

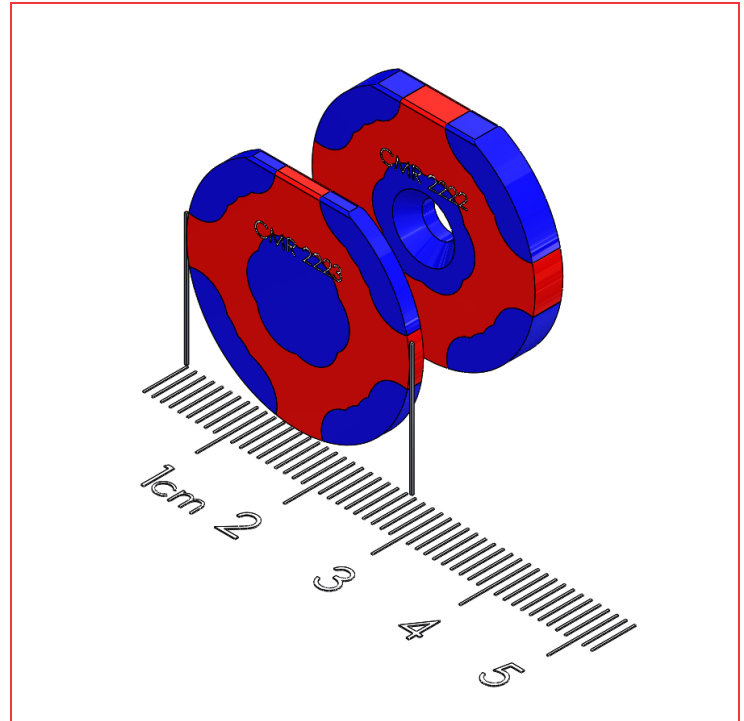
www.polymagnet.com

## 1002294 Detent Polymagnet pair - 4 Position (90 degree)

Portrait/Landscape Polymagnets are engineered to provide a stronger attachment force as well as a unique 90° rotational alignment force over conventional magnets. Conventional magnets typically do not align with any level of precision when attaching to each other. However, these Polymagnets are designed to provide a high holding force when aligned and very little attractive force when out of alignment, which allows the user to rotate the device easily between locking positions. As these magnets approach alignment they provide a positive force toward the alignment position. These Polymagnets also exhibit a tightly controlled magnetic field which minimizes interference with sensitive devices.

### Features and Benefits

- Rotational Alignment for mobile phone case/stand connections
- Compass friendly
- Centering
- #6 countersink
- 1002222 D-shape 1" OD 1/8" thick
- 1002223 D-shape 1" OD 1/16" thick



### Technical Specifications:

Shape Type:	D-Shape	
Diameter:	1.00"	(25.4 mm)
Weight:	0.05 oz	(1.4 g)
Material:	NdFeB	
Magnet Grade:	N50	
Coating:	Ni-Cu-Ni	
Temperature Rating:	140° F	(60 C)
Holding Force:	14.9 lbs	(66.6 N)
Torque:	16.9 oz-in	(120mN*m)

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The Portrait/Landscape Polymagnets provide superior rotational alignment attributes compared to conventional magnets over their working range. These Polymagnets demonstrate a strong attract force while in alignment, 0°, 90°, 180°, and 270°, and a weak attract force once rotated out of alignment. While aligned, in any of the aforementioned positions, the Polymagnet pair is at a maximum force of 15.0 lbs. While keeping one magnet constrained, the attract force reaches a minimum of 7.7 lbs as the other magnet is rotated +/- 45°. As the rotation continues past 45° the attraction force increases in the direction of rotation until it reaches the maximum force in the 90° position. When the Polymagnets are offset, torque exists toward the position with a higher attractive force. The torque peaks at 17.0 oz-in.

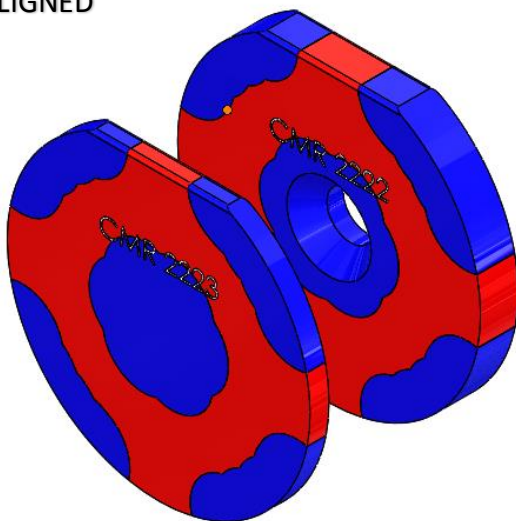
These magnets can be used to align and attach components or accessories. Because of their alignment attributes these magnets can be used to transfer a rotational force across a gap. The alignment force as a function of axial rotation can be seen in the graph below at a separation distance of 1.5mm.

