

BRUNSON INSTRUMENT COMPANY



SMR Target Holders & Accessories Catalog



HELPING THE WORLD MEASURE™
ISO 9001:2008 CERTIFIED

Oct. 2012

The Metrology Professional's Choice



Target holder kits



Invar scaling products



Serialized SMR target holders



Heavy duty, portable & custom instrument stands



- **Metrology Accessories:**
 - Instrument stands
 - Calibration instruments
 - Invar calibration products
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 - Photogrammetry targets
 - Custom targeting artifacts

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HELPING THE WORLD MEASURE™



ISO 9001:2008 Certified



For Alignment:
Optical Tooling, accessories,
repair & calibration



Who knew Target Holders should be certified?



Studies have shown that up to 25% of target holders in the field are out of tolerance.



If you think about it, it only makes sense. You spent thousands of dollars on laser measurement systems that are certified annually. Your 3D metrology software has been evaluated and certified. Operators stay current on measurement techniques and procedures.

So why is the least expensive component in your process lacking certification documentation?

Find out how Brunson certified target holders save our customers time and money.

In-house certification can be costly and time-consuming. Not certifying your target holders can reduce system accuracy.

If your clients require audits of your 3D metrology tools, talk to Brunson about how our dimensionally documented products are saving our customers time, money and worry over metrology systems certification.



sales@brunson.us

Brunson Certified Measurement Products

- Online access to certification documents
- Dimensionally certified using NIST-traceable processes
- Serial numbered to your specifications
- Trade-In allowance for your used target holders

For more information, visit: www.Brunson.us/who-knew

Only Brunson offers Certified target holders

100% factory inspected - Critical Dimensions Recorded



Benefits of Certified target holders include:

- 100% Factory inspection of all critical dimensions
- Reduce uncertainty by knowing as-delivered critical dimensions to $\pm 0.0025\text{mm}$ ($\pm 0.0001''$)
- Verified by a NIST-traceable certificate of accuracy
- Each target holder is serialized
- More confidence in your measurements



Make sure your Target Holders are **CERTIFIED!** Look for the symbol!

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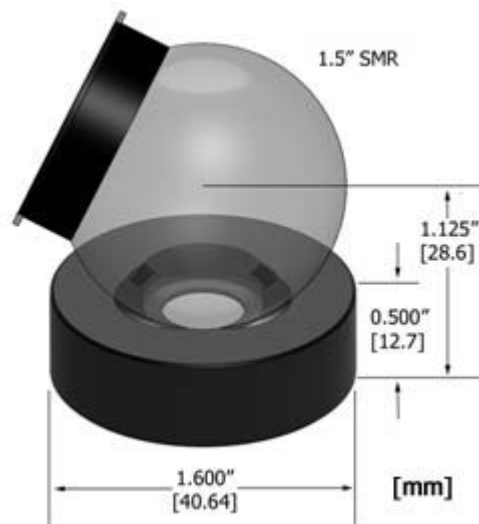




1.5THDN Drift Nest

Put temporary targets on just about anything

The **1.5THDN**, or drift nest (sometimes called a "hockey puck"), provides a temporary, magnetic SMR adapter in almost any location and on almost any surface. The back of this adapter is flat. Note that the magnet holds the SMR in place but does not hold the adapter in its location. Use any general adhesive (we often use a hot glue gun) to attach these adapters temporarily to machine tools, concrete floors and pillars, posts, stands, or just about anything else that is available. When you're finished, remove the adapter and you're on your way to your next assignment. Works with a 1.5" diameter SMR. You may wish to look at similar product 1.5THEDN, our "economy" drift nest.



Specifications

Adapter size: 1.600" (40.6mm) diameter by 0.5" (12.7mm) high

Material: Aluminum

Distance to Center of SMR: Approx. 1.125" (28.6mm) above base of the adapter

Finish: Hard anodized (black)

May be used with...

- Any 1.5" diameter SMR



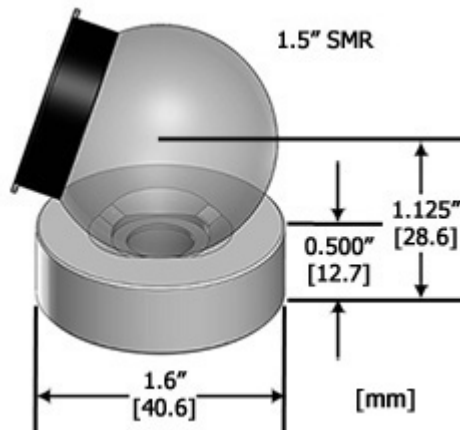
1.5THEDN "Economy" Drift Nest

Put temporary targets on just about anything

The **1.5THEDN** is our economy drift nest - a less expensive alternative to the 1.5THDN. It provides a temporary, magnetic SMR adapter in almost any location and on almost any surface. The back of this adapter is flat. Note that the magnet holds the SMR in place but does not hold the adapter in its location. Use any general adhesive (e.g., a hot glue gun) to attach these adapters temporarily to machine tools, concrete floors and pillars, posts, stands, or just about anything else that is available. When you're finished, remove the adapter and you're on your way to your next assignment. The 1.5THEDN is different from its classier big brother in that it has no anodized finish.



Works with a 1.5" diameter SMR.



Specifications

Adapter size: 1.6" (40.6mm) diameter by 0.5" (12.7mm) high

Material: Aluminum

Distance to Center of SMR: Approx. 1.125" (28.6mm) above base of the adapter

Finish: None

May be used with...

- Any 1.5" diameter SMR

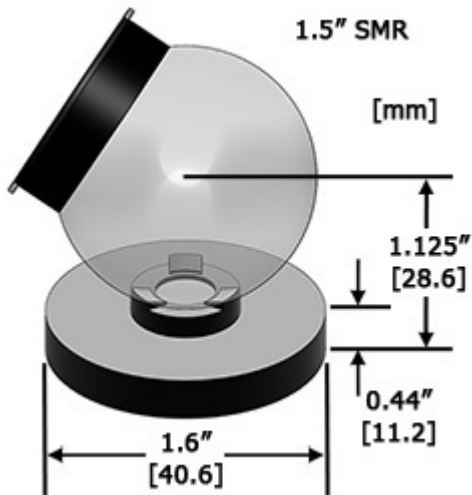


1.5THNDN "Negative" Drift Nest

For the down-low all the way around

The **1.5THNDN** is a drift nest with a negative viewing angle all the way around. It will allow you to tip the SMR down to achieve a viewing angle as low as -21° . The 1.5THNDN provides axial rotation of the SMR through 360° .

The drift nest (sometimes called a "hockey puck"), provides a temporary, magnetic SMR adapter in almost any location and on almost any surface. The back of this adapter is flat. The magnet is intended to hold the SMR in place but does not hold the adapter in its location.



Use any general adhesive (we often use a hot glue gun) to attach these adapters temporarily to machine tools, concrete floors and pillars, posts, stands, or just about anything else that is available. To aid in removal, use a flat bladed screwdriver in the pry slot provided on the bottom. Works with a 1.5" diameter SMR. You may wish to look at our other drift nests, 1.5THDN or the 1.5THEDN.

Specifications

Adapter size: Main body is 1.6" (40.6mm) diameter by 0.44" (11.2mm) thick

Material: Aluminum

Finish: Hard anodized (black)

Distance to Center of SMR: Approx. 1.125" above base of the adapter

May be used with...

- Any 1.5" diameter SMR

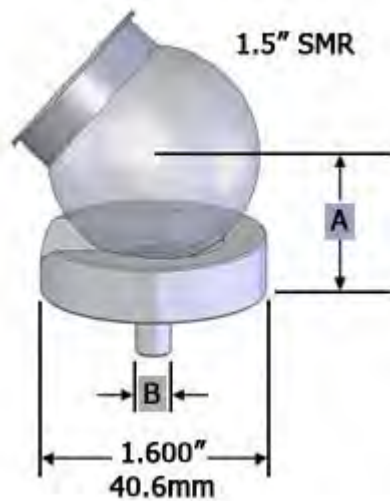


1.5TH Series SMR Adapters



For use with 1.5" SMR

The **1.5TH Series** magnetic adapters provide an SMR nest which mounts in holes having a diameter of 1/8" - 5/8" or 4mm to 15mm. Shank diameters are held to close tolerances ($-0.0001"$ to $-0.0005"$) for precision slip fits. The adapter holds the centerpoint of a 1.5" diameter SMR 1.000" (or 25mm) above the surface of the part and on centerline of the shank to a tolerance of $\pm 0.0005"$ (0.013mm). The SMR seats on a 3-point conical land and is held in place by a magnet. An optical alley allows the SMR to be rotated down for a lower shooting angle. Construct the desired part number using the information below, or make up your own - we don't have room to show all possible sizes!



Part Number Construction:

1.5TH - A - B

Offset	A
1.000"	1
25 mm	25MM

Choose an "A" value above, and pair with desired "B" value (at right) to create the item number for the product that you want. E.g., 1.5TH-1-.375

Shaft dia.	B	Shaft dia.	B
0.100"	.1	4mm	4MM
1/8"	.125	5mm	5MM
3/16"	.1875	6mm	6MM
1/4"	.25	7mm	7MM
5/16"	.3125	8mm	8MM
3/8"	.375	9mm	9MM
7/16"	.4375	10mm	10MM
1/2"	.5	11mm	11MM
9/16"	.5625	12mm	12MM
5/8"	.625	13mm	13MM
3/4"	.75	14mm	14MM
7/8"	.875	15mm	15MM
1"	1		

Specifications

Adapter dia: 1.6"

Material: Stainless steel

Shank diameter tolerance:
 $-0.0001"$ to $-0.0005"$
 $(-0.003\text{mm to }-0.013\text{mm})$

Offset tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Target centering tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR



1.5THSB Series Diamond Shank Adapters

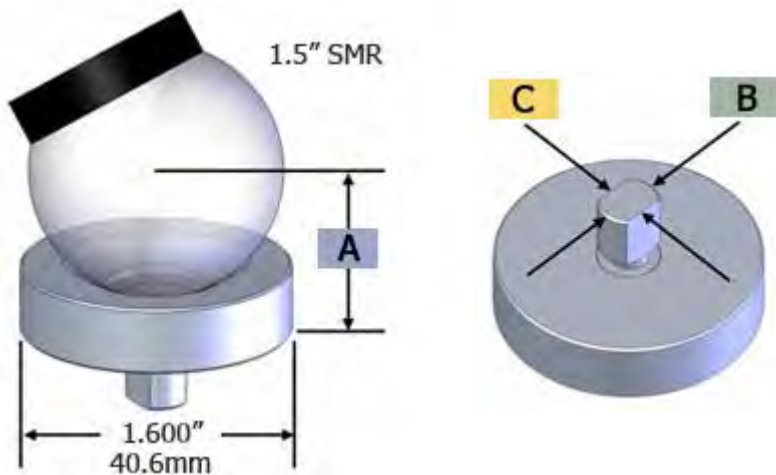


For slotted bushings

The **1.5THSB** "diamond shank" adapter provides an SMR nest for use with slotted bushings found in many fixtures and parts. The cross section of the shank on these adapters is a circle with two flattened sides (see sketch below).

The center of a 1.5" SMR is held precisely 1.000" (English unit version) or 25mm (metric unit version) from the surface of the part. It seats on a 3-point conical land and is held in place firmly by a magnet.

Customers may specify any combination of sizes for shank diameter and flat-to-flat width (see table below).



Part Number Construction

1.5THSB - A - B - C

Offset

A

1.000"

1

25 mm

25MM

Shank dia. "B"

Customer specify, in English or metric units, max dia. 0.625" (15.76mm)

Shank width "C"

Customer specify, in English or metric units

Specifications

Target centering:
±0.0005" (±0.013mm)

Offset tolerance:
±0.0005" (±0.013mm)

Shank diameter tolerance:
-0.0001", -0.0005"
(+0.003mm, -0.013mm)

Flat-to-flat shank width tolerance:
-0.0001", -0.0005"
(+0.003mm, -0.013mm)

Material: Stainless steel

Hardness: HRC 42-45

Construct your desired part number using the legend and table above. Contact us with your specific requirements for shank diameter and flat-to-flat shank width.

May be used with...

- Any 1.5" diameter SMR

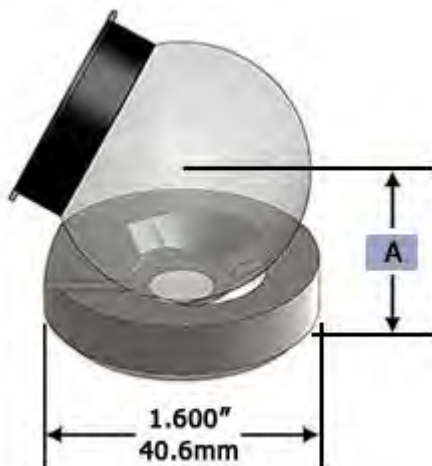


1.5THS Series Corner Adapter



Backed into a corner?

The **1.5THS** magnetic adapter provides an SMR nest which fits into any corner and puts a 1.5" diameter SMR exactly 0.800" away from the rising surface, within ± 0.0005 ". It also holds the centerpoint of the SMR 1.000" (or 25mm for the metric version) ± 0.0005 " above the base surface. A chamfer on the bottom side of this adapter provides a relief for any fillets or various strange things happening at the junction between the surfaces of the object being measured. The SMR seats on a 3-point conical land. An optical alley allows the SMR to be rotated down further for a lower shooting angle. Use the table below to find the item number for the desired target offset.



