

SmartBolts®

Visual Indication System

PRODUCT CATALOG



How do you **know** your critical bolts are doing their job?



Take the **doubt** out of bolting with **SmartBolts®**.



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Stress Indicators, Inc. is a privately owned engineering and manufacturing company based in Gaithersburg, Maryland. We provide safe, effective and innovative bolting solutions for our customers worldwide.

Stress Indicators, Inc. invented and developed SmartBolts® technology and commercialized the product to enable broad industry acceptance. All SmartBolts® are manufactured from quality fastener products at our Gaithersburg, MD facility.



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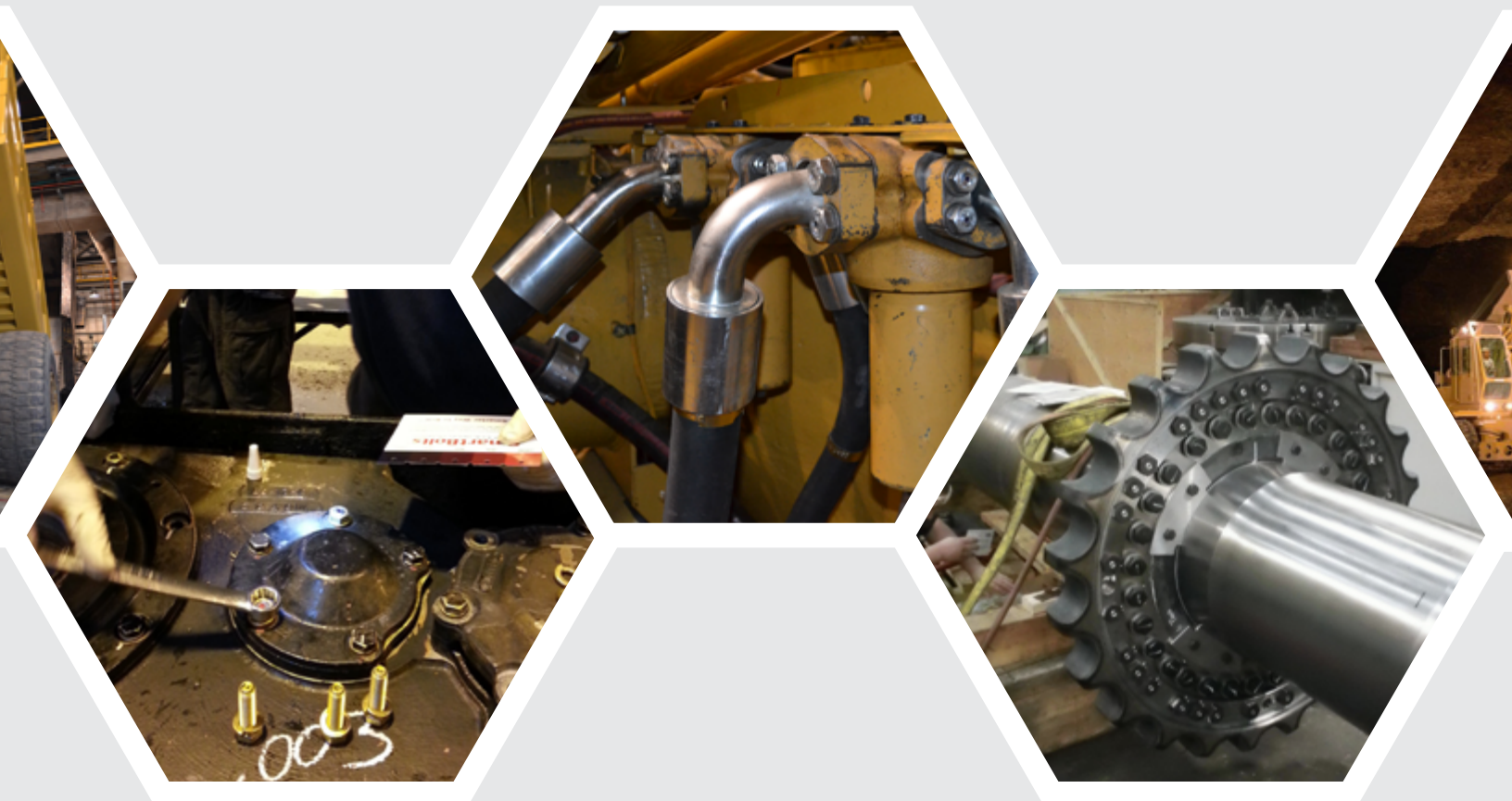
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I. GETTING STARTED

SmartBolts® Technology

SmartBolts® technology enables users to visually check that critical bolts are properly tightened. The technology accurately displays bolt tension (and thereby joint clamp force) by measuring the elongation of the bolt and converting that into a visual indication. SmartBolts® show bolt tension in real time, are fully re-usable, and will provide a visual alert in case of loss of tension.

SmartBolts® provides a Visual Indication System™ that shows that your critical bolts are properly tensioned and that you are ready to press the START button on your process.

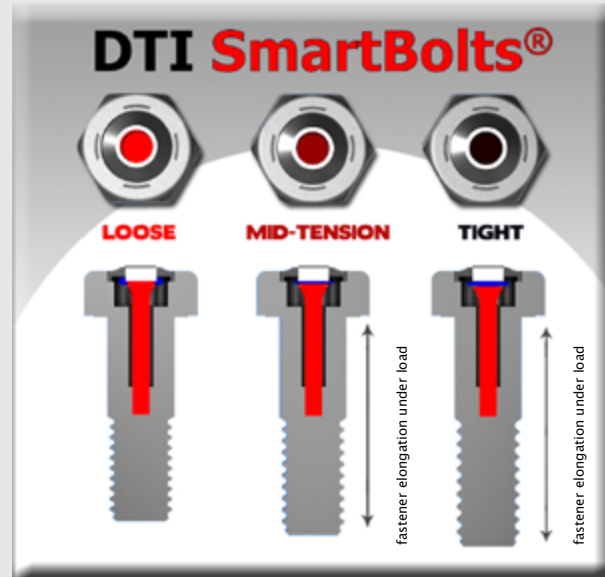


I. GETTING STARTED

DTI SmartBolts®

DTI (Direct Tension Indicating) SmartBolts are specialty fasteners with a built-in indicator that shows the tension that is developed as the bolt is installed.

The indicator gradually darkens from bright red to black as the fastener is tightened.



DTI SmartBolts® