



BOLT ARMOUR

PROTECT YOUR BOLTS

CORPORATE PROFILE

Bolt Armour®

Bolt Armour® is a line of metallic caps designed to prevent corrosion and damage on all types of industrial bolts.

Corrosion and accidental damage are common issues that put the integrity of bolted connections at danger.

Corrosion, especially SCC and crevice, affects the largest part of carbon and low-alloy steel bolts and nuts. Conventional solutions to prevent this widespread phenomenon on fasteners imply the use of stainless steel or coating. Unfortunately, both options are not only expensive, but often also prove to be ineffective: the combination of tensile stress with a high-corrosive environment can crack stainless steel and generate what we call Chloride Stress Corrosion Cracking. Coatings, instead, are often subject to wear-and-tear and possible removal as a result of poor handling or during assembly and maintenance.

Most importantly, neither the use of stainless steel nor that of coatings can prevent accidental thread damage on bolts.

Every rusted bolt becomes an issue anytime, due to corrosion or thread damage, unfastening is complicated (or impossible) and there is no solution but to rely on destructive disassembly procedures. All this contributes to slow down maintenance operations and so to increase plant downtimes, with a considerable loss of time and money.

Bolt Armour® caps are the solution to preserve the integrity of your bolted connections!

Bolt Armour® will protect your bolts and nuts against damage and corrosion, and will contribute to extend their service life! Bolt Armour are easy to install and remove, and they are available in several materials and tailor-made solutions to fit your application!

Contact us today and talk to our team!

We're here to help you solve your problem!

GENERAL FEATURES

PREVENT CORROSION AND DAMAGE ON BOLTS AND NUTS

EASY TO INSTALL (SCREW ON)

IMPROVE SAFETY

EXTEND THE LIFE OF BOLTS AND NUTS

SPEED UP MAINTENANCE AND REDUCE PLANT DOWNTIME



NO MORE CORRODED BOLTS



COMMON ISSUES ON BOLTS



CORROSION

Corrosion (SCC, crevice, galvanic) is the foremost contributor of fasteners failures especially for carbon and low alloy steel.

MECHANICAL DAMAGE

Bolt threads are often at the risk of accidental damage which can compromise the integrity and the performance of the bolted connection.



CONSEQUENCES



MONEY LOSS AND SAFETY THREAT

Unfastening becomes impossible on rusted or damaged bolts; destructive disassembly is therefore needed. Maintenance time and costs increase a big deal. Operators safety and asset integrity are at danger.

CONVENTIONAL (INEFFECTIVE) SOLUTIONS



STAINLESS STEEL

Stainless steel fasteners are very expensive and yet may suffer from Chloride Stress Corrosion Cracking and thread damage.

PLASTIC CAPS

Plastic caps are fragile, easy to damage and often non UV resistance.
Conventional LDPE caps only withstand 70°C max. continuous temperature.



COATINGS

Coatings are used to avoid corrosion but they suffer from wear&tear and deterioration. Coating processes pose risks to workers and can be hazardous for the environment.

Bolt Armour®: your definitive solution

BA T-PRO



Bolt Armour® BA T-PRO caps are designed to protect the exposed bolt threads.



BA F-PRO



Bolt Armour® BA F-PRO caps are designed to protect both the exposed bolt threads and the nut.



COATINGS AVAILABLE

Bolt Armour® caps are metal-made and suitable for coatings.

Coatings are a great solution to improve corrosion resistance of the caps, especially when exposed to harsh and high-corrosive environments.

Amongst the most common coatings, it is worth mentioning anodizing on aluminium caps, fluoropolymer coating on carbon steel (a perfect fit for protect fluoropolymer coated stud bolts), and zinc plated carbon steel.

Epoxy and painting are also available.



Bolt Armour® available materials.

ALUMINIUM

With a density of approximately 30% that of steel, aluminium is a light material well known for its longevity and suitable for several applications, from cryogenic to marine.

Aluminium shows an impressive resistance to weathering and to corrosion under several service conditions. When exposed to atmospheric agents, aluminium forms a thin oxide layer which protects the core part from further oxidation. Its corrosion prevention properties, can be consistently increased with passivation (anodizing).