Offset "A"	Item number
1.000"	1.5THS-1
25mm	1.5THS-25MM

Specifications

Adapter size: 1.6" diameter x 0.404" - 0.420" high (40.64mm dia. x 10.3 - 10.7mm high)

Tolerance, offset dimension "A":
 ± 0.0005 " (0.013mm) above the base surface.

Tolerance, center of SMR to edge of adapter: ± 0.0005 " (0.013mm) away from rising surface.

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR

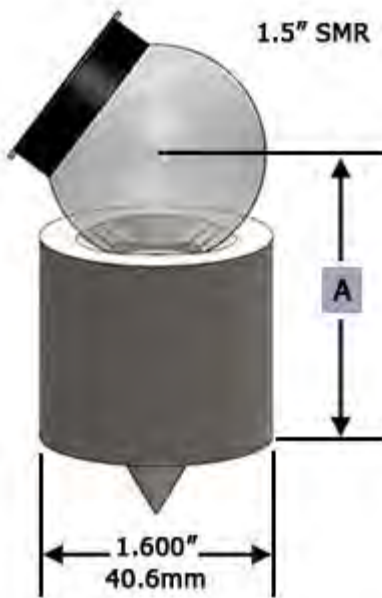


1.5THSC Self-Centering SMR Adapters

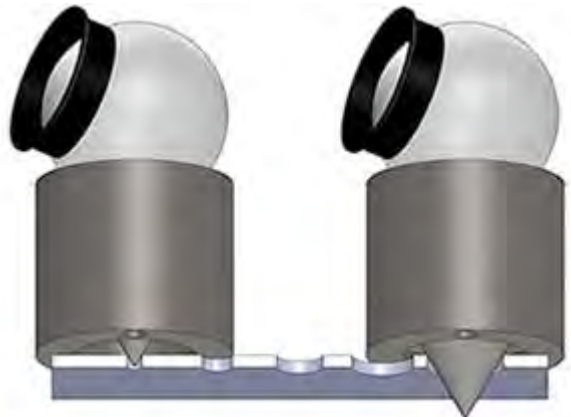


Conical plunger centers itself on multiple diameters

The **1.5THSC** magnetic adapter is used to gather quick data points over a range of hole sizes using a single adapter. The secret? A spring-loaded, cone-shaped, locating plunger (illustration below). This adapter will locate on hole sizes 0.100" to 0.625" (2.5mm to 16mm). Keep in mind that we can also make these adapters to fit other hole diameters on request. Three strong magnets on the bottom keep the adapter squarely on any ferrous surface, and counteract the spring-loaded force of the plunger. The adapter is reliable and repeatable. A knurl around the outer perimeter assists in removal after measuring is finished. The adapter holds the centerpoint of a 1.5" diameter SMR 2.000" (or 50mm for the metric version) above the surface of the part and on centerline of the hole to a tolerance of $\pm 0.0005"$ ($\pm 0.013\text{mm}$). The SMR seats on a 3-point conical land and is held in place by a magnet.



	Model No.	Offset "A"
English	1.5THSC-2	2.000"
Metric	1.5THSC-50MM	50mm



Specifications

Adapter dia: 1.6"

Material: Stainless steel

Fits hole sizes: 0.100" - 0.625" (2.5mm - 16mm)

Offset tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Target centering tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR
- 1.5LK-F Deluxe Lanyard Kit



1.5THE Series Edge Adapter



Pushing it right to the edge?

The **1.5THE** magnetic adapter provides an SMR nest which locates an edge within $\pm 0.0005"$. It also holds the centerpoint of a 1.5" diameter SMR precisely 1.000" or 25mm above the surface of the part being measured. The SMR seats on a 3-point conical land.

Choose the desired model number from the table below, which shows both the English and metric versions of this adapter.



Model	Offset "A"	Tolerance
1.5THE-1	1.000"	$\pm 0.0005"$
1.5THE-25MM	25mm	$\pm 0.013\text{mm}$



Specifications

Adapter size: 1.6" diameter x 0.63" high

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR



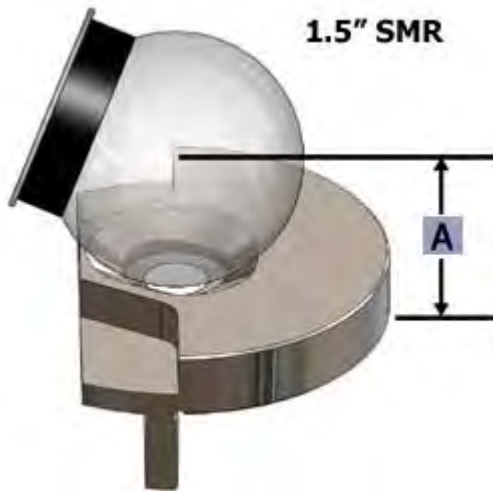
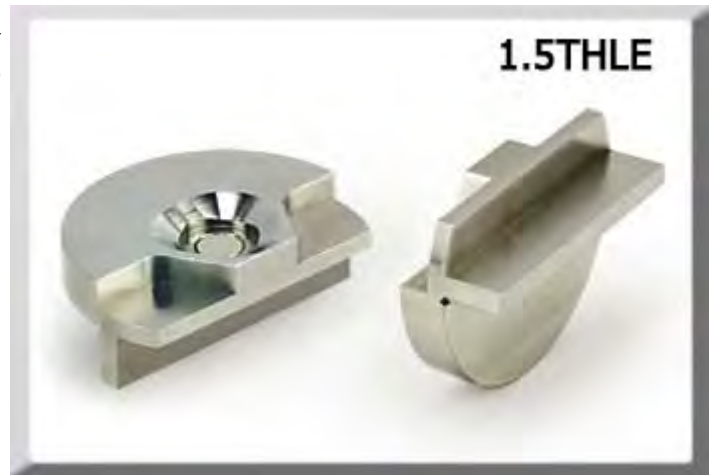
1.5THLE Series Large Edge Adapter



A More Balanced Approach to Edge Detection

The **1.5THLE** magnetic adapter locates a 1.5" diameter SMR directly over an outside corner of two intersecting surfaces within $\pm 0.0005"$. It also holds the centerpoint of the SMR precisely 1.000" or 25mm (depending upon model selected) above the surface of the part being measured. The SMR seats on a 3-point conical land. This adapter is designed for proper balance to allow hands free use.

Choose the desired model number from the table below, which shows both the English and metric versions of this adapter.



Model	Offset "A"	Tolerance
1.5THLE-1	1.000"	$\pm 0.0005"$
1.5THLE-25MM	25mm	$\pm 0.013\text{mm}$

Specifications

Adapter size: 2.5" (63.5mm) diameter

Material: Stainless steel, machine finish

Offset "A" tolerance: $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

Target centering tolerance: ± 0.0005 ($\pm 0.013\text{mm}$)

May be used with...

- Any 1.5" diameter SMR



1.5THF Floor Mount Adapter

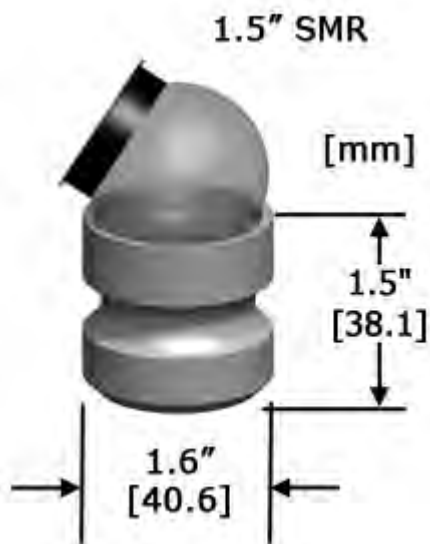
Install permanent monuments in the floor

The **1.5THF** floor target mount provides for a permanent target location in the floor or wall. Following initial installation, it may be surveyed for its final position. This gives you the ability to quickly re-establish coordinate systems in the future by providing known, permanent reference points. They may also be used without an initial survey to provide permanent coordinate system transfer points. Or use them to monitor the movement of foundations over time by checking for deviation from originally mapped coordinates.



The 1.5THF is meant to be grouted or epoxied permanently into holes which have been drilled in concrete floors or walls, so that the top is flush with the surface of the floor or wall. An aggressive knurl around the circumference as well as a large concave groove give this target mount lots of holding power in the surrounding grout. The cap has an O-ring seal to keep the target mount surfaces out of danger and free of debris. The 1.5THF assembly may be attached to a customer-provided positioning jig while being grouting in place, via the M6 threaded hole on top of the lid. In

this way, the 1.5THF can be easily positioned so that the top is flush with the floor or wall, and in the desired position. A flat or straight-bladed screw driver allows easy removal of the lid.



The 1.5" SMR seats on a 3-point conical land and is held firmly in place by a ring magnet.

Specifications

Adapter size: 1.6" (40.6mm) diameter x 1.5" (38.1mm) high

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR



1.5THR-TL Reference Target Mounts

For permanently mounted reference systems

Are you building or adding to a permanently mounted reference system? The **1.5THR-TL** is made exactly for that purpose - establishing permanent target points on jigs, fixtures, tools, and machinery. Use 1/4" bolts through the two counterbored holes in the base to provide secure mounting. Then, two other 15/64th holes act as drill guides for placement of dowels. Once the 1.5THR-TL is bolted down, use a 15/64ths drill through these guide holes into the substrate, ream to 1/4", and insert dowels for a permanent fix on the target's position.



A lid is included to keep out dust and dirt when not in use, held in place by two up-facing magnets on the top face of the nest. The lid overhangs the base slightly to aid in removal. A non-tethered version (one without the beaded chain) of the same product is available by specifying model number **1.5THR**.



Specifications

Mounting holes: 0.266" (6.76mm) diameter, counterbored to 0.438" (11.13mm) dia., 0.250" (6.35mm) deep, on 1.750" (44.45mm) centers

Doweling holes: 0.235" (5.97mm) dia. through, on 1.750" (44.45mm) centers

Lid diameter: 2.250" (57.2mm)

Base and Lid Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR



1.5THT Tripod Mount

For tripod or other temporary base mounting

The **1.5THT** adapter holds a 1.5" diameter SMR and may be mounted on a customer-supplied base unit using one of two different stud sizes, depending upon the model ordered. The bottom side of the 1.5THT contains an internal thread for securing this item to a base unit. Both available models (see table below) have a 5/8"-11 internal thread which fits surveyor's tripods or other instrument adapters. However, the model 1.5THT-.25-20 is supplied with a locking threaded insert to allow the unit to be used with camera tripods or other mounts having a 1/4"-20 thread. A 1/4" hole on the side is provided to assist in removal of the adapter if needed. The SMR seats on a 3-point conical land and is held in place by a nickel-plated Neodymium magnet.



Model	Mounting hole size
1.5THT-.25-20	1/4"-20
1.5THT-.625-11	5/8"-11

Specifications

Adapter size: 1.6" diameter x 1.5" high
(40.64mm dia. x 38.1mm high)

Effective Height (height from base to center of SMR): Approx. 2.07" (52.6mm) above base of the adapter

Material: Stainless steel

May be used with...

- Any 1.5" diameter SMR



1.5THW Weld-on SMR Adapters

Weld-on adapters for permanent fixture use

The **1.5THW** magnetic adapter is meant to be welded permanently in place on any customer fixture. A substantial chamfer around the bottom edge makes for a nicer weld. This item is available in a variety of materials, and is **not** hardened like most of our other adapters. Place it on your fixture in any desired location, add a few weld tacks around the perimeter, and you have a permanent SMR reference. Think of it as a non-drifting drift nest.



The adapter holds the centerpoint of a 1.5" diameter SMR 1" above the surface of the part, although this dimension is not critically controlled because this adapter is simply meant to establish a permanent reference point. The SMR locates on a three-point conical land.

The magnets are provided (one per adapter) but not installed. This is so that you can heat treat the entire fixture after all adapters are welded on (if desired) without affecting the magnetism of the magnets. When ready, the magnets may be installed in the magnet well. We recommend securing the magnets using an adhesive for extra security. Of course, this is mandatory for 1.5THW products constructed from non-magnetic materials. (Hint: don't do this until you are finished with your processing - sometimes they're very hard to get back out!) See our related 1.5THWB, which is the same item with a button base for locating the adapter.

Construct the desired part number using the table below, indicating desired material. Please note that other materials are available upon request.



Part Number Construction:

1.5THW - A

Material	A
6061 Aluminum	6061
7075 Aluminum	7075
1144 Steel	1144
17-4 Stainless	174
303 Stainless	303

Specifications

Adapter dia: 1.6"

Material: See table above.

May be used with...

- Any 1.5" diameter SMR



1.5THWB Series SMR Adapters

Weld-on adapters for permanent fixture use

The **1.5THWB Series** magnetic adapters are meant to be welded permanently in place on any customer fixture. The button base (available in a variety of diameters) gives you an excellent locating reference. A substantial chamfer around the bottom edge makes for a nicer weld. This item is **not** hardened like most of our other adapters, and is available in a variety of materials. Install it on your fixture in a matching size hole, add a few weld tacks around the perimeter, and you have a permanent SMR reference. It's sort of a non-drifting drift nest.



The adapter holds the centerpoint of a 1.5" diameter SMR 1" above the surface of the part, although this dimension is not critically controlled because this weld-on adapter is simply meant to establish a permanent reference point. The SMR locates on a 3-point conical land.

The magnets are provided (one per adapter) but not installed. This is so that you can heat treat the entire fixture after all adapters are welded on (if desired) without affecting the magnetism of the magnets. When ready, the magnets may be installed in the magnet well. We recommend securing the magnets using an adhesive for extra security. Of course, this is mandatory for 1.5THWB products constructed from non-magnetic materials. (Hint: don't do this until you are finished with your processing - sometimes they're very hard to get back out!) See our related 1.5THW, which is the same thing without the button locator.

