BoltShield®

Protect bolts and nuts from damage and corrosion













BoltShield® is an initiative of Tornilastra Srl

For further information please visit our websites www.boltprotection.com - www.tornilastra.it

Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion



What are BoltShield® protection caps?

BoltShield® caps are screw-on metal **caps designed to protect bolts and nuts from thread damage**, and to considerably **help prevent corrosion**.

By using BoltShield caps you will **extend the life of bolts and nuts** and make **maintenance and repair procedures easier and faster**.

This will help to **reduce expensive plant downtimes**, thus saving money and time.

BoltShield caps are widely used in **refineries**, **petrochemical plants**, **LNG plants**, offshore platforms, steel structures. They are commonly installed on heat exchangers, reactors and **process equipment** operating at **temperatures up to 550°** C and over, where common plastic caps would melt. You can find BoltShield caps to protect bolts on **valves**, **pipelines**, traffic sign posts, bridges, **wind turbines** and several other applications where bolts and nuts need to be protected.

BoltShield® metal protection caps have a **special internal female thread**, named Screw-On System, that ensures a strong and secure fixing to the bolt by matching the bolt thread (see How it Works).
BoltShield® are **designed to be installed manually**; no extra tools are required, and they can be easily installed and removed when needed.

We offer **two types of BoltShield® caps** with **different levels of protection**.

Both types of caps are available made of **ALUMINIUM**, **STAINLESS STEEL (304/316)**, **CARBON STEEL**, **ZINC ELECTROPLATED CARBON STEEL** for bolt sizes ranging from **½" to 6"**, M12 to M100.

COATINGS and CUSTOM-MADE CAPS ARE ALSO AVAILABLE !

BoltShield®

Protect bolts and nuts from damage and corrosion

Features:

- **Caps that protect bolts and nuts from thread damage, dirt and corrosion**;
- Special internal thread, named **SCREW-ON SYSTEM**, that ensures a strong and secure fixing to the bolt;
- **Two types of caps available**: TYPE TD caps cover both the exposed bolt threads and the nut, TYPE TR caps cover the exposed bolt threads only;
- Both types can be supplied for bolt **sizes** ranging **from Ø ½" - 6" / M12 - M100;**
- All caps are available for both **imperial and metric thread sizes**
- **TAILOR-MADE caps are available for any application**
- Materials available: **STAINLESS STEEL (304, 316L)** / **ALUMINIUM** / **CARBON STEEL** / **ZINC ELECTROPLATED CARBON STEEL**
- **COATINGS AVAILABLE UPON REQUEST**
- Rated for **temperatures up 550°c (aluminium caps) and over (steel).**



BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

Benefits provided by BoltShield®:

- ✓ **THREAD PROTECTION**
- ✓ **CORROSION PREVENTION**
- ✓ **EXTEND THE LIFE OF BOLTS AND NUTS**
- ✓ **EASIER AND FASTER MAINTENANCE**
- ✓ **LESS TIME SPENT ON REPAIR**
- ✓ **HELP TO REDUCE PLANT DOWNTIMES**
- ✓ **SAVINGS BY OPTING TO AVOID EXPENSIVE COATINGS**
- ✓ **NO NEED FOR TIME-CONSUMING AND MONEY-WASTING DESTRUCTIVE BOLT REMOVAL**

= SAVINGS

There are several reasons for using BoltShield® caps, the two most important being:

1. **THREAD PROTECTION**: BoltShield® caps protect bolts from accidental thread damage that may occur during handling, transportation and maintenance procedures

2. **CORROSION PREVENTION**: BoltShield® considerably helps preventing corrosion on bolts and nuts by covering and sealing them.

Mechanical protection and corrosion prevention translate into **easier and faster maintenance** as the bolt threads won't suffer any damage and will be protected from dirt and corrosion, which would lead to serious problems during maintenance and repair operations.

Think of the inconvenience and the **waste of time that a rusted bolt may cause** during repair, and multiply it by the number of unprotected bolts that you have in your assets: needless to remark how annoying that would be.

With BoltShield® caps, maintenance and repair will be much easier and faster, and this will help to considerably reduce expensive plant downtimes, thus saving money and time.

BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

ASTM B-117 CORROSION TEST (600 hours)



ASTM A193 B7 1" STUD BOLT + gr 2H NUT
EXPOSED TO SALT FOG
(NO BoltShield PROTECTION)

COMPLETELY CORRODED

ASTM A193 B7 1" STUD BOLT + gr 2H NUT
PROTECTED BY BoltShield® TD TYPE CAP

EXCELLENT CONDITIONS
NO EVIDENCE OF CORROSION

ASTM B-117 is an accelerated salt fog test recognized worldwide.

ATM B-117 test was performed **to determine to what extend the use of BoltShield metal caps can help to prevent corrosion on bolts and nuts**.

This test provides a comparison, in terms of corrosion, between bolts and nuts protected by BoltShield caps and unprotected ones. Time of exposure to salt fog: 600 hours.

Several combinations of bolted joints protected with BoltShield caps have been tested. After 600 hours of exposure of the specimens to salt fog, results document that **bolts and nuts protected with BoltShield caps show marginal corrosion only**, as it can be seen from the picture.

At the left: ASTM A193 B7 1" stud bolt + A194 gr 2H nut that remained exposed to salt fog throughout 600 hours. Both the bolt and the nut are **completely corroded**. At the end of the test, it was very difficult to unscrew the nut from the bolt.

At the right: ASTM A193 B7 1" stud bolt + A194 gr 2H nut that were protected by a **BoltShield TYPE TD CAP.** Here you can see that **there is only marginal corrosion.**

The official Test Report along with all photographic attachments, dated May 22nd 2014, released by the technical laboratory that performed the test is available upon request.

BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

TYPE TD – Bolt & Nut Protection Caps

Available in:
ALUMINIUM →up to 4" – M100
STAINLESS STEEL →up to 2" – M52
CARBON STEEL →up to 4" – M100

(carbon steel also available zinc electroplated)



BoltShield® caps TYPE TD offer **the best protection**, as they cover both the exposed bolt threads (size HT of the chart) and the nut (size HD).

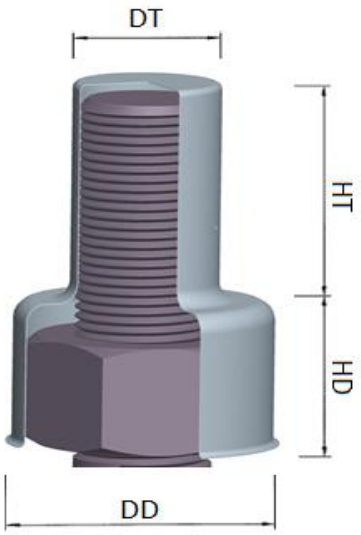
We offer our customers standard sizes (see the chart below), ranging from ½" to 4"**,** M12 to M100, according to the material required.

TYPE TD caps - standard sizes									
Imperial					Metric				
size	DT	DD	HD	HT	size	DT	DD	HD	HT
-	-	-	-	-	M12	12	24	14	18
-	-	-	-	-	M14	14	29	16	20
-	-	-	-	-	M16	16	31	18	22
½"	12.7	27	15	20	M18	18	34	21	23
5/8"	16	34	19	22	M20	20	39	23	25
¾"	19	39	22	23	M22	22	40	25	32
7/8"	22.3	44	26	33	M24	24	45	29	34
1"	25.5	48	29	37	M27	27	51	30	37
1"1/8	28.6	55	33	40	M30	30	55	33	40
1"1/4	31.8	60	36	44	M33	33	61	36	46
1"3/8	35	65	39	48	M36	36	65	39	48
1"1/2	38.2	70	42	53	M39	39	70	42	52
1"5/8	41.3	77	46	59	M42	42	77	46	59
1"3/4	44.5	83	49	64	M45	45	83	49	64
1"7/8	47.7	88	53	67	M48	48	88	53	67
2"	51	94	56	72	M52	52	94	56	72
2"1/4	57.2	105	62	80	M56	56	102	60	84
2"1/2	63.5	114	69	91	M64	64	113	69	91
2"3/4	70	125	75	99	M68	68	119	73	98
3"	76.3	136	81	107	M72	72	125	77	100
3"1/4	82.7	152	87	116	M76	76	131	81	105
3"1/2	89	160	94	126	M80	80	136	85	107
3"3/4	95.4	172	100	135	M90	90	159	95	126
4"	102	183	107	152	M100	100	183	105	144
INTERNAL DIMENSIONS (mm)									

We also provide **custom-made sizes and bespoke solutions for any application**, to meet all customers' needs.