STAINLESS STEEL

SS304 and SS316 caps are recommended for application on stainless steel bolts (e.g. SS304 for ASTM A193 B8 bolts, SS316 for ASTM A193 B8M bolts) and its common applications are refining, chemical processing and marine.

Austenitic stainless steels are often selected to endure corrosive environments and boast an outstanding corrosion resistance.

CARBON STEEL

Carbon steel caps are a good option for applications where high temperatures do not allow the use of aluminium caps, or when a more robust and heavier protector cap is needed. Carbon steel are also a suitable choice to protect coated stud bolts and nuts.

We can offer several coatings to our carbon steel caps (zinc, fluoropolymer-based, epoxy etc.)

PROTECT YOUR BOLT.



SIZE SELECTION

Bolt Armour® caps are available for both imperial (up to 6") and metric (up to M100) and imperial bolts, and for both UNC, UNF, coarse and fine pitches.

Besides standard dimension caps, we can offer tailor-made solutions to fit the most demanding applications.

Selecting the right cap for your application is paramount! Contact our team to get your solution today.

Available materials:
Aluminium
Carbon steel
Zinc plated carbon steel
Stainless steel (304/316)

Available sizes:
From 1/2" to 6", M12 to M100
Customized solutions available.



Bolt Armour® application fields.



BOLT ARMOUR® CAPS ARE USED IN REFINERIES, PETROCHEMICAL PLANTS, LNG PLANTS, OFFSHORE PLATFORMS, STEEL STRUCTURES, ROADS, HEAT EXCHANGER, WIND TURBINES, POWER PLANTS.

How Bolt Armour® prevents corrosion

When preserving the integrity of a bolted connection, we almost always have to face corrosion.

Such widespread phenomenon is likely to affect bolts and nuts basically in any type of environment, from desertic areas to offshore platforms, and service application and, most importantly, it has to be said that corrosion can be limited and delayed, but it's impossible to eliminate.

The equation is simple: where there is steel, there is corrosion. Corrosion on fasteners is a serious threat to the whole asset integrity and could eventually lead to a failure.

Stainless steel and coatings can be (expensive) options to reduce corrosion. Some coatings can also be effective in preventing galvanic action between dissimilar metals.

Bolt Armour® caps are an effective means to help preventing and fighting corrosion. To this regards, the combination of Bolt Armour® with a good paste/anti-seize compound is proved to be very effective.

It is very important to select a good paste/grease with corrosion inhibitor in its composition and low coefficients of friction. There are several valid products available in the market that are commonly utilized on bolted connections to reduce friction, galling and wear during assembly and maintenance, and that also offer good corrosion protection. Please contact our team to help you selecting the right product for your application.

We strongly recommend to evenly apply the paste/grease to the bolt and nut prior to installing Bolt Armour®.

Sealing can be further improved by using a silicon (or rubber) washer to be placed around the nut in between the flange and the bottom part of the cap.

Our team of experts will help you find the best solution to protect your bolted connections!

CASE HISTORY

During winter service vehicles and snow removal trucks are in action to spread salt along the road to prevent ice formation.

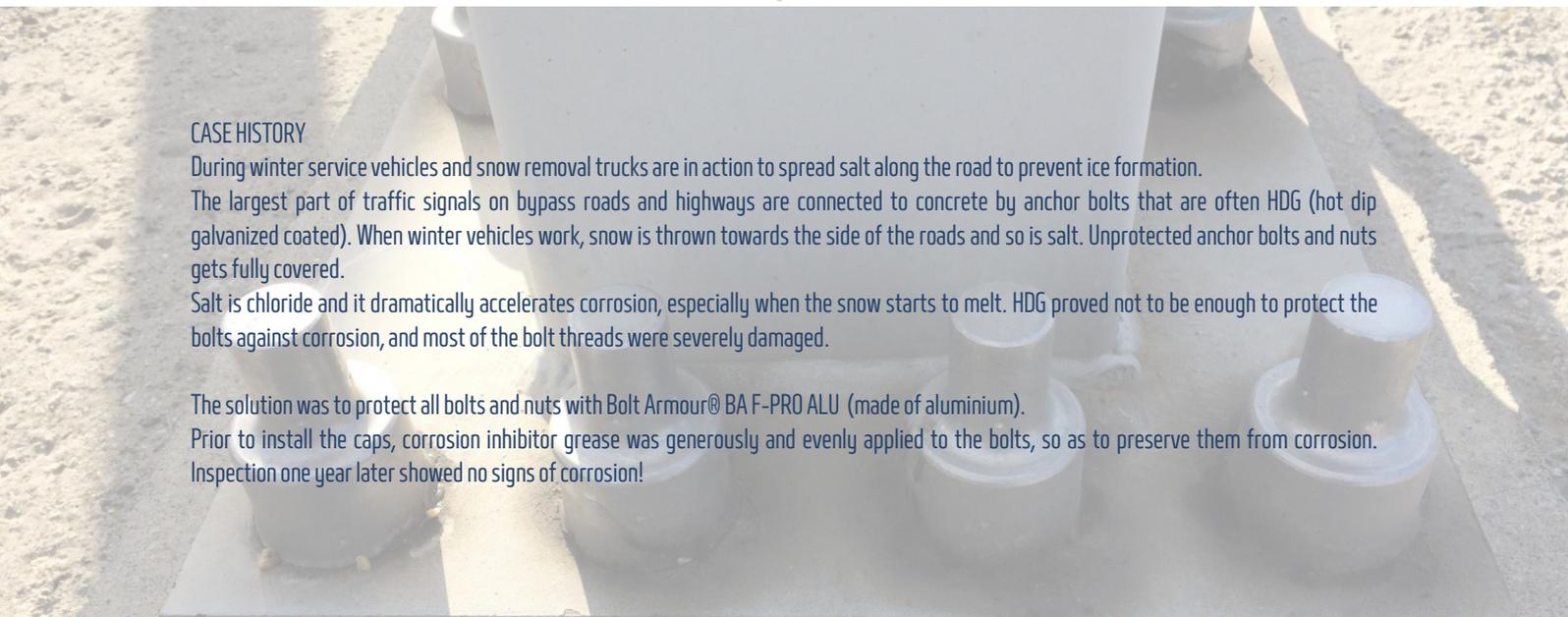
The largest part of traffic signals on bypass roads and highways are connected to concrete by anchor bolts that are often HDG (hot dip galvanized coated). When winter vehicles work, snow is thrown towards the side of the roads and so is salt. Unprotected anchor bolts and nuts gets fully covered.

Salt is chloride and it dramatically accelerates corrosion, especially when the snow starts to melt. HDG proved not to be enough to protect the bolts against corrosion, and most of the bolt threads were severely damaged.

The solution was to protect all bolts and nuts with Bolt Armour® BA F-PRO ALU (made of aluminium).

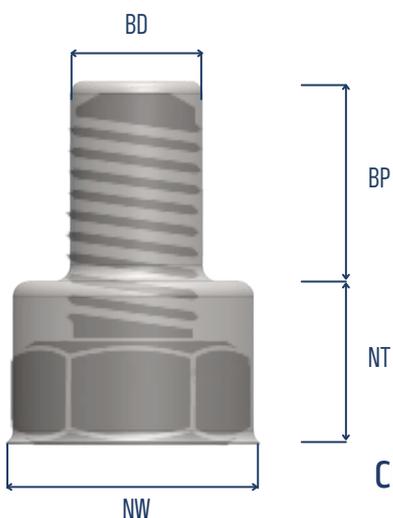
Prior to install the caps, corrosion inhibitor grease was generously and evenly applied to the bolts, so as to preserve them from corrosion.

Inspection one year later showed no signs of corrosion!