Construct the desired part number using the table below, indicating desired material "A" and button diameter "B". Please note that other materials and button diameters are available upon request.



Part Number Construction

1.5THWB - A - B

Material	A
6061 Aluminum	6061
7075 Aluminum	7075
1144 Steel	1144
17-4 Stainless	174
303 Stainless	303

Button dia.	B	Button dia.	B
1/4"	.250	5mm	5MM
1/2"	.5	10mm	10MM
3/4"	.75	15mm	15MM
1"	1	20mm	20MM
		25mm	25MM

Specifications

Adapter dia: 1.6"

Material: See table above

Button thickness:
0.250" (6.35mm)

Button dia. tolerance: +0.000",
-0.005" (+0.00mm, -0.13mm)

May be used with...

- Any 1.5" diameter SMR



1.5THCP Series Center Punch

Put a punch mark directly below your SMR location

The **1.5THCP** magnetic adapter is an SMR nest which doubles as a transfer punch locator, allowing you to mark a point directly under the SMR. The magnet in the 1.5THCP is positioned to create a somewhat stronger bond on the bottom than on the top. This offset-magnet approach helps to hold the adapter in place while the SMR is removed and the transfer punch is inserted through the precision center hole. The center hole is true to the center of the SMR within $\pm 0.0005"$ ($\pm 0.013\text{mm}$). An optical alley is provided to allow negative viewing angles, and step edges allow for a better grip. The transfer punch is included.



Choose the desired model number (English or metric version) from the table below.

Model	Offset "A"	Tolerance
1.5THCP-1.15	1.15"	$\pm 0.0005"$
1.5THCP-29MM	29mm	$\pm 0.013\text{mm}$

Specifications

Adapter size: 1.6" (40.6mm) diameter

Material: Stainless steel, machine finish

Offset "A" tolerance: $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

Target centering tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

May be used with...

- Any 1.5" diameter SMR
- Transfer Punch 15344 (included)



1.5THMF SMR Adapter



1.5" Adapter for THMF Floor Mount

The **1.5THMF** adapter is designed to work with the THMF mini floor-mount base, giving you a permanent target location in the floor or wall. Following initial installation of the THMF base unit, this adapter may be installed and surveyed for its actual coordinates using a 1.5" SMR. The adapter may be removed and reinstalled in the base, maintaining target position tolerance. Therefore you can quickly re-establish coordinate systems in the future by providing known, permanent reference points. This system may also be used without an initial survey to provide permanent coordinate system transfer points. Or, use them to monitor the movement of foundations or other features over time by checking for deviation from originally mapped coordinates.



An aggressive knurl around the circumference of the adapter assists with easy installation and removal from the THMF base. The adapter also has two blind holes which fit a 15130 spanner (purchased separately), if you need a little extra torque to remove it. The 1/4" shank with internal 6-32 tapped hole mates securely with the base unit, positively locking the adapter in place. The 1.5" SMR seats on a 3-point conical land and is held firmly in place by a magnet.

1.5THMF



The 15130 spanner wrench (not included) allows for easy removal of the 1.5THMF adapter from the THMF base if needed.



Specifications

Adapter dia.: 1.6" (40.6mm)

Material: Stainless steel, machine finish

Offset: 1.1250
±0.0005" (±0.013mm)

Hardness: HRC 42-45

Target Centering Tolerance: ±0.0005"

May be used with...

- Any 1.5" diameter SMR
- THMF Floor Mount



1.5INV Series SMR Adapter



Use an SMR target with your Invar System

The **1.5INV Series** magnetic adapters provide an SMR nest which fits on any of our Invar System bars. With both English and metric versions available, the centerpoint of a 1.5" diameter SMR may be held either 1.000" or 25mm away from the interface surface between the adapter and the Invar bar. The SMR seats on a 3-point conical land and is held in place by a strong magnet. The discontinuous three point mounting system gives extra room for the SMR to be tilted further away from the bar's main axis, giving additional mounting flexibility. The adapter's threaded mount is 3/8"-24 for compatibility with our Invar system.



Choose the desired model number from the table below, which shows both the English and metric versions of this adapter.

Model	Offset	Tolerance
1.5INV-1	1.000"	±0.0005"
1.5INV-25MM	25mm	±0.013mm



Specifications

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR
- Our Invar System tubing



THMF Mini Floor Mount Adapter



Permanent Reference Solution

The **THMF** is a flexible solution for installing permanent reference target mounts in your facility's floors or walls. Small in size, it provides a secure base which can hold either 1.5" or 0.5" SMR target adapters.

The THMF's knurled circumference and concave grooves give extra gripping power for gluing into place with epoxy or other grouting adhesives. The cap is outfitted with a straight blade screwdriver slot as well as an O-ring to seal out debris when not in use. The base of the THMF has a 6-32 machine screw located axially in the center of the bottom which is used to secure the cap as well as the target adapters.



The THMF provides several advantages over other floor mount adapters. It is only 1" tall and 0.75" in diameter. It provides a mounting base for the 1.5THMF target adapter (for a 1.5" SMR), or the 0.5THMF target adapter (for a 0.5" SMR). You may also wish to order part number 15478 (below right) to hold the THMF in place during installation, assuring flushness and perpendicularity with the mounting surface. The installation plate is secured to the THMF using one of the target adapters (see image below left) while the adhesive cures.



Specifications

Adapter size: 0.75" (19.05mm) dia. x 1" (25.4mm) high
Material: Stainless steel
Hardness: HRC 42-45

May be used with...

- Any 1.5" dia. SMR with 1.5THMF adapter
- Any 0.5" dia. SMR with .5THMF adapter
- Any TB Series tooling ball with 1/4" shank



1.5THP Pole Adapter

Reach higher and farther with an SMR pole adapter

The **1.5THP** pole adapter is handy when you need to measure something that is either too high or too far away to reach without assistance.

Drilled and tapped with an internal 3/4"-5 acme thread, the 1.5THP attaches easily to most standard paint roller poles or detachable broom sticks. A 1.5" SMR seats on a conical land and is held firmly in place by a magnet.



The 1.5THP has a connector which fits either of our lanyard kits. Use a lanyard kit (sold separately) to tether your SMR to the pole adapter and prevent it from falling.

At left: The 1.5THP with a 1.5" SMR and the 1.5LK-P lanyard kit.



Specifications

Weight: 0.37 lbs (0.17kg)

Material: Stainless Steel

Adapter size: 1.00" (25.4mm) x 3.00" (76.2mm)

May be used with...

- 1.5LK-P Basic Lanyard kit
- 1.5LK-F Deluxe Lanyard Kit
- Any 1.5" diameter SMR



1.5TH-M Series Magnetic Base SMR Adapters



For a more secure hold

The **1.5TH-M Series** magnetic adapters provide all of the features of our 1.5TH Series, with the addition of three magnets on the bottom surface of the adapter. These magnets provide a holding force if the adapter is placed in a hole in a ferrous material. The SMR seats on a 3-point conical land and is held in place by a magnet. An optical alley allows the SMR to be rotated down for a lower shooting angle. Various diameters and offsets are available - see tables below to construct the part number for the item you want.



Part Number
Construction:

1.5TH-M - A - B

Offset	A
1.000"	1
25 mm	25MM

Choose an "A" value above, and pair with desired "B" value (at right) to create the item number for the product that you want.
E.g., 1.5TH-M-1-.375

Shaft dia.	B	Shaft dia.	B
0.100"	.1	4mm	4MM
1/8"	.125	5mm	5MM
3/16"	.1875	6mm	6MM
1/4"	.25	7mm	7MM
5/16"	.3125	8mm	8MM
3/8"	.375	9mm	9MM
7/16"	.4375	10mm	10MM
1/2"	.5	11mm	11MM
9/16"	.5625	12mm	12MM
5/8"	.625	13mm	13MM
3/4"	.75	14mm	14MM
7/8"	.875	15mm	15MM
1"	1		

Specifications

Adapter dia: 1.6"

Material: Stainless steel

Shank diameter tolerance:
-0.0001" to -0.0005"
(-0.003mm to -0.013mm)

Offset tolerance:
±0.0005" (±0.013mm)

Target centering tolerance:
±0.0005" (±0.013mm)

Hardness: HRC 42-45

May be used with...

- Any 1.5" diameter SMR



1.5THF-C Compression Floor Mount Adapter

Install permanent floor mounts in minutes with no adhesive

The **1.5THF-C** Compression Floor Mount Adapter gives you an easy way to put a permanent target location in the floor or wall without using epoxies or other adhesives. Once installed, it may be immediately surveyed for its position. Establishing known, permanent reference points in this manner gives you the ability to quickly re-establish coordinate systems in the future. It may also be used without an initial survey to provide permanent coordinate system transfer points. Or, use them to monitor the movement of foundations over time by checking for deviation from originally mapped coordinates.



Install the 1.5THF-C into a 1.38" x 1.9" (35mm x 48mm) hole that is drilled in a concrete floor or wall (*pictured top left*). The top will be flush with the surface of the floor or wall.



Drop the corrosion-proof steel mount into the hole and drive the brass expansion sleeve into place around it using the installation tool (*sold separately*). No alignment, no cementing. The cap has an O-ring seal to keep the target mount surfaces out of danger and free of debris. A straight-bladed screwdriver allows easy removal of the lid. A 1.5" SMR seats on a three-point conical land and is held firmly in place by a magnet.



The 1.5THF-C floor mount adapter installation tool (*pictured at left*) is sold separately - ask for part number **17044**.

Specifications

- Material:** Stainless steel, brass
- Hardness:** HRC 42-45 (stainless steel)
- Weight:** 0.7lbs (0.32kg)

May be used with...

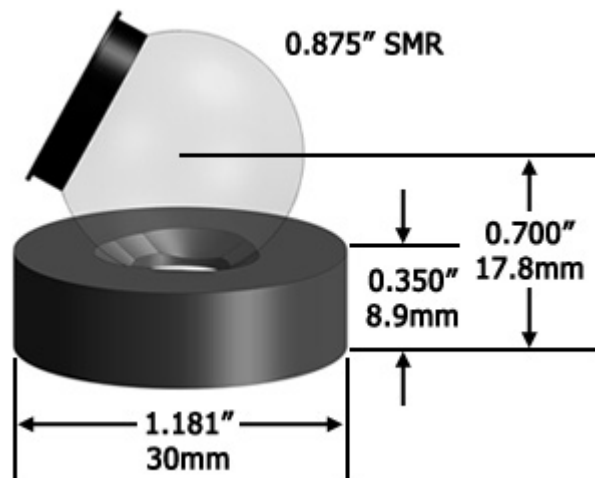
- Any 1.5" diameter SMR



0.875THDN Drift Nest

Put temporary targets on just about anything

The **0.875THDN**, or drift nest (sometimes called a "hockey puck"), provides a temporary, magnetic SMR adapter in almost any location and on almost any surface. The back of this adapter is flat. Note that the magnet holds the SMR in place but does not hold the adapter in its location. Use any general adhesive (we often use a hot glue gun) to attach these adapters temporarily to machine tools, concrete floors and pillars, posts, stands, or just about anything else that is available. When you're finished, remove the adapter and you're on your way to your next assignment. Works with a 0.875" diameter SMR.



Specifications

Adapter size: 1.181" (30mm) diameter by 0.350" (8.9mm) high

Material: Aluminum

Distance to Center of SMR: Approx. 0.700" (17.8mm) above base of the adapter

Finish: Hard anodized (black)

May be used with...

- Any 0.875" diameter SMR



0.875TH Series SMR Adapter



For use with 0.875" diameter SMR

The **0.875TH** series of magnetic adapters provides an SMR nest which mounts in holes having diameters from 1/8" to 5/8" or from 4mm to 15mm. Shank diameters are held to very close tolerances for precision slip fits. The adapter holds the center point of a 0.875" diameter SMR on centerline of the shank to a tolerance of $\pm 0.0005"$ ($\pm 0.013\text{mm}$). The adapter also holds the center of the SMR to a known offset height at a tolerance of $\pm 0.0005"$ ($\pm 0.013\text{mm}$). Refer to the table below for the available offset and shank diameter combinations. Choose any "A" value from the table below (center), and pair with any "B" value (table at right, below) to create the item number for the product that you want, for example, 0.875TH-.5-12MM.



Part number construction:

0.875TH - A - B



Offset	A
0.500" (see note*)	.5
1.000"	1
20mm	20MM

*Note: For adapters having an offset of 0.500", the following "B" choices are **not** available: .125, .1875, 4MM, 5MM, and 6MM.

Shank dia.	B	Shank dia.	B
1/8"	.125	4 mm	4MM
3/16"	.1875	5 mm	5MM
1/4"	.25	6 mm	6MM
5/16"	.3125	7 mm	7MM
3/8"	.375	8 mm	8MM
7/16"	.4375	9 mm	9MM
1/2"	.5	10 mm	10MM
9/16"	.5625	11 mm	11MM
5/8"	.625	12 mm	12MM
		13 mm	13MM
		14 mm	14MM
		15 mm	15MM

Specifications

Adapter diameter: 7/8" (22.2mm)

Material: Stainless steel

Shank diameter tolerance:
-0.0001" to -0.0005"
(-0.003mm to -0.013mm)

Hardness: HRC 42-45

May be used with...