If the sizes indicated in the chart do not fit your requirement, don't worry: we can manufacture a tailor-made BoltShield cap for you!

BoltShield Type TD **are also available to fit bolts with two hex nuts, round nut**, with our without washer.



BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

TYPE TR – Bolt Protection Caps

Available in:
ALUMINIUM →up to 6" – M100
STAINLESS STEEL →up to 2"1/2 – M64
CARBON STEEL →up to 4" – M100

(carbon steel also available zinc electroplated)



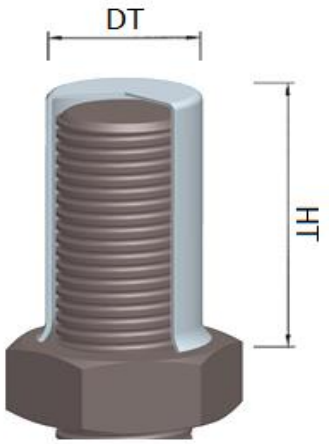
TYPE TR caps - standard sizes					
Imperial			Metric		
size	DT	HT	size	DT	HT
-	-	-	M12	12	18
			M14	14	21
			M16	16	24
½"	12.7	20	M18	18	27
5/8"	16	24	M20	20	30
¾"	19	30	M22	22	33
7/8"	22.3	33	M24	24	36
1"	25.5	38	M27	27	38
1"1/8	28.6	42	M30	30	42
1"1/4	31.8	48	M33	33	48
1"3/8	35	53	M36	36	53
1"1/2	38.2	57	M39	39	57
1"5/8	41.3	62	M42	42	62
1"3/4	44.5	67	M45	45	67
1"7/8	47.7	72	M48	48	72
2"	51	77	M52	52	77
2"1/4	57.2	85	M56	56	85
2"1/2	63.5	94	M64	64	94
2"3/4	70	105	M68	68	105
3"	76.3	114	M72	72	105
3"1/4	82.7	123	M76	76	114
3"1/2	89	133	M80	80	114
3"3/4	95.4	138	M90	90	133
4"	102	151	M100	100	150
4"1/4	108	162			
4"1/2	114.5	172			
4"3/4	121	181			
5"	127.2	190			
5"1/4	133.5	199			
5"1/2	140	207			
5"3/4	146.2	222			
6"	152.5	229			
INTERNAL DIMENSIONS (mm)					

If you are interested in protecting the bolt threads only, BoltShield® caps TYPE TR offer the best thread protection.

They are **designed to protect only the exposed bolt threads** (size HT of the chart below). BoltShield® caps TYPE TR do not cover the nut, which remains exposed.
We offer our customers standard size (see chart), ranging from ½" to 6"**,** M12 to M100**,** according to the material required.

We also provide custom-made sizes and bespoke solutions for any application in order to meet all customers' needs.

If the sizes indicated in the chart do not fit your requirements don't worry:
WE CAN MANUFACTURE TAILOR-MADE PROTECTION CAPS FOR YOU!



BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

Why **BoltShield®** is **cost-effective**?

BoltShield® caps are **cost-effective** not only because they **help to reduce the time, thus the cost, of maintenance operations and plant downtimes**, but also because their use will prominently **extend the life of your bolts and nuts.**

BoltShield® caps are reusable and once tightly fixed onto bolts they will last for years.

Indeed there are other ways to **prevent corrosion**, such as coatings or stainless steel.



However, **coatings are expensive and may not be enough to prevent corrosion**, as during transportation, handling and assembling **they may wear out**. Re-coating is expensive and time-wasting. This will result in unprotected bolts and nuts, which will soon be affected by corrosion.

