many applications including small motors, position/angle sensors, advertising signs, magnetic filtering, posters and signs etc. These are available in rolls, tapes, A3 or A4 size, plain brown or self-adhesive material, cut and scored to length, or made to your exact specifications. The nature of the material makes it possible to achieve very tight tolerances.



### Typical Physical Properties

Anisotropic Magnetic Sheet is made from a different powder grade compared to the usual Isotropic (Iso) type and generally has a Maximum Energy Product of 1.0 to 1.5 MGOe and undergoes a slightly different manufacturing process to ensure alignment of the magnetic particles. Anisotropic flexible magnetic sheet comes into its own when stuck to a mild steel sheet of at least equal thickness which prevents any flux leakage and focuses all of the magnetic force on the working face.

Tensile Strength (kg/cm <sup>3</sup> )	20 < f < 100
Elongation (%)	60 < l < 300
Hardness (Hv)	95 ± 5
Density (g/cm <sup>3</sup> )	3.70 ± 0.2
Saturation Field Strength	10 KOe, 800 KA/m
Flexibility	No crack when twisting around a testing bar diameter 20-60mm
Twist	No crack at twist with 180° twice

### Material Information

- Made by consolidating Strontium or Barium ferrite powder with polymer matrix.
- Form in profiles, strips and sheets by extrusion / calendaring method.
- Product can be stamped, slit, punched and laminated.
- Good demagnetization resistance & reasonable resistance to chemical agents.
- Material is readily available and low in cost.
- BHmax = 1 to 1.5 MGOe.
- Can be multipole magnetized freely.
- Working temperature from -40 degree to 100 degree.
- Good flexible properties.
- Good stability and reliability, which has been proven by systemic testing.
- Available in thicknesses from 0.5 to 5.0mm.
- Available in widths upto 700mm & Length as desired.
- Available in various shapes — Long & narrow strips, large area thin sheets, rolls, tapes, rings etc.
- Available in choice of backing : self-adhesive, plain.
- Available in choice of color—Vinyl coated.
- 3M self-adhesive tape 9471 or 9448 is normally used. Other models of 3M may be used upon request. Other adhesives may be used upon request.

Supreme Aniso flexible magnets are made by binding strontium ferrite magnet into a flexible thermo-plastic binder which is then calendered into sheet or extruded into strip form. Any colour can be achieved by laminating the material. Colour faced sheet is laminated with a PVC film on the non-magnetic face. When using 1.5mm Anisotropic Sheet on 1.5mm Mild Steel, the pull strength will be more than 40% greater than that of 1.5mm Isotropic Sheet.



Supreme Anisoflex is a versatile flexible rubber magnet material that may be used for an unimaginable variety of applications, including display advertisements, micro-motors, sensors, speakers, gaskets, novelties, signages and many more. Further features include;

- In sheet, roll and strip form.
- Can be cut or shaped easily.
- Silk screening or digital printing techniques can be used in imprinting sheet materials laminated with vinyl or those with adhesive backed sides.
- Adheres to products easily.

## MAGNET FLUX DISTRIBUTION

Multipolar on a single surface, the Lifton Anisoflex™ is made by applying the Halbach array to eliminate the effective surface gauss on one surface and multiplying the effective gauss on the other surface in an alternating array of N-S-N-S-N etc.

## Magnetic Properties of Flexible Rubber Magnets

Material	Isotropic / Anisotropic	Remanence		Coercivity		Intrinsic Coercivity		Max Energy Product	
		Br (mT)	Br (Gs)	bHc (kA/m)	bHc (Oe)	iHC (kA/m)	iHc (Oe)	(BH) <sub>max</sub> (kJ/m <sup>3</sup> )	(BH) <sub>max</sub> (MGOe)
Flex-7L	Isotropic	165 ± 10	1650 ± 100	108 ± 8	1350 ± 100	132 ± 8	1650 ± 100	5.2 ± 0.4	0.65 ± 0.05
Flex-7H	Isotropic	170 ± 10	1700 ± 100	112 ± 8	1400 ± 100	136 ± 8	1700 ± 100	5.6 ± 0.4	0.70 ± 0.05
Flex-10	Semi-aniso	220 ± 5	2200 ± 50	136 ± 8	1700 ± 100	160 ± 8	2000 ± 100	8.0 ± 0.4	1.0 ± 0.5
Flex-12	Anisotropic	245 ± 5	2450 ± 50	140 ± 8	1750 ± 100	148 ± 8	1850 ± 100	11.2 ± 0.4	1.40 ± 0.05
Flex-12BH	Anisotropic	247.5 ± 2.5	2475 ± 25	168 ± 8	2100 ± 100	224 ± 8	2800 ± 100	12.0 ± 0.4	1.50 ± 0.05

## Binder and Coating Selection of Flexible Rubber Magnets

Binder Type	Description
CPE	Most common and economical material with good fabrication properties
NBR	Good resistance to organic solvents such as thinners and petroleum.