- Any 0.875" diameter SMR

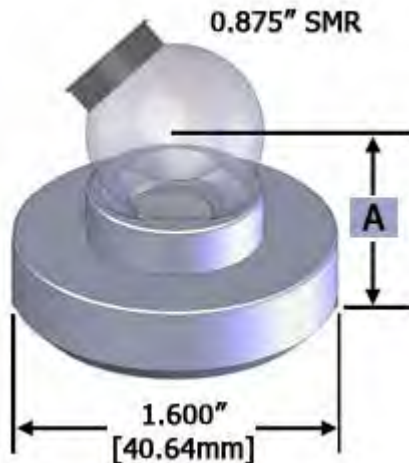


0.875THS Series Corner Adapter



For targeting an inside corner

The **0.875THS Series** magnetic adapters provide an SMR nest which fits into any corner and puts a 0.875" diameter SMR exactly 0.800" away from the rising surface, within ± 0.0005 ". It also holds the centerpoint of the SMR 1.000" ± 0.0005 " (or 25mm for the metric version) above the base surface. A chamfer on the bottom side of this adapter provides a relief for any fillets or various strange things happening at the junction between the surfaces of the object being measured. The SMR seats on a 3-point conical land. Use the table below to find the item number for the desired target offset.



Offset "A"	Part number
1.000"	0.875THS-1
25mm	0.875THS-25MM

Specifications

Adapter size: 1.6" diameter x ~0.69" high
(40.64mm dia. x ~17.5mm high)

Tolerance, offset dimension "A":
 ± 0.0005 " (± 0.013 mm) above the base surface.

Tolerance, center of SMR to edge of adapter: ± 0.0005 " (± 0.013 mm) away from rising surface.

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 0.875" diameter SMR



0.875THSC Self-Centering SMR Adapters



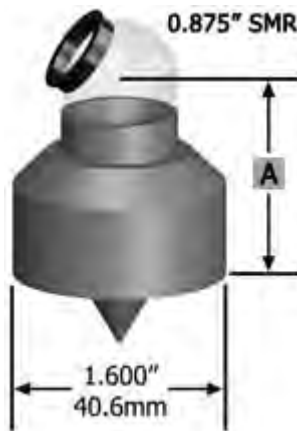
Conical plunger centers itself on multiple diameters

The **0.875THSC** magnetic adapter is used to gather quick data points over a range of hole sizes using a single adapter. The secret is a spring-loaded, cone-shaped, locating plunger (illustration below). This adapter will locate on hole sizes 0.100" to 0.625" (2.5mm to 15.9mm). Keep in mind that we can also make these adapters to fit other hole diameters on request. Three strong magnets on the bottom keep the adapter squarely on any ferrous surface, and counteract the spring-loaded force of the plunger. The adapter is reliable and repeatable. A knurled profile around the outer perimeter assists in removal after measuring is finished. The adapter holds the centerpoint of a 0.875" diameter SMR 1.500" (or 40mm for the metric version) above the surface of the part and on centerline of the hole to a tolerance of $\pm 0.0005"$ ($\pm 0.013\text{mm}$). The SMR seats on a conical land and is held in place by a magnet.



0.875THSC

The SMR seats on a conical land and is held in place by a magnet.



	Model No.	Offset "A"
English	0.875THSC-1.5	1.500"
Metric	0.875THSC-40MM	40mm



Specifications

Adapter dia: 1.600" (40.6mm)

Material: Stainless steel

Fits hole sizes: 0.100" to 0.625" (2.5mm to 15.9mm)

Offset tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Target centering tolerance:
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

May be used with...

- Any 0.875" diameter SMR



0.875THF Floor Mount Adapter

Install permanent monuments in the floor

The **0.875THF** floor target mount provides for a permanent target location in the floor or wall. Following initial installation, it may be surveyed for its final position. This gives you the ability to quickly re-establish coordinate systems in the future by providing known, permanent reference points. They may also be used without an initial survey to provide permanent coordinate system transfer points. Or use them to monitor the movement of foundations over time by checking for deviation from originally mapped coordinates.



The 0.875THF is meant to be grouted or epoxied permanently into holes which have been drilled in concrete floors or walls, so that the top is flush with the surface of the floor or wall. An



aggressive knurl around the circumference as well as large concave grooves give this target mount lots of holding power in the surrounding grout. The cap has an O-ring seal to keep the target mount surfaces out of danger and free of debris. The 0.875THF may be attached to a customer-provided positioning jig while being grouting in place, via the M4 threaded hole on top of the lid. In this way, the 0.875THF can be easily positioned so that the top is flush with the floor or wall, and in the desired position. A flat or straight screw driver allows easy removal of the lid.

The 0.875" SMR seats on a 3-point conical land and is held firmly in place by a ring magnet.

Specifications

Adapter size: 1.25" (31.75mm) diameter x 1.5" (38.1mm) high

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 0.875" diameter SMR



1.5ADP-.875 1.5" to 0.875" SMR Adapter



Put a 0.875" SMR accurately in a 1.5" nest

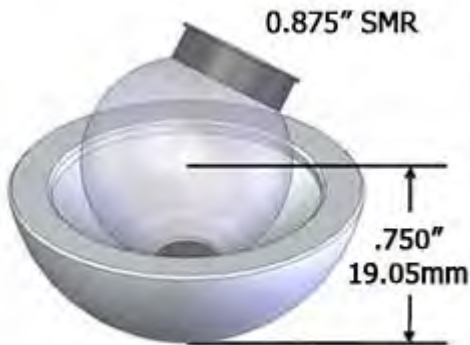
The **1.5ADP-.875** magnetic adapter gives you the ability to simulate a 1.5" SMR while actually using a 0.875" SMR. The adapter is a partial 1.5" diameter ball, precisely machined to hold the center of a 0.875" SMR at exactly the same point in space as the center of a 1.5" SMR. This allows you to accurately measure the positions of nests and target mounts designed for 1.5" SMRs. It also allows you to use measurement routines and macros designed for use with a 1.5" SMR.

The **1.5ADP-.875** comes in handy if you are switching SMR sizes during one measurement session in order to accommodate various nest sizes on your fixture or tools. Use it to avoid performing an extra home-point calibration on laser trackers when you're already set up to use a 1.5" SMR. It's also great for use with built-in reference systems designed for 1.5" SMRs - it gives you the



0.750" offset that you need, and allows you more freedom to switch back and forth between 1.5" and .875" SMR targets. It also gives you more flexibility when using a calibration ball bar which only has adapters for 1.5" SMRs.

The centerpoint of a 0.875" diameter SMR is held precisely 0.750" or 19.05mm above the surface of the part being measured. The SMR seats on a conical land and is held in place by a magnet.



Specifications

Tolerance: 0.875" SMR held to center of 1.5" diameter ball within $\pm 0.00025"$ (0.006mm)

Material: 440-C Stainless steel

Hardness: HRC 56-61

May be used with...

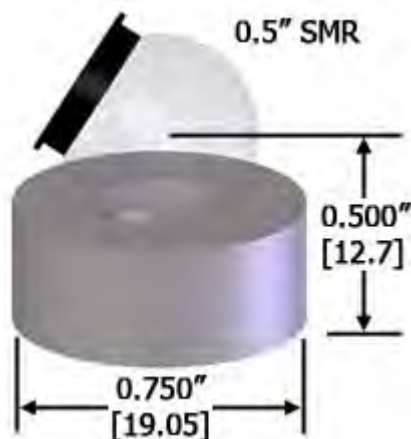
- Holds any 0.875" diameter SMR
- Fits in any 1.5" SMR nest



0.5THDN Drift Nest

Put temporary targets on just about anything

The **0.5THDN** drift nest provides a temporary, magnetic SMR adapter in almost any location and on almost any surface. Use any general adhesive (we often use a hot glue gun) to attach these adapters temporarily to machine tools, concrete floors and pillars, posts, stands, or just about anything else that is available. Note that the magnet is meant to secure the SMR to the adapter, but is not meant to hold the adapter to the surface on which it sits. When you're finished, remove the adapter and you're on your way to your next assignment. Works with a 0.5" diameter SMR.



Specifications

Adapter size: 0.75" diameter x 0.313" high (19.05mm dia. x 7.95mm high)

Material: Stainless steel

Hardness: HRC 42-45

Distance to center of SMR: Approx. 0.5" (12.7mm) above base of the adapter

May be used with...

- Any 0.5" diameter SMR



0.5THDN-T Drift Nest

Drift nest with extra tie-down security

The **0.5THDN-T** drift nest provides a temporary, magnetic SMR adapter in almost any location and on almost any surface. Use any general adhesive (we often use a hot glue gun) to attach these adapters temporarily to machine tools, concrete floors and pillars, posts, stands, or just about anything else that is available. A groove cut around the perimeter of the base allows for the addition of a customer-provided tie down, if desired, for extra security (great for FOD-critical areas). Works with a 0.5" diameter SMR.



Specifications

Adapter size: 0.75" diameter x 0.313" high (19.05mm dia. x 7.95mm high)

Material: Stainless steel

Hardness: HRC 42-45

Distance to center of SMR: Approx. 0.5" (12.7mm) above base of the adapter

May be used with...

- Any 0.5" diameter SMR



0.5TH Series SMR Adapters



Fits 1/8" - 3/8" and 4mm - 10mm diameter holes

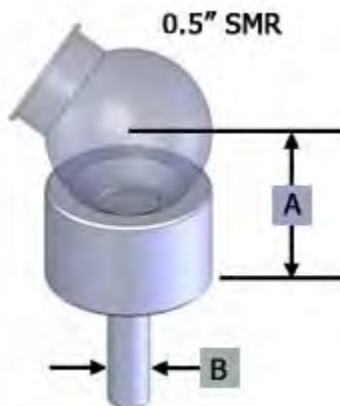
The **0.5TH** series of magnetic adapters provide nests (for 1/2" diameter SMRs) which mount in holes having diameters from 1/8" - 3/8", and from 4mm to 10mm. Shank diameters are held to very close tolerances for precision slip fits. The adapter holds the centerpoint of a 0.5" diameter SMR on centerline of the shank to a tolerance of $\pm 0.0005"$ (0.013mm). Shank diameters are held to very close tolerances for precision slip fits. Various diameters and offsets are available - see table below for descriptions and part numbers.



Choose any "A" value from the table (below), and pair with any "B" value (below, right) to create the item number for the product that you want, for example, 0.5TH-25MM-.375.

Part number construction:

0.5TH - A - B



Offset	A	Shank dia.	B	Shank dia.	B
5/16" (note*)	.3125	0.100"	.1	4 mm	4MM
1/2"	.5	1/8"	.125	5 mm	5MM
5/8"	.625	5/32"	.156	6 mm	6MM
1"	1	3/16"	.1875	7 mm	7MM
3"	3	1/4"	.25	8 mm	8MM
10 mm	10MM	9/32"	.2812	9 mm	9MM
12 mm	12MM	5/16"	.3125	10 mm	10MM
20 mm	20MM	3/8"	.375	12 mm	12MM
25 mm	25MM	7/16"	.4375		
		1/2"	.5		

*Note: For adapters having an offset of 5/16", the following "B" choices are **not** available: .1, .125, .156, .1875, 4MM, 5MM, and 6MM.

Specifications

Adapter dia: 1/2" (12.7mm) if shank dia. is equal to or less than 0.375" or 10mm. Otherwise, dia. is 3/4" (19.1mm).

Shank diameter tolerance: $-0.0001"$ to $-0.0005"$ (-0.003mm to -0.013mm)

Offset tolerance: $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 0.5" diameter SMR



0.5THS Series SMR Adapters

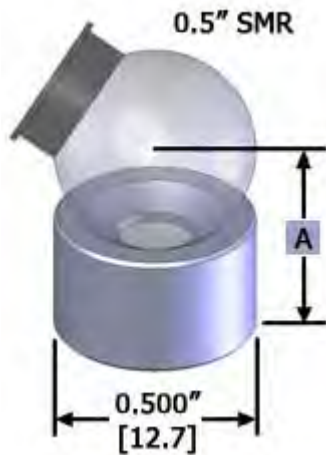


For use with 0.5" SMR

The **0.5THS Series** magnetic adapter provides a nest for a 0.5" SMR and holds it exactly 0.5" ± 0.0005 " above the base surface. The adapter also includes a magnet on the bottom surface to allow attachment to any magnetic surface.

Standard Part Numbers:

Offset "A"	Item number
0.500"	0.5THS-.5
12mm	0.5THS-12MM
25mm	0.5THS-25MM



Specifications

Adapter size: 0.5" diameter x 0.313" high (12.7mm diameter x 7.95mm high)

Hardness: HRC 42-45

Material: Stainless steel

May be used with...

- Any 0.5" diameter SMR



0.5THSC Self-Centering SMR Adapters

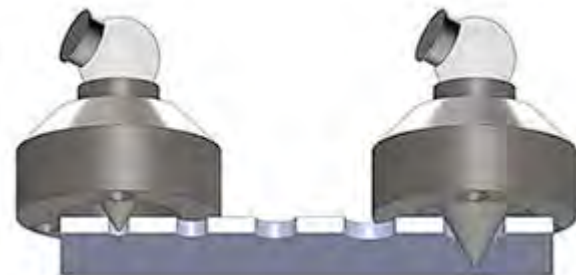


Conical plunger centers itself on multiple diameters

The **0.5THSC** magnetic adapter is used to gather quick data points over a range of hole sizes using a single adapter. The secret is a spring-loaded, cone-shaped, locating plunger (illustration below). This adapter will locate on hole sizes 0.100" to 0.420" (2.5mm to 10.5mm). Keep in mind that we can also make these adapters to fit other hole diameters on request. Three strong magnets on the bottom keep the adapter squarely on any ferrous surface, and counteract the spring-loaded force of the plunger. The adapter is reliable and repeatable. A grooved profile around the outer perimeter assists in removal after measuring is finished. The adapter holds the centerpoint of a 0.5" diameter SMR 1.000" (or 25mm for the metric version) above the surface of the part and on centerline of the hole to a tolerance of $\pm 0.0005"$ ($\pm 0.013\text{mm}$). The SMR seats on a conical land and is held in place by a magnet.



	Model No.	Offset "A"
English	0.5THSC-1	1.000"
Metric	0.5THSC-25MM	25mm



Specifications

Adapter dia: 1.250" (31.8mm) **Offset tolerance:** $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Material: Stainless steel

Fits hole sizes: 0.100" - 0.420" (2.5mm - 10.5mm)

Target centering tolerance: $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

May be used with...

- Any 0.5" diameter SMR



0.5THE Series Edge Adapter



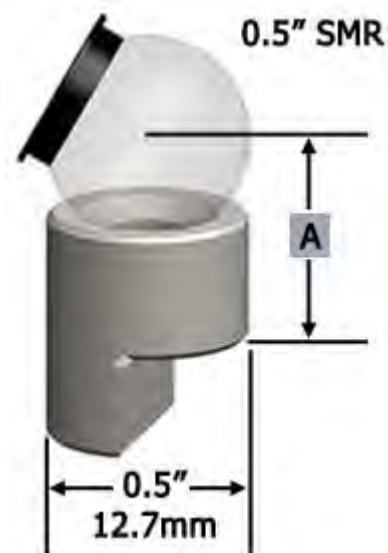
Fits an outside corner

The **0.5THE** magnetic adapter provides a nest for a 0.5" SMR, locating an edge (outside corner) within ± 0.0005 ". It also holds the centerpoint of the SMR precisely 0.500" (English version) or 12mm (metric version) above the surface of the part being measured. A relief groove at the intersection of the adapter's reference planes ensures a good fit over the outside corner of the feature you are measuring.



Choose the desired model number from the table below, which shows both the English and metric versions of this adapter.

Model	Offset "A"	Tolerance
0.5THE-.5	0.500"	± 0.0005 "
0.5THE-12MM	12mm	± 0.013 mm



Specifications

Adapter size: 0.5" (12.7mm) diameter

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 0.5" diameter SMR



0.5THE-M Series Edge Adapter



With magnets on mounting surfaces for hands-free use

The **0.5THE-M** magnetic adapter provides all the features of our 0.5THE Series adapters with the addition of two magnets; one on each of the mounting surfaces. These magnets hold the adapter firmly to the outside corner of any ferrous surface and allow for hands free work. For use with any 0.5" SMR.



Choose the desired model number from the table below, which shows both the English and metric versions of this adapter.

Model	Offset "A"	Tolerance
0.5THE-M-.5	0.500"	±0.0005"
0.5THE-M-12MM	12mm	±0.013mm



Specifications

Adapter size: 0.5" (12.7mm) diameter

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 0.5" diameter SMR



1.5ADP-.5 1.5" to 0.5" SMR Adapter



Put a 0.5" SMR accurately in a 1.5" nest

The **1.5ADP-.5** magnetic adapter gives you the ability to simulate a 1.5" SMR while actually using a 0.5" SMR. The adapter is a partial 1.5" diameter ball, precisely machined to hold the center of a 0.5" SMR at exactly the same point in space as a 1.5" SMR. This allows you to accurately measure the locations of nests and target mounts designed for 1.5" SMRs. It also allows you to use measurement routines and macros designed for use with a 1.5" SMR.

The **1.5ADP-.5** comes in handy if you are switching SMR sizes during one measurement session in order to accommodate various nest sizes on your fixture or tools. Use it to avoid performing an extra home-point calibration on laser trackers when you're already set up to use a 1.5" SMR. It's also great for use with built-in



reference systems designed for 1.5" SMRs - it gives you the 0.750" offset that you need, and allows you more freedom to switch back and forth between 1.5" and .5" SMR targets. It also gives you more flexibility when using a calibration ball bar which only has adapters for 1.5" SMRs.



The centerpoint of a 0.5" diameter SMR is held precisely 0.75" or 19.05mm above the surface of the part being measured. The SMR seats on a conical land and is held in place by a magnet.

Specifications

Tolerance: 0.5" SMR held to center of 1.5" diameter ball within $\pm 0.00025"$ (0.006mm)

Material: 440-C Stainless steel

Hardness: HRC 56-61

May be used with...

- Holds any 0.5" diameter SMR
- Fits in any 1.5" SMR nest



0.5THW Weld-on SMR Adapters

Weld-on adapters for permanent fixture use

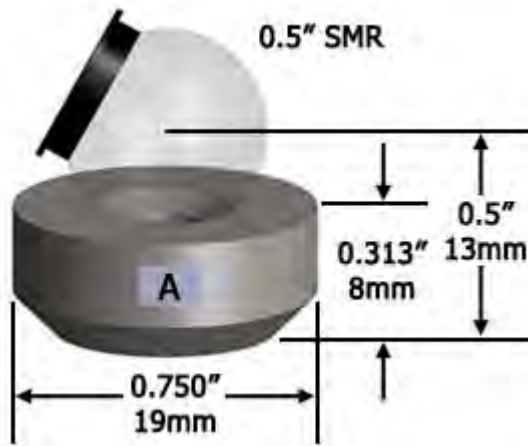
The **0.5THW** magnetic adapter is meant to be welded permanently in place on any customer fixture. A substantial chamfer around the bottom edge makes for a nicer weld. This item is **not** hardened like most of our other adapters, and is available in a variety of different materials (see table below). Place it on your fixture in any desired location, add a few weld tacks around the perimeter, and you have a permanent SMR reference. Think of it as a non-drifting drift nest.



The adapter holds the centerpoint of a 0.5" diameter SMR 0.5" above the surface of the part, although this dimension is not critically controlled because this adapter is simply meant to establish a permanent reference point. The SMR locates on a conical land.

The magnets are provided (one per adapter) but not installed. This is so that you can heat treat the entire fixture after all adapters are welded on (if desired) without affecting the magnetism of the magnets. When ready, the magnets may be installed in the magnet well. We recommend securing the magnets using an adhesive for extra security. Of course, this is mandatory for 0.5THW products constructed from non-magnetic materials. (Hint: don't do this until you are finished with your processing - sometimes they're very hard to get back out!)

Construct the desired part number using the table below, indicating desired material. Please note that other materials are available upon request.



Part Number Construction:

0.5THW - A

Material	A
6061 Aluminum	6061
7075 Aluminum	7075
1144 Steel	1144
17-4 Stainless	174
303 Stainless	303

Specifications

Adapter dia:
0.750" (19.1mm)

Material: See table above

May be used with...

- Any 0.5" diameter SMR



0.5THV Series Vector Target Adapter



Use two target points to define a line

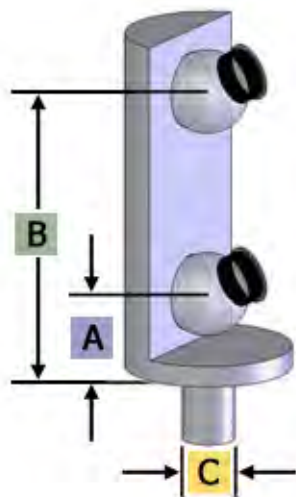
The **0.5THV Series** creates a vector by using two target locations, precisely on the centerline of the adapter. Using most any software, it is easy to locate the point on the centerline of the shank which lies on the surface of the object being measured. This adapter may be used to create vector lines to evaluate "remote" target points (e.g., a critical point downrange on a hinge line). It is also handy when you suspect that the target hole may not be drilled square to the surface.

Refer to the part number configuration information below. Pick a low offset, a high offset, and a shank diameter which specifies your desired item. For example, 0.5THV-.375-.750-.25.

Note that we cannot show all possible options - if you don't see exactly what you want, make up your own part numbers using the configuration information below.



Part Number Construction: 0.5THV - A - B - C



Low Offset	A	High Offset	B	Shank dia.	C
0.3125"	.3125	0.750"	.75	1/8"	.125
0.375"	.375	1.000"	1	1/4"	.25
0.500"	.5	1.250"	1.25	3/8"	.375
0.625"	.625	1.500"	1.5	1/2"	.5
8mm	8MM	2.00"	2	3/4"	.75
10mm	10MM	25mm	25MM	4 mm	4MM
12mm	12MM	30mm	30MM	6 mm	6MM
14mm	14MM	40mm	40MM	8 mm	8MM
16mm	16MM	60mm	60MM	10mm	10MM
You specify	Note 1	You Specify	Note 2	You Specify	Note 3

Note 1: Minimum value for A (low offset) is 0.3125" or 8mm.

Note 2: Maximum value for B (high offset) is 2.875" or 73mm. Not all high offsets are compatible with all low offsets.

Note 3: Minimum shank diameter is 0.100" (3mm). Maximum shank diameter is 0.750" (19mm)

Specifications

Adapter dia (main body): 1" (25.4mm)

Material: Stainless steel

Offset tolerance: $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

Shank diameter tolerance: $-0.0001"$ to $-0.0005"$ (-0.003mm to -0.013mm)

May be used with...

- Any 0.5" diameter SMR



0.5THMF SMR Adapter



0.5" Adapter for THMF Floor Mount

The **0.5THMF** adapter is designed to work with the THMF mini floor-mount base, giving you a permanent target location in the floor or wall. Following initial installation of the THMF base unit, this adapter may be installed and surveyed for its actual coordinates using a 0.5" SMR. The adapter may be removed and reinstalled in the base, maintaining target position tolerance. Therefore you can quickly re-establish coordinate systems in the future by providing known, permanent reference points. This system may also be used without an initial survey to provide permanent coordinate system transfer points. Or, use them to monitor the movement of foundations or other features over time by checking for deviation from originally mapped coordinates.



An aggressive knurl around the circumference of the adapter assists with easy installation and removal from the THMF base. The 1/4" shank with internal 6-32 tapped hole mates securely with the base unit, positively locking the adapter in place. The 0.5" SMR seats on a conical land and is held firmly in place by a magnet.

Specifications

Adapter size:
0.500" (12.7mm) diameter

Material: Stainless steel,
machine finish

Offset: 0.6250
 $\pm 0.0005"$ ($\pm 0.013\text{mm}$)

Hardness: HRC 42-45

**Target Centering
Tolerance:** $\pm 0.0005"$

May be used with...

- Any 0.5" dia. SMR
- THMF Floor Mount



0.5INV Series SMR Adapter



Use an SMR target with your Invar System

The **0.5INV** Series magnetic adapters provide an SMR nest which fits on any of our Invar System bars. With both English and metric versions available, the center point of a 0.5" diameter SMR may be held at a specified distance from the end of the Invar bar. Different models have different offsets (see table below). The SMR seats on a conical land and is held in place by a magnet. The adapter's threaded mount is 3/8"-24 for compatibility with our Invar system.



Choose the desired model number from the table below, which shows both the English and metric versions of this adapter.

Model	Offset "A"	Tolerance
0.5INV-.5	0.500"	±0.0005"
0.5INV-1	1.000"	- 0.0005"
0.5INV-12MM	12mm	±0.013mm
0.5INV-25MM	25mm	±0.013mm

Specifications

Material: Stainless steel

Hardness: HRC 42-45

May be used with...

- Any 0.5" diameter SMR
- Our Invar System tubing



0.5TH-M Series Magnetic Base SMR Adapters

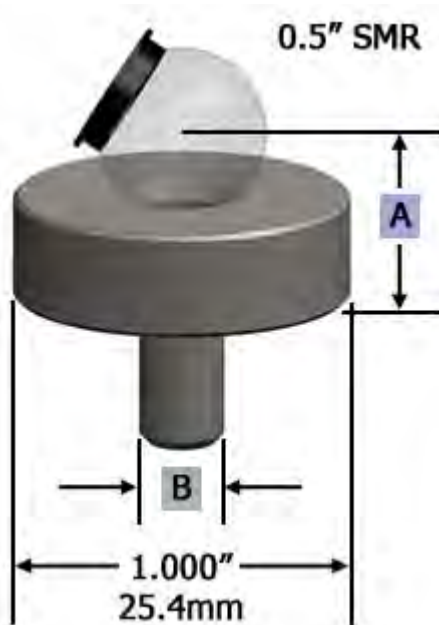


For a more secure hold on reality

The **0.5TH-M Series** magnetic adapters provide all the features of our 0.5TH Series, with the addition of three magnets on the bottom surface of the adapter. These magnets provide extra holding force if the adapter is placed into a hole in a ferrous material. Various diameters and offsets are available - see instructions below regarding how to construct the part number for the item you want.



0.5TH-M



0.5" SMR

0.5TH-M - A - B

Provide any "A" value and pair it with your desired "B" value to create the part number for the product that you want. See table at right for possible range of "B" values.

Offset	A
0.500"	.5
1.000"	1
10mm	10MM
12mm	12MM
25mm	25MM

Shank diameter B

Can be up to 0.5000". E.g., desired diameter of 0.3750" gives a part number of 0.5TH-M-1-.375

Can be up to 12 mm, in integral millimeters. E.g., desired diameter of 8mm gives a part number of 0.5TH-M-25MM-8MM

Specifications

Adapter dia: 1" (25.4mm)

Material: Stainless steel

Offset tolerance:
±0.0005" (±0.013mm)

Hardness: HRC 42-45

Shank diameter tolerance: -0.0001" to
-0.0005" (-0.003mm to -0.013mm)

May be used with...