Stainless steel is clearly a good choice to prevent corrosion, but it **is expensive**.

Last but not least: **coatings and stainless steel CANNOT prevent the bolt threads from accidental damage** that could compromise the integrity of your bolts.



BoltShield® protection caps provide thread protection and corrosion prevention at a cheaper price.

BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

When to use BoltShield® protective caps?

Interested in **SAVING MONEY** while **GUARANTEEING PROTECTION** for your bolts & nuts?

→ **COATINGS** and **STAINLESS STEEL** are **EXPENSIVE** and do not offer protection from thread damage

Do you have **COATED** bolts & nuts in your assets?

→ **COATINGS are SUBJECT TO WEAR & TEAR** and the BOLT THREADS are still AT THE **RISK OF** ACCIDENTAL **DAMAGE**

Do you have **STAINLESS STEEL** bolts & nuts in your assets?

→ The BOLT THREADS are still AT THE **RISK OF** ACCIDENTAL **DAMAGE**

Would you run the risk?

?

BUY BoltShield® caps
they provide

- ✓ THREAD PROTECTION
- ✓ CORROSION PREVENTION
- ✓ SAFETY AT THE JOB SITE

at a cheaper price

BUY CARBON STEEL BoltShield® caps

they're also SUITABLE FOR COATING and you will increase the level of protection for your bolts by adding

- ✓ THREAD PROTECTION
- ✓ SAFETY AT THE JOB SITE

BUY STAINLESS STEEL BoltShield® caps
and you will reach the highest level of protection for your bolts & nuts by adding

- ✓ THREAD PROTECTION
- ✓ SAFETY AT THE JOB SITE



BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

The Screw-On System

BoltShield® caps are designed to be installed manually. They have a **special internal thread**, named Screw-On System, **that ensures a strong and secure fixing**.

No extra tools are required, and caps can be easily installed and removed when needed !

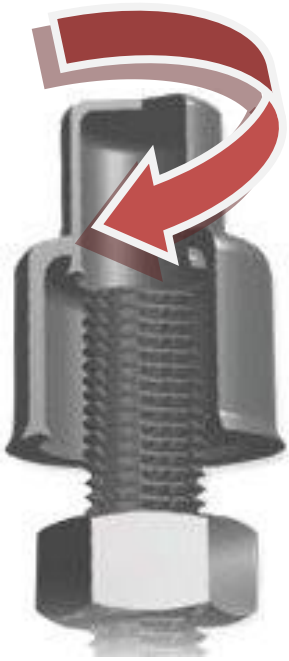
How it works:

The pressure marks which you can see in detail in the pictures are made according to the bolt thread pitch required (all UN and metric ISO threads available).

These marks act as a female thread, by matching the bolt threads. To install BoltShield® you only have to screw the cap onto the bolt like a cap on a bottle (see instructions below).

Once the lip at the bottom of the BoltShield® cap touches the flange (in case of TYPE TD caps) or the nut (in case of TYPE TR caps), the cap will fix. Tighten with your hands and that's it.

Thanks to the Screw-on System, BoltShield® caps will remain fixed and withstand high vibrations.



Visit the section "how it works" on our website for further information..





BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it

BoltShield®

Protect bolts and nuts from damage and corrosion

How to install BoltShield® caps : 3 easy steps

1

Clean the bolt thread from dirt very carefully and apply grease.

2

Place the BoltShield® cap onto the bolt being sure that the pressure marks of the Screw-on System perfectly lean against the bolt threads to match them.

3

Screw till the bottom lip of the BoltShield® cap touches the flange or the nut, depending on the type of cap to install, and tighten with your hands.



News:



Caps with grease nipple available

Hydraulic 1/4" gas UNI 7663 A
Steel AVP 11 SmPb37 - UNI EN 10204
Treatment: white zinc (7 micron)





New line of BoltShield caps to fit wind turbines foundation anchor bolts coming soon.

BoltShield® is an initiative of Tornilastra Srl
For further information please visit our websites www.boltprotection.com - www.tornilastra.it
Phone: +39.035.41.56.278 Fax: +39.035.61.57.21 Email: boltshield@tornilastra.it