\*In the images below, north poles are indicated by the red regions, south poles are indicated by the blue regions, and steel is indicated by the grey region.

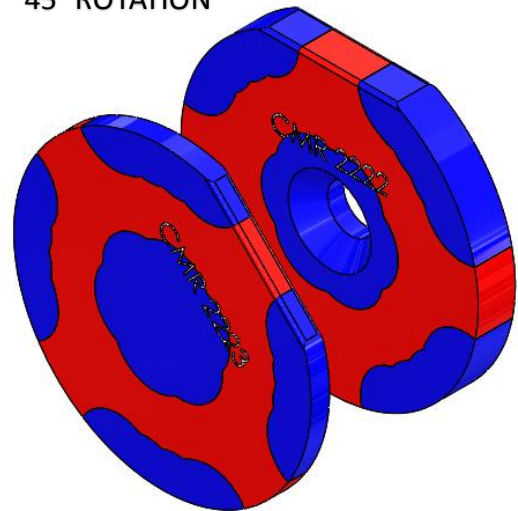
Attract Force:	15.0 lbs
Torque:	0 oz-in

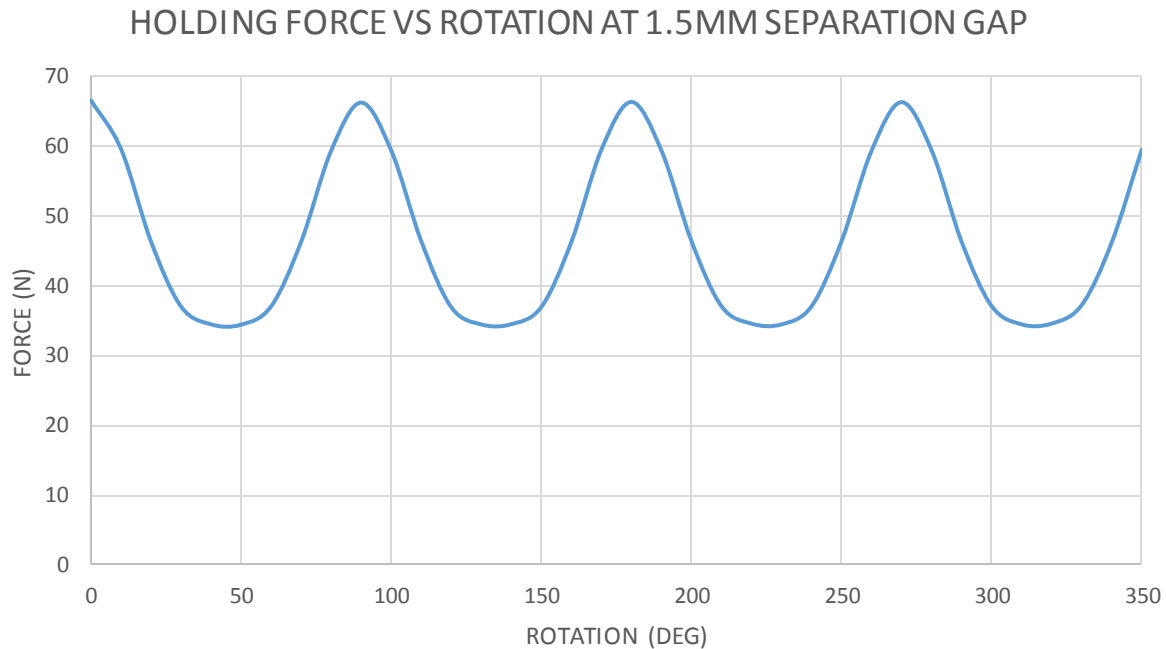
Attract Force:	7.7 lbs
Torque:	17.0 oz-in