- Any 0.5" diameter SMR



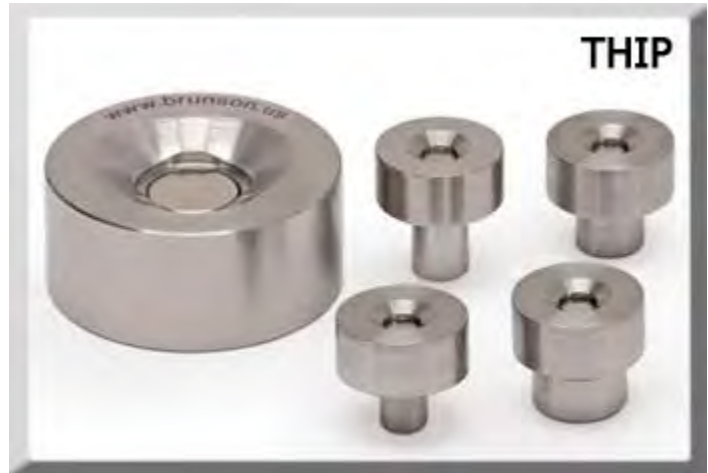
THIP Target Holder with Interchangeable Pins



Reduce inventory, cost, and inspection time

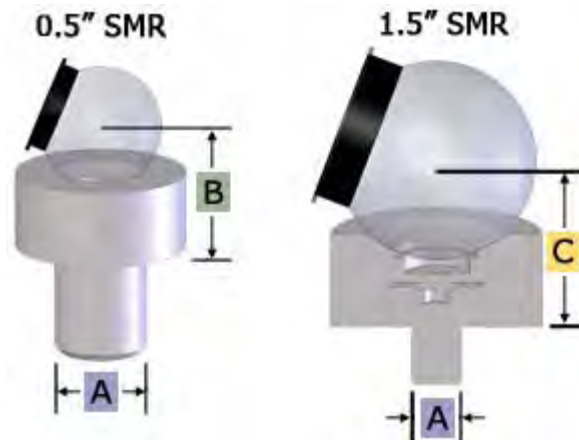
The **THIP** is handy for people who want to put 0.5" and 1.5" SMRs in the same locations. You get multiple pin nests in one flexible solution. You can work more quickly, and at a lower cost than two comparable sets of pin nests. Reduce time spent making pin nest changes and keeping track of inventory.

The kit contains four "base" pin nests that can hold a 0.5" SMR. Additionally there is a uniquely crafted 1.5" SMR adapter that fits with fine-tuned precision over the base pin nests, transforming them into a 1.5" SMR target holder. This larger adapter has three bottom-mounted magnets as well as an air release to make removal from the base adapters easy.



The kit comes with a custom, light-weight plastic case (*below, left*). Need additional shank sizes? We can customize the base target holders to your specifications and add them to your kit. The case holds up to four additional base units.

Kits are available in English (order item THIP-E) or Metric units (order item THIP-M).



THIP-E			
contains these four base target holders:			
Base	Shank Dia. (A)	Offset to 0.5" SMR (B)	Offset to 1.5" SMR (C)
#1	0.2500"	0.500"	1.300"
#2	0.3125"	0.500"	1.300"
#3	0.3750"	0.500"	1.300"
#4	0.5000"	0.500"	1.300"

THIP-M			
contains these four base target holders:			
Base	Shank Dia. (A)	Offset to 0.5" SMR (B)	Offset to 1.5" SMR (C)
#1	6mm	12mm	35mm
#2	8mm	12mm	35mm
#3	10mm	12mm	35mm
#4	12mm	12mm	35mm

Specifications

Adapter dia:

Base target holders: 0.700" (17.78 mm)
 Large target holder: 1.6" (40.6mm)

Target centering tolerance:

Base target holders: ±0.0005" (±0.013mm)
 Large target holder: ±0.0012" (±0.030mm)

Material: Stainless steel

Shank diameter tolerance:

-0.0001" to -0.0005" (-0.003mm to -0.013mm)

Offset tolerance for all target holders:

±0.0005" (± 0.013mm)

Hardness: HRC 42-45

Case Dimensions: 9" x 8" x 4"

Weight: 2.2 lbs (.98kg) with case

May be used with...

- Any 0.5" or 1.5" diameter SMR



BXT Series Bar Extensions

Allows use of sphere-fit routines for hard-to-target points

The **BXT Series** Bar Extensions are used in conjunction with the Tooling Ball Adapters (TBA) or Bar Points (BP) on one end, and various SMR holders having a mating shank (1/4" or 6mm) on the other. This type of assembly (see photo below) is often used to locate and specify points using sphere-fit routines*. Use our BP point with the BXT bars when targeting scribe lines or other points of interest on surfaces or contours. Then replace the BP with our TBA adapter to target the centers of tooling balls. Or, use this assembly and the sphere-fit procedure with our Construction Tooling Ball (TB) targeting accessory. This technique is especially useful when the desired targets are obscured from view. It allows you to avoid making additional tracker moves and subsequent rebundles, thereby saving time and potential error buildup. These adapters make more efficient use of your laser tracker equipment while maintaining the accuracy needed for most tasks.

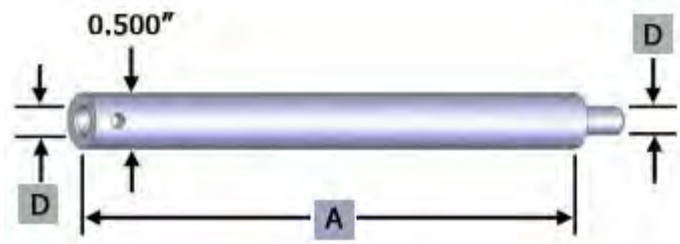


English or metric bars are available, having, respectively, 1/4" or 6mm shanks and matching 1/4" or 6mm precision bores on the opposite end of the bar. All shanks are drilled and tapped with a 6-32 internal thread. The shank then mates with the connecting screw on the inside of an TBA or BP tip, again assuming that English and metric tips are matched with English and metric bars, respectively. Both tips are seen in the photo at left. The precision bore on the opposite end will accept SMR nests which have a matching shank diameter (1/4" or 6mm), such as 1.5TH-1-.25 or 1.5TH-25MM-6MM. These accessories are held in place with a radially-mounted, nylon-tipped setscrew.

* A "sphere fit rod" assembly (right) may be constructed from a BXT bar, an SMR adapter, and a BP Bar Point or a TBA Tooling Ball Adapter. It is used to measure a number of points which are all a given distance away from one particular point of interest, making that point of interest the center of an arbitrary sphere. Then, a sphere-fit routine is commonly used to calculate that center point.



Model	Length "A"	Dia. "D"
BXT-5	5.0000"	0.250"
BXT-10	10.0000"	0.250"
BXT-125	125mm	6mm
BXT-250	250mm	6mm



Specifications

Tolerance, precision bore: +0.0005",
-0.0000" (+0.013, -0.000mm)

Tolerance, length: ±0.0005" (±0.013mm)

Tolerance, shank: +0.0000",
-0.0005" (+0.000mm, -0.013mm)

Material: Stainless Steel

Hardness: HRC 42-45

May be used with...

- BP Bar Point
- TBA Tooling Ball Adapter
- 1.5TH-x-.25, 0.875TH-x-.25, or 0.5TH-x-.25 (may be used with BXT-5 and BXT-10)
- 1.5TH-x-6MM, 0.875TH-x-6MM, or 0.5TH-x-6MM (may be used with BXT-125 and BXT-250)

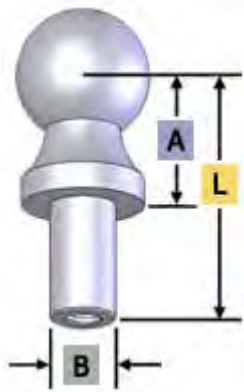


TB Series Construction Tooling Ball

Find hole centers easily with this reference artifact

The **TB Series** construction balls are used for applications requiring a 1/2" (English version) or 12mm (metric version) reference ball located a known distance from a surface, or on the centerline of a hole. The shank diameter is held to very close tolerances for a precision slip fit into our BXT extension bar or customer-provided tools. Various offset dimensions and shank diameters are available. Choose from the available sizes shown in the table below.

Note: This product is not recommended for use as a target with scanner systems. Instead, we offer our TBHR Series of highly reflective tooling balls.



Part No.	Ball Dia.	Offset "A"	Shank Dia. "B"	Length "L"	Internal Thread*
TB-.3125-.25	0.500"	0.3125"	0.250"	0.63"	6-32 UNC
TB-.5-.25	0.500"	0.500"	0.250"	0.94"	6-32 UNC
TB-.5-.3125	0.500"	0.500"	0.3125"	0.94"	6-32 UNC
TB-.5-.375	0.500"	0.500"	0.375"	1.50"	n.a.
TB-12MM-6MM	12mm	12mm	6mm	22.10mm	n.a.

*Not all items have an internally threaded shank

Specifications

Concentricity between ball and shank:
0.0002" TIR (0.005mm TIR)

Tolerance, shank diameter: +0.0000",
-0.0004" (+0.000mm, -0.010mm)

Tolerance, offset dimension:
±0.0002" (±0.005mm)

Ball diameter tolerance: +0.0000",
-0.0004"
(+0.000mm, -0.010mm)

Material: 1144 steel

Hardness: HRC 54-56

May be used with...

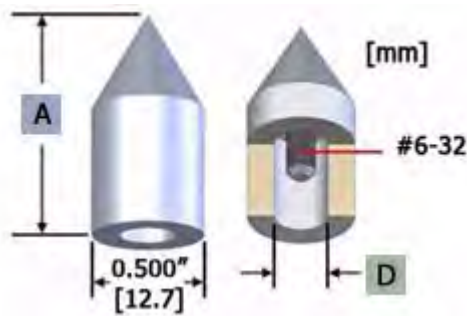
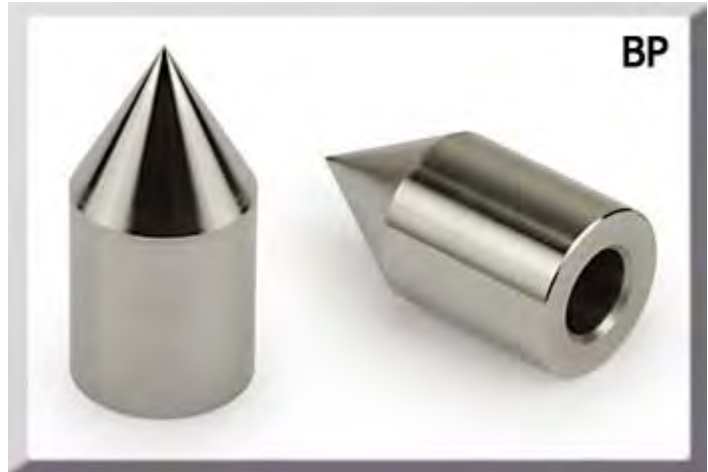
- 12410-G2 Concave tip for Invar system (TBs having 0.5" diameter ball only)
- BXT Series extension bars (be sure to match BXT bar to your TB, some TBs do not fit some BXTs)
- TBA Series (be sure to match TBA adapters to your TB, some TBs do not work with some TBAs)



BP Series Bar Points

Target scribe lines or other points of interest

The **BP** Series Bar Points are used in conjunction with our BXT Series extension bars and various SMR holders having 1/4" or 6mm shafts. This type of assembly (see photo below) is often used to locate and specify various points using a sphere-fit routine*. The BP is handy for targeting scribe lines, edges, or other points of interest on surfaces or contours. It is especially useful for measuring points which are obscured from view. Using the BP with its targeting assembly to measure hidden points allows you to avoid making additional tracker moves and subsequent rebundles, thereby saving time and potential error buildup. These adapters make more efficient use of your laser tracker equipment while maintaining the accuracy needed for most tasks.



Model	"A" Offset	"D" Dia.
BP-1	1.000"	.2500"
BP-25MM	25mm	6mm

The BP includes a #6-32 set screw at the bottom of the hole (see sketch at left). This is used to secure the BP to our BXT extension bars. Be sure to match the BP unit type with BXT unit type (English or metric).



*A "sphere fit rod" assembly (right) may be constructed from a BXT extension bar, an SMR adapter, and a BP Bar Point. It is used to measure a number of points which are all a given distance away from one particular point of interest, making that point of interest the center of an arbitrary sphere. Then, a sphere-fit routine is commonly used to calculate that center point. In the picture, the BP is centered on a scribe line.

Specifications

Hole tolerance: +0.0005", -0.0000" (+0.013mm, -0.000mm)

Material: Stainless Steel

Length tolerance: ±0.0005" (±0.013mm)

Hardness: HRC 42-45

May be used with...

- BXT Series Extension Bars



THB Series Target Holder Bushings

Get more measurement flexibility

The **THB Series** Target Holder Bushings are great for converting targeted holes to the shank size of your SMR adapters. Slip this precision bushing into the hole you wish to target, and the new bore diameter will fit the SMR adapter, holding it on center of the original hole.



Choose an "A" value from the table below, and pair with a "B" value to create the item number for the product that you want, for example, THB-.375 - .25. Or, use this part number format to describe your own custom size bushing.



Outer dia.	A	D	Outer dia.	A	D
0.2500"	.25	0.625"	8mm	8MM	18mm
0.3125"	.3125	0.688"	10mm	10MM	20mm
0.3750"	.375	0.750"	12mm	12MM	22mm
0.4375"	.4375	0.813"	14mm	14MM	24mm
0.5000"	.5	0.875"	16mm	16MM	26mm
0.6250"	.625	1.000"	18mm	18MM	28mm
0.7500"	.75	1.125"	20mm	20MM	30mm
1.0000"	1	1.375"	22mm	22MM	32mm

Part number construction:

THB - A - B

Bore dia.	B
0.1875"	.1875
0.2500"	.25
4mm	4MM

Specifications

OD tolerance: +0.0000",
-0.0005" (+0.000mm, -0.013mm)

ID tolerance: +0.0005",
-0.0000" (+0.013mm, -0.000mm)

Flange thickness: 0.200" ±0.0005" for English;
5mm ±0.013mm for metric

Material: Stainless Steel

Hardness: HRC 42-45

May be used with...