Bolt Armour® sizes*

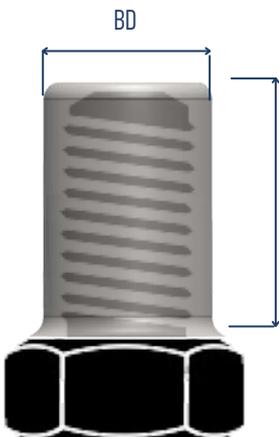
BA F-PRO STANDARD SIZE									
IMPERIAL					METRIC				
SIZE	BD	NW	NT	BP	SIZE	BD	NW	NT	BP
-	-	-	-	-	M12	12,2	24,2	14,0	18,0
-	-	-	-	-	M14	14,2	28,7	16,0	21,0
-	-	-	-	-	M16	16,2	32,0	18,0	24,0
1/2"	12,9	27,0	15,0	20,0	M18	18,2	35,2	21,0	27,0
5/8"	16,1	34,0	19,0	22,0	M20	20,2	38,4	24,0	30,0
3/4"	19,3	39,0	22,0	23,0	M22	22,2	40,2	26,0	33,0
7/8"	22,7	44,5	26,0	33,0	M24	24,2	44,5	29,0	36,0
1"	25,7	48,2	30,0	39,0	M27	27,2	51,2	31,0	40,0
1.1/8"	28,7	57,4	34,0	43,5	M30	30,2	57,4	34,0	45,0
1.1/4"	32,0	60,2	39,0	45,0	M33	33,2	60,2	38,0	50,0
1.3/8"	35,2	68,2	42,0	51,5	M36	36,2	70,2	41,0	54,0
1.1/2"	38,4	70,2	45,0	56,0	M39	39,2	70,2	45,0	59,0
1.5/8"	41,7	76,5	49,0	61,0	M42	42,2	76,5	49,0	63,0
1.3/4"	44,7	82,8	54,0	64,5	M45	45,2	82,8	54,0	68,0
1.7/8"	47,9	89,2	57,0	69,0	M48	48,2	89,2	57,0	72,0
2"	51,2	95,6	60,0	73,5	M52	52,2	95,6	60,0	78,0
2.1/4"	57,4	115,2	68,0	81,5	M56	56,2	102,2	66,0	84,0
2.1/2"	63,7	115,2	74,0	93,0	M64	64,2	115,2	75,0	96,0
2.3/4"	70,2	125,3	81,0	101,0	M68	68,2	120,0	79,0	102,0
3"	76,5	136,0	90,0	109,5	M72	72,2	125,3	82,0	108,0
3.1/4"	82,8	148,2	97,0	117,5	M76	76,2	136,0	89,0	114,0
3.1/2"	89,2	160,3	104,0	133,0	M80	80,2	136,0	91,0	120,0
3.3/4"	95,6	172,2	110,0	149,5	M90	90,2	160,0	105,0	135,0
4"	102,2	183,2	116,0	150,5	M100	100,2	183,0	112,0	150,0



*Internal dimensions in mm,
customized solutions available upon request.

Bolt Armour® sizes*

BA T-PRO STANDARD SIZE					
IMPERIAL			METRIC		
SIZE	BD	BP	SIZE	BD	BP
-	-	-	M12	12,20	18,00
-	-	-	M14	14,20	21,00
-	-	-	M16	16,20	24,00
-	-	-	M18	18,20	27,00
-	-	-	M20	20,20	30,00
-	-	-	M22	22,20	33,00
-	-	-	M24	24,20	36,00
1"	25,70	40,00	M27	27,20	40,00
1.1/8"	28,70	45,00	M30	30,20	45,00
1.1/4"	32,00	50,00	M33	33,20	50,00
1.3/8"	35,20	55,00	M36	36,20	54,00
1.1/2"	38,40	60,00	M39	39,20	59,00
1.5/8"	41,50	65,00	M42	42,20	63,00
1.3/4"	44,70	70,00	M45	45,20	68,00
1.7/8"	47,90	75,00	M48	48,20	72,00
2"	51,20	80,00	M52	52,20	78,00
2.1/4"	57,40	90,00	M56	56,20	84,00
2.1/2"	63,70	100,00	M64	64,20	96,00
2.3/4"	70,20	110,00	M68	68,20	102,00
3"	76,50	120,00	M72	72,20	108,00
3.1/4"	82,80	130,00	M76	76,20	114,00
3.1/2"	89,20	140,00	M80	80,20	120,00
3.3/4"	95,60	145,00	M90	90,20	135,00
4"	102,2	150	M100	100,2	150



*Internal dimensions in mm,
customized solutions available upon request.

ABOUT US

We are a team of expert professionals with a solid background in the oil&gas industry.

Throughout the years we have successfully developed tailor made solutions for fasteners and sealing applications with satisfied customers all over the world.

Our expertise lies in corrosion prevention for critical bolted joints, flanged connections and structural anchoring systems.

We can assist you with technical support for any demanding application where bolted connections need to be protected from corrosion and damage.

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