Coating Type	Description
PVC	Suitable for various kind of printing methods
Self-Adhesive Tape	Available in pressure sensitive or foam-backing

## Other Physical & Magnetic Properties of Lifton Anisoflex™ Rubber Magnets

Material	Units	Aniso Flex
Temperature Coefficient of Br	%/°C	-0.18
Max Operating Temperature	°C	100
Heat-Resistance	(100°C/72h)	***
Cold-Resistance	(-40°C/72h)	***
Wet-Resistance	(60°C*90%RH/72h)	***
Motor-Oil Resistance	(23°C/72h)	***
Cold-Heat-Impact Resistance	(-40~85°C*0.5h*5/Cycle)	**
Density(g/cm <sup>3</sup> )		3.6~3.8
Hardness(Shore D, ASTM)		40~65
Elongation Rate (% , JIS K6301)		50
Tensile Strength(Mpa, JIS K6301)		6.9
Temperature Range (°C)		-40 °C ~ 100°C
Surface Flux Density (Max. Gauss on Surface)		400 to 1000
Attractive Force (g/cm <sup>2</sup> ) depending on thickness		30-100 (0.5 to 2.0mm T)

## NEOFLEX™ FLEXIBLE RUBBER MAGNET

Lifton Neoflex rubber magnet is a type of flexible permanent magnet material with ultra high power, whose performance is far superior compared to the standard Ferrite Isotropic, the slightly improved Anisotropic Ferrite rubber magnet material or even the Samarium Nitrogen flexible magnet. The NeoFlex is made by mixing Neodymium magnet powders with synthetic or natural rubber binders and subsequently rolling (calendaring) or extrusion. Lifton Neoflex is a versatile flexible rubber magnet material that may be used for an unimaginable variety of applications, including display advertisements, micro-motors, sensors, speakers, gaskets, novelties, signages and many more. These can be manipulated in sheet and strip form and can be cut or shaped easily. The R5 grade of NeoFlex rubber magnet is on offer at the E-store Mall from Lifton Magnets.

- Higher energy flexible materials may sometimes replace Ceramic 1 materials
- Adheres to products easily
- Silk screening or digital printing techniques can be used in imprinting sheet materials laminated with vinyl

### Magnet Flux Distribution

Multipolar on a single surface, the Lifton Neoflex is made by applying the Halbach array to eliminate the effective surface gauss on one surface and multiplying the effective gauss on the other surface in an alternating array of N-S-N-S-N etc.

### General Characteristics

- BHmax = 80KJ/m<sup>3</sup> (3.0 to 10.0 MGO).
- Can be multipole magnetized freely.
- Working temperature from -40 degree to 120 degree.

### Material Information

- Good flexible properties.
- Good stability and reliability, which has been proven by systemic testing.
- Available in thicknesses from 0.5 to 3.0mm.
- Available in widths upto 200mm & Length as desired.
- Available in various shapes — Long & narrow bars, large area thin sheets, rings etc.
- Available in choice of backing : self-adhesive, plain.
- Available in choice of color—Vinyl coated.
- 3M self-adhesive tape 9471 or 9448 is normally used. Other models of 3M may be used upon request.
- Other adhesives may be used upon request.



### Applications

- For unusually strong adhesive power requirements.
- Great holding force in a small footprint.

Measurement Parameter	NeoFlex™
Tensile Strength (Mpa)	3.8 (JIS K6301)
Elongation Rate (%)	55 (JIS K6301)
Hardness (Shore D)	30 (ASTM)
Volume Resistivity (Ω . M)	4.75 x 10 <sup>16</sup> (JIS K7194)
Heat Resistance (Deg C)	-40 to +120 (depending on Grade)
Max Gauss (Surface Flux Density) G	750 (0.5mm) / 1240 (1.0mm)
Attractive Force (g/cm <sup>2</sup> )	70 (0.5mm) / 130 (1.0mm)

Material	Units	Neoflex (Grades)					
		R3	R4	R5	R6	R7	RE4
Residual Flux Density (Br)	Gs	3300 ± 500	4300 ± 500	4800 ± 500	5300 ± 500	5800 ± 500	6000 ± 500
	Mt	330 ± 50	430 ± 50	480 ± 50	530 ± 50	580 ± 50	600 ± 50
Coercive Force (Hcb)	Oe	2600 ± 500	3200 ± 500	3700 ± 500	4200 ± 500	4800 ± 500	2200 ± 500
	KA/m	207 ± 40	255 ± 40	295 ± 50	334 ± 50	382 ± 50	179 ± 20
Intrinsic Coercive Force (Hcj)	Oe	5800 ± 1000	7800 ± 1000	8500 ± 1000	9000 ± 1000	9000 ± 1000	2800 ± 500
	KA/m	462±80	621±80	677±80	716±80	716±80	223±40
Maximum (BH Max)	MGOe	3 ± 0.5	4 ± 0.5	5 ± 0.5	6 ± 0.5	7 ± 0.5	4 ± 0.5
	KJ/m <sup>3</sup>	24 ± 4	32 ± 4	40 ± 4	48 ± 4	56 ± 4	32 ± 4
Flux Irreversible Loss	%	<5					
Temperature Coefficient of Br	%/°C	-0.11					-0.17
Max Operating Temperature	°C	80	80	80	80	80	120
Heat-Resistance	(100°C/72h)	**	**	**	**	**	***
Cold-Resistance	(-40°C/72h)	***	***	***	***	***	***
Wet-Resistance	(60°C*90%RH/72h)	**	**	**	**	**	**
Motor-Oil Resistance	(23°C/72h)	**	**	**	**	**	**
Cold-Heat-Impact Resistance	(-40~85°C*0.5h*5/Cycle)	**	**	**	**	**	**
Density(g/cm <sup>3</sup> )				4.8~5.5	4.8~5.5	5.0~5.6	
Hardness(Shore D, ASTM)		40~80					
Elongation Rate (% , JIS K6301)		55					
Tensile Strength(Mpa, JIS K6301)		3.8					
Temperature Range (°C)		-40 °C ~ 120°C					
Surface Flux Density (Max. Gauss on Surface)		1200 to 1550					
Attractive Force (g/cm <sup>2</sup> ) depending on thickness		100-250 (0.5 to 2.0mm)					