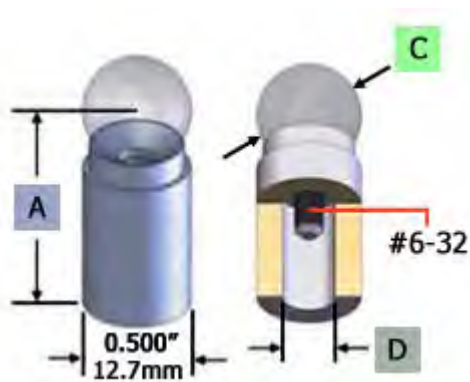
- 1.5TH-x-.25 (with 1/4" shank)
- 0.875TH-x-.25 (with 1/4" shank)
- 0.5TH-x-.25 (with 1/4" shank)
- Any SMR adapter or targeting aid with a 1/4" shank



TBA Series Tooling Ball Adapters

When you need to reference a tooling ball

The **TBA** Series Tooling Ball Adapters are used in conjunction with our BXT Series extension bars and various SMR holders having 1/4" or 6mm shafts. This type of assembly (photo below) is often used to locate and specify points using a sphere-fit routine*. The TBA is handy for targeting tooling balls such as our TB. It is especially useful for measuring points which are obscured from view. Using the TBA (with its targeting assembly) on hidden points helps you avoid making unnecessary tracker moves and subsequent rebundles, thereby saving time and potential error buildup. These adapters make more efficient use of your laser tracker equipment while maintaining the accuracy needed for most tasks.



The TBA has a 6-32 set screw at the bottom of the hole (see sketch at left). This is used to secure the TBA to our BXT extension bars. Be sure to choose a TBA having the same units (English or metric) as your BXT bar.

Model	"A" Offset	"D" Dia.	Sphere dia. "C"
TBA-1	1.000"	0.2500"	0.5000"
TBA-25MM	25mm	6mm	12mm

* A "sphere fit rod" assembly (right) may be constructed from a BXT Extension Bar, an SMR adapter, and an TBA Tooling Ball Adapter. It is used to collect points which are all a given distance away from one particular point, making that point the center of an arbitrary sphere. Then, a sphere-fit routine is used to determine that center point. Above, the TBA is held against a tooling ball.



Specifications

Tolerance, precision hole dia.:

+0.0005", -0.0000"
(+0.013mm, -0.000mm)

Tolerance, offset "A": ± 0.0005 " (± 0.013 mm)

Material:

Stainless Steel

Hardness:

HRC 42-45

May be used with...

- BXT Series Extension Bars
- TB (0.5" or 12mm construction tooling ball)
- Any 1/2" or 12mm tooling ball, depending upon TBA version (English or metric)



0.5RH SMR "Handle"

To help hold and place 0.5" SMRs

The **0.5RH** "handle" gives you a way to handle those small - and easily dropped - 0.5" SMRs. A magnet secures the SMR to the end of the handle, and the 4" rubberized grip gives you something to hold on to. Note: this tool is designed to increase your dexterity and "drop" safety factor when moving and placing 0.5" SMRs - but it's not a foolproof guarantee! We always recommend care when handling SMRs.



Specifications

Material: Stainless steel with rubberized grip

Length: 4" (10.2cm)

May be used with...

- 0.5" SMR



1.5LK-P Basic Lanyard Kit

Protect your SMR investment

The **1.5LK-P** basic lanyard kit helps to protect your SMRs from the undesirable consequences of high speed descents caused by gravity. The kit gives you the ability to secure the SMR to your wrist as you work. A small gauge, jacketed wire cable provides ample strength and security. The cable and other components of the kit are outfitted with quick release fittings. Two SMR collars are provided; one each for PLX and ProSystems SMRs. Similar kit 1.5LK-F provides not only wrist strap protection but the ability to secure the SMR to various target holder nests as well.



Kit Contents

Wrist strap (Velcro®)
Collar for PLX SMR
Collar for ProSystems SMR
8" quick release cable



May be used with...

- 1.5" PLX or ProSystems SMR



1.5LK-F Deluxe Lanyard Kit

Protect your SMR investment

The **1.5LK-F** deluxe lanyard kit helps to prevent your expensive SMR from taking a header onto that soft concrete floor below. The kit gives you everything required to secure the SMR either to your wrist or to many of our magnetic target holder nests. Small gauge, jacketed wire cables (two different lengths) provide ample strength and security. The cables and all other components of the kit are outfitted with quick release fittings, providing configuration flexibility. Two SMR collars are provided; one each for PLX and ProSystems type SMRs. Two target holder collars are also provided. One has a 1.6" I.D. (fits many of our 1.5" SMR target holders) and the other has a 2" I.D. (fits target holders such as our 1.5THDN drift nests). Similar kit 1.5LK-P provides wrist strap protection only.



Kit Contents

Wrist strap (Velcro®)
Collar for PLX SMR
Collar for ProSystems SMR
1.6" diameter nest collar
2" diameter nest collar
8" quick release cable
14" quick release cable



May be used with...

- 1.5" PLX or ProSystems SMRs
- Any 1.6" diameter target holder nest
- Any 2" diameter target holder nest



1.5ADP-RPR Series Probe Adapters

Make any 1.5" SMR Nest into a Spherical Probe Receiver

The **1.5ADP-RPR** probe adapters give you the ability to measure the location of a 1.5" SMR nest with a portable CMM measuring system. The adapter is a partial 1.5" diameter ball, precisely machined to hold the center of a spherical probe tip at exactly the same point in space as the center of the 1.5" SMR. This allows you to accurately measure the positions of nests and target mounts designed for 1.5" SMRs.



Cutaway view (above) shows 1.5ADP-RPR probe adapter sphere with tip of portable CMM probe (in red) located at the center of the sphere.

The 1.5ADP-RPR comes in handy if you are required to use multiple measuring systems on one job, cannot obtain line-of-sight with a laser, or only have access to a portable CMM. The center point of the probe's spherical tip is held precisely 0.75" or 19.05mm above the surface of the part being measured. To construct the appropriate part number, substitute the diameter of your probe for "A" in the legend shown below. E.g., to fit a 3mm probe, the part number would be 1.5ADP-RPR-3.

Part Number Construction

1.5ADP-RPR - A

Specifications

Tolerance: Holds spherical probe tip to center of 1.5" (38.1mm) diameter ball within $\pm 0.00025"$ ($\pm 0.006\text{mm}$)

Material: 440-C Stainless steel

Hardness: HRC 56-61

Adapter Dia.: 1.5" (38.1mm)

May be used with...

- Fits in any 1.5" SMR nest



0.5THC SMR Retainer Clamps

SMR retainers with vertical or horizontal freedom of motion

Our **0.5THC-V** (vertical) and **0.5THC-H** (horizontal) SMR retaining clamps gives you another way to protect those valuable SMRs from damage. Put the SMR in the target nest, then slip the retainer over the SMR. Then use the flat-tipped M3 set screws to secure the clamp to the target holder. The 0.5THC-H clamps allow the SMR to rotate horizontally, with a 200° range of motion. The 0.5THC-V clamps allow the SMR to rotate vertically, with a 90° range of motion (allowing the SMR to point straight up). All 0.5THC models fit 0.5" SMRs, but the diameter of the pin nest must also be considered when choosing the desired model (see table below).



0.5THC-H

The 0.5THC-H (left) captures the SMR but allows it to rotate horizontally.

The 0.5THC-V (right) captures the SMR but allows it to rotate vertically.



0.5THC-V

Model	For SMR Size	For target holder dia.
0.5THC-V-.5	0.5"	0.5"
0.5THC-H-.5	0.5"	0.5"
0.5THC-V-.75	0.5"	0.75"
0.5THC-H-.75	0.5"	0.75"

Specifications

Set screws: M3 (2 each)

Range of SMR rotation: 200° for horizontal ("-H") models; 90° for vertical ("-V") models

Material: Aluminum (no finish)

Physical size		
Model	Dia. [mm]	Height [mm]
0.5THC-V-.5	0.75" [19]	0.5" [12.7]
0.5THC-H-.5	0.75" [19]	0.69" [17.5]
0.5THC-V-.75	1" [25.4]	0.5" [12.7]
0.5THC-H-.75	1" [25.4]	0.69" [17.5]

May be used with...

- 0.5THC-.5 models retain a 0.5" diameter SMR mounted in a nest having a 0.5" diameter
- 0.5THC-.75 models retain a 0.5" diameter SMR mounted in a nest having a 0.75" diameter



1.5THC SMR Retainer Clamps

SMR retainers with vertical or horizontal freedom of motion

Our **1.5THC-V** (vertical) and **1.5THC-H** (horizontal) SMR retainer clamps give you another way to protect those valuable SMRs from damage. Put the SMR in the target nest, and slip the retainer over the SMR. Then use the flat-tipped M3 set screws to firmly secure the retainer to the target holder. The 1.5THC-H clamps allow the SMR to rotate horizontally, with a 200° range of motion. The 1.5THC-V clamps allow the SMR to rotate vertically, with a 90° range of motion (allowing the SMR to point straight up). All 1.5THC models are designed to retain 1.5" SMRs in nests which have a 1.6" diameter.



1.5THC-H

The 1.5THC-H (left) captures the SMR but allows it to rotate horizontally.

The 1.5THC-V (right) captures the SMR but allows it to rotate vertically.



1.5THC-V

Specifications

Set screws: M3 (3 each)

Range of SMR rotation: 200° for 1.5THC-H;
90° for 1.5THC-V

Material: Aluminum (no finish)

Model	Physical size	
	Dia. [mm]	Height [mm]
1.5THC-V	1.85" [47]	1.3" [33]
1.5THC-H	1.85" [47]	1.75" [44.4]

May be used with...

- Any 1.5" diameter SMR in a nest having a 1.6" diameter. This includes most of our target holders which are designed for 1.5" SMRs.



THK-CE Combination 0.5" and 1.5" Target Holder Kit



Everything you need at your fingertips

Our **THK-CE** target holder kit contains a collection of our most popular and widely used target holders. This kit combines target holders for 0.5" SMRs and target holders for 1.5" SMRs to give you the additional flexibility. The kit includes a variety of target holders for measuring holes, edges, corners, surfaces, diameters, and more.



All target holders with critical dimensions are Certified and Serialized, verifiable by the included certificate. See content listing in the table below.

Left: The kit components come in a foam-lined, waterproof case.

Qty	Model	Description	Qty	Model	Description
10	0.5THDN	0.5" Drift nest	10	1.5THDN	1.5" Drift nest
1	0.5TH-.5-.1875	0.5" Target holder	1	1.5TH-1-.1875	1.5" Target holder
1	0.5TH-.5-.25	0.5" Target holder	1	1.5TH-1-.25	1.5" Target holder
1	0.5TH-.5-.375	0.5" Target holder	1	1.5TH-1-.375	1.5" Target holder
1	0.5TH-.5-.4375	0.5" Target holder	1	1.5TH-1-.4375	1.5" Target holder
1	0.5TH-.5-.5	0.5" Target holder	1	1.5TH-1-.5	1.5" Target holder
1	0.5THE-M-.5	0.5" Edge Adapter	1	1.5THLE-1	1.5" Large Edge Adapter
1	0.5THS-.5	0.5" Shankless Target Holder	1	1.5THS-1	1.5" Shankless Target Holder
1	0.5THV-.4375-1.6875-.25	0.5" Vector Target	1	BP-1	Bar Point
1	1.5ADP-.5	0.5" to 1.5" SMR Adapter	1	BXT-10	10" Bar extension
1	0.5RH	0.5" SMR handle	1	8001-4	1/16" Hex Allen wrench

Specifications

May be used with...

Approx weight: Case and contents, 8 lbs (3.6 kg)

Case: Foam-lined, injection molded, waterproof

- Any 0.5" SMR
- Any 1.5" SMR



THK-CM Combination 0.5" and 1.5" Metric Target Holder Kit



Everything you need at your fingertips

Our **THK-CM** metric target holder kit contains a collection of our most popular and widely used target holders. This kit combines target holders for 0.5" SMRs and target holders for 1.5" SMRs to give you the additional flexibility. The kit includes a variety of target holders for measuring holes, edges, corners, surfaces, diameters, and more.



All target holders with critical dimensions are Certified and Serialized, verifiable by the included certificate. See content listing in the table below.

Left: The kit components come in a foam-lined, waterproof case.

Qty	Model	Description	Qty	Model	Description
10	0.5THDN	0.5" Drift nest	10	1.5THDN	1.5" Drift nest
1	0.5TH-12MM-6MM	0.5" Target holder	1	1.5TH-25MM-6MM	1.5" Target holder
1	0.5TH-12MM-8MM	0.5" Target holder	1	1.5TH-25MM-8MM	1.5" Target holder
1	0.5TH-12MM-10MM	0.5" Target holder	1	1.5TH-25MM-10MM	1.5" Target holder
1	0.5TH-12MM-12MM	0.5" Target holder	1	1.5TH-25MM-12MM	1.5" Target holder
1	0.5THE-M-12MM	0.5" Edge Adapter	1	1.5THLE-25MM	1.5" Large Edge Adapter
1	0.5THS-12MM	0.5" Shankless Target Holder	1	1.5THS-25MM	1.5" Shankless Target Holder
1	0.5THV-.4375-1.6875-6MM	0.5" Vector Target	1	BP-25MM	Bar Point
1	1.5ADP-.5	0.5" to 1.5" SMR Adapter	1	BXT-250MM	250mm Bar extension
1	0.5RH	0.5" SMR handle	1	8001-4	1/16" Hex Allen wrench

Specifications

May be used with...