ALIGNED



45° ROTATION

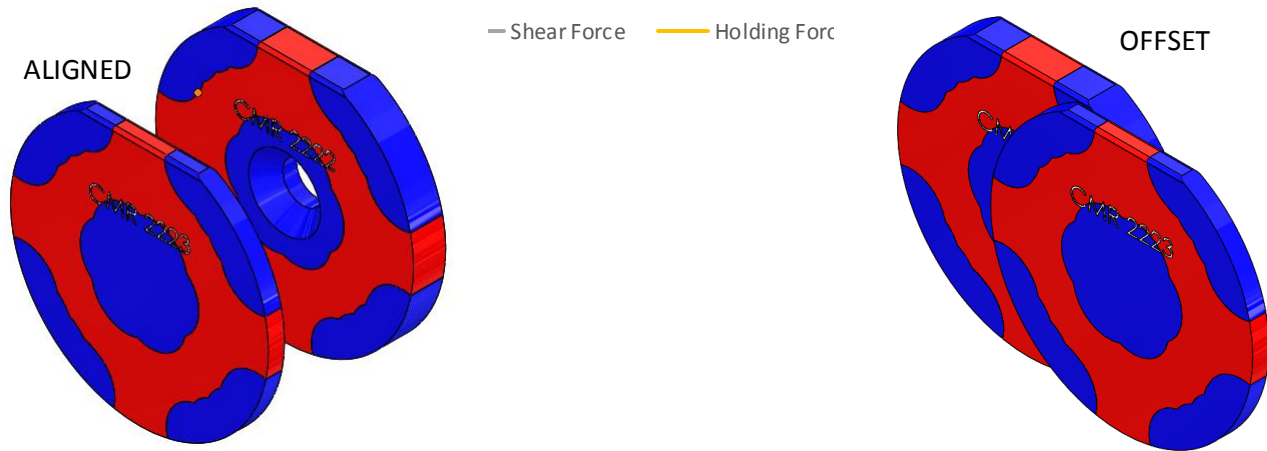
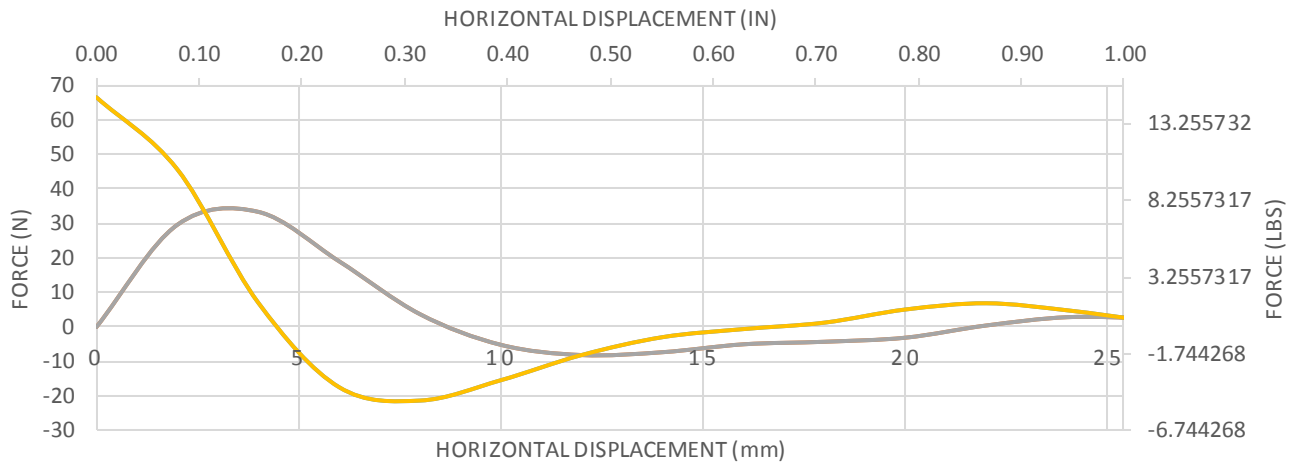




These Polymagnets are D-shaped which provide an indexing feature. This aids in the assembly process as well as provides a flat surface which resist torque as the magnets are rotated. It is recommended to use a material with a high coefficient of friction on one of the surfaces. This will increase the mechanical shear force of the system.

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### HOLDING FORCE VS HORIZONTAL DISPLACEMENT SHORT AXIS AT 1.5MM MAGNET TO MAGNET GAP



These Polymagnets also provide a self-centering force as the magnet is moved away from the center position. Once the magnet is moved off center the attractive force decreases and the shear force increases, pulling the magnet back towards the center position. This decrease in attractive force minimizes friction and allows self-alignment of the system.

#### Notes on Performance Data

The performance information provided in this data sheet is derived from test or simulation results of directly comparable magnets of the same size and grade under consistent conditions. The magnets are tested under controlled environmental conditions. Unconstrained application testing may give lower forces due to the magnet tilting or shifting away from target during engagement and disengagement.

#### Patent Information

Pat. [www.cmrpatents.com](http://www.cmrpatents.com)