Approx weight: Case and contents, 8 lbs (3.6 kg)

- Any 0.5" SMR
- Any 1.5" SMR

Case: Foam-lined, injection molded, waterproof



THK-1.5E 1.5" Target Holder Kit



Everything you need at your fingertips

Our **THK-1.5E** target holder kit contains a collection of our most popular and widely used target holders. This kit contains target holders for 1.5" SMRs. The kit includes a variety of target holders for measuring holes, edges, corners, surfaces, diameters, and more.



All target holders with critical dimensions are Certified and Serialized, verifiable by the included certificate. See content listing in the table below.

Left: The kit components come in a customizable, foam-lined, waterproof case.

Qty	Model	Description	Qty	Model	Description
10	1.5THDN	1.5" Drift nest	1	1.5THLE-1	1.5" Edge Adapter
1	1.5TH-1-.1875	1.5" Target holder	1	1.5THS-1	1.5" Shankless Target Holder
1	1.5TH-1-.25	1.5" Target holder	1	BP-1	Bar Point
1	1.5TH-1-.375	1.5" Target holder	1	BXT-10	10" Bar extension
1	1.5TH-1-.4375	1.5" Target holder	1	8001-4	1/16" Hex Allen wrench
1	1.5TH-1-.5	1.5" Target holder			

Specifications

May be used with...

Approx weight: Case and contents, 7 lbs (3.2 kg)

- Any 1.5" SMR

Case: Foam-lined, injection molded, waterproof



THK-1.5M 1.5" Metric Target Holder Kit



Everything you need at your fingertips

Our **THK-1.5M** metric target holder kit contains a collection of our most popular and widely used target holders. This kit contains target holders for 1.5" SMRs. The kit includes a variety of target holders for measuring holes, edges, corners, surfaces, diameters, and more.



All target holders with critical dimensions are Certified and Serialized, verifiable by the included certificate. See content listing in the table below.

Left: The kit components come in a customizable, foam-lined, waterproof case.

Qty	Model	Description	Qty	Model	Description
10	1.5THDN	1.5" Drift nest	1	1.5THLE-25MM	1.5" Edge Adapter
1	1.5TH-25MM-6MM	1.5" Target holder	1	1.5THS-25MM	1.5" Shankless Target Holder
1	1.5TH-25MM-8MM	1.5" Target holder	1	BP-25MM	Bar Point
1	1.5TH-25MM-10MM	1.5" Target holder	1	BXT-250MM	250mm Bar extension
1	1.5TH-25MM-12MM	1.5" Target holder	1	8001-4	1/16" Hex Allen wrench

Specifications

May be used with...

Approx weight: Case and contents, 7 lbs (3.2 kg)

- Any 1.5" SMR

Case: Foam-lined, injection molded, waterproof



THK-.5E 0.5" Target Holder Kit



Everything you need at your fingertips

Our **THK-.5E** target holder kit contains a collection of our most popular and widely used target holders. This kit contains target holders for 0.5" SMRs. The kit includes a variety of target holders for measuring holes, edges, corners, surfaces, diameters, and more.



All target holders with critical dimensions are Certified and Serialized, verifiable by the included certificate. See content listing in the table below.

Left: The kit components come in a customizable foam-lined, waterproof case.

Qty	Model	Description	Qty	Model	Description
10	0.5THDN	0.5" Drift nest	1	0.5THS-.5	0.5" Shankless Target Holder
1	0.5TH-.5-.1875	0.5" Target holder	1	0.5THV-.4375-1.6875-.25	0.5" Vector Target
1	0.5TH-.5-.25	0.5" Target holder	1	1.5ADP-.5	0.5" to 1.5" SMR Adapter
1	0.5TH-.5-.375	0.5" Target holder	1	0.5RH	0.5" SMR handle
1	0.5TH-.5-.4375	0.5" Target holder	1	BP-1	Bar Point
1	0.5TH-.5-.5	0.5" Target holder	1	BXT-10	10" Bar extension
1	0.5THE-M-.5	0.5" Edge Adapter	1	8001-4	1/16" Hex Allen wrench

Specifications

May be used with...

Approx weight: Case and contents, 7 lbs (3.2 kg)

- Any 0.5" SMR

Case: Foam-lined, injection molded, waterproof



THK-.5M 0.5" Metric Target Holder Kit



Everything you need at your fingertips

Our **THK-.5M** metric target holder kit contains a collection of our most popular and widely used target holders. This kit contains target holders for 0.5" SMRs. The kit includes a variety of target holders for measuring holes, edges, corners, surfaces, diameters, and more.



All target holders with critical dimensions are Certified and Serialized, verifiable by the included certificate. See content listing in the table below.

Left: The kit components come in a customizable foam-lined, waterproof case.

Qty	Model	Description	Qty	Model	Description
10	0.5THDN	0.5" Drift nest	1	0.5THV-.4375-1.6875-6MM	0.5" Vector Target
1	0.5TH-12MM-6MM	0.5" Target holder	1	1.5ADP-.5	0.5" to 1.5" SMR Adapter
1	0.5TH-12MM-8MM	0.5" Target holder	1	0.5RH	0.5" SMR handle
1	0.5TH-12MM-10MM	0.5" Target holder	1	BP-25MM	Bar Point
1	0.5TH-12MM-12MM	0.5" Target holder	1	BXT-250MM	250mm Bar extension
1	0.5THE-M-12MM	0.5" Edge Adapter	1	8001-4	1/16" Hex Allen wrench
1	0.5THS-12MM	0.5" Shankless Target Holder			

Specifications

May be used with...

Approx weight: Case and contents, 7 lbs (3.2 kg)

- Any 0.5" SMR

Case: Foam-lined, injection molded, waterproof



1.5LTE-1000MM Low Thermal Expansion Scale Bar

40% Reduction in Thermal Expansion Over Invar

Our **1.5LTE-1000MM** Low Thermal Expansion Length Reference Bar provides a stable length for use during laser tracker or scanner jobs. Its unique design uses specially designed end caps which counteract length changes in the bar due to thermal growth. This provides a virtually constant length through a wide working temperature range. Testing has shown that the 1.5LTE-1000MM has a thermal stability **40% better than invar**.

The target holders on each end are positioned off-axis, and allow 360° rotation of the SMR, adding application flexibility. You can place the reference bar in relevant positions in the measurement volume for scaling, consistency, and stability checks during a job. Or, you can align the bar with your tracker's beam, and use the interferometer alone to compare against the bar's length (with no Az or El encoder contributions to error)



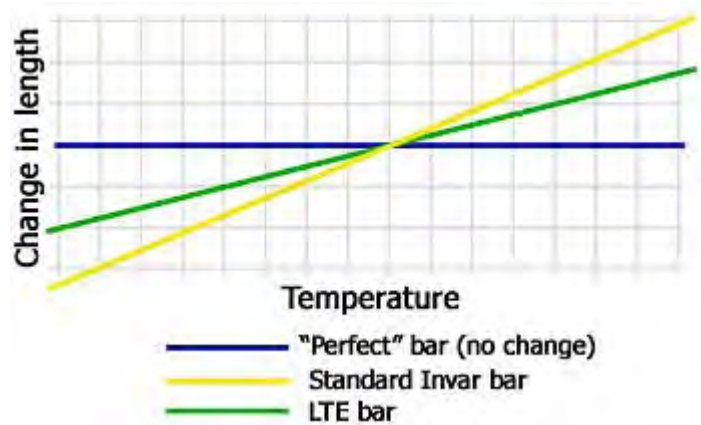
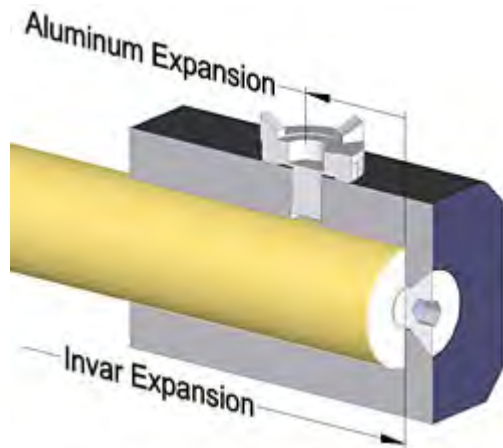
The 1.5LTE-1000MM consists of a single length of invar tubing with two permanently mounted aluminum end caps, each with a 1.5INV magnetic SMR nest (SMRs not included).

This item is available in a 1 meter length (target center to target center). Actual length will be within $\pm 1/32"$ (0.79mm) of 1 meter, but our calibration laboratory will provide a certificate with NIST-traceability indicating the actual length of the assembly within $\pm 0.0001"$ (0.003mm). Patent pending.



How does it work?

The LTE bar maintains a very low coefficient of expansion by virtue of its unique design. Invar, already a very thermally stable material, is used as the main component. Aluminum end caps are permanently mounted to the ends of the invar bar, with an SMR target nest situated inboard from the end of the bar. The bar and the end cap both expand/contract with temperature increases/decreases. However, when the bar lengthens and moves the target nests further apart, the end caps also expand, moving the target nests back together again. The location of the nests is precisely calculated so that the change in invar and changes in the end cap lengths tend to cancel each other out.



Specifications

Length Accuracy: Bar will be within $\pm 1/32$ " (0.79mm) of length requested. However, NIST-traceable certification of actual bar length to ± 0.0001 " (0.003mm).

Main body: Single invar tube with oil and stain resistant PVC jacket.

Case: High impact ABS plastic, with contour-cut foam cushion interior.

End caps: Permanently mounted black anodized aluminum, with fixed 1.51NV SMR target holder.

Weight: bar alone, 3.7 lbs (1.7 kg); bar and case, 9 lbs (4.1kg).

May be used with...

- Any 1.5" SMR



1.5LRB Length Reference Bar

Use an Invar length reference bar with your tracker

Our **1.5LRB** Length Reference Bar provides a NIST-traceable length for use during laser tracker or scanner jobs. Use it to establish system scale when using single measuring instruments or when bundling multiple instruments together. Or use it to verify system accuracy and stability during a measurement job. Many of our customers shoot a length reference bar at the beginning, middle, and end of a job to gain confidence that nothing moved or changed during the shoot.

The 1.5LRB consists of a single length of our Invar tubing outfitted with two permanently mounted, 1.5INV magnetic SMR nests for a 1.5" SMR. (SMRs not included.) Also included are two 15199 Invar system "feet", positionable at your discretion.

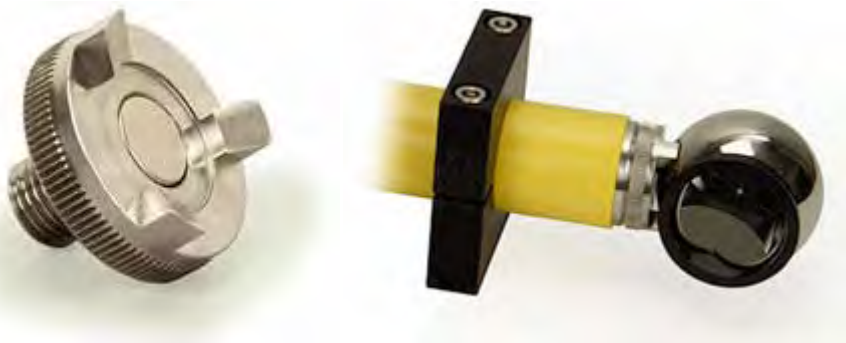


1.5LRB

Deviation in length of 80" reference bar at various temperatures			
Temp °F	Steel	Aluminum	Invar
40°	-0.0180"	-0.0292"	-0.0015"
50°	-0.0116"	-0.0188"	-0.0010"
60°	-0.0052"	-0.0084"	-0.0004"
68° (std. temp)	±0.0000"	±0.0000"	±0.00000"
70°	+0.0012"	+0.0020"	+0.0001"
80°	+0.0076"	+0.0124"	+0.0007"
90°	+0.0140"	+0.0228"	+0.0012"

The 1.5LRB is available in customer-specified lengths, English or metric (90" or 2.3m maximum). Actual length will be within $\pm 1/32"$ (0.8mm) of requested length, but our calibration lab will provide a certificate with NIST-traceability indicating the actual length of the assembly within $\pm 0.0001"$ (0.003mm).

Invar is an excellent material for this application due to its extreme stability over a wide temperature range. Take a look at the table at left to see the stability of Invar reference bars compared with other materials.



Note: If you don't need NIST-traceability of a given dimension, but just require a consistent length for system checks, you may want to build your own reference bar using our Invar system and related targets.

Specifications

Length accuracy: NIST-traceable certification to ± 0.0001 " (0.003mm); length of bar will be within $\pm 1/32$ " (0.79mm) of requested length.

Maximum length: 90" (2.3m)

May be used with...

- Any 1.5" SMR

ООО «Промышленная геодезия»

Поставка высокоточного измерительного оборудования Leica и Romer (Hexagon Metrology, Швейцария),

программного обеспечения Spatial Analyzer (New River Kinematics, США),

прецизионной измерительной оснастки (Brunson Instrument Company, США),

высокоточных лазерных сканеров Surphaser (Basis Software, США, Россия) и программного обеспечения ScanIMAGER, Geomagic, PolyWorks

проекторных лазерных систем LAP Laser (LAP GmbH Laser Applikationen, Германия)

Разработка измерительных технологий, специализированной измерительной оснастки

Обучение персонала, сервисное и методическое сопровождение

Высокоточный размерный контроль крупногабаритных изделий в различных отраслях промышленности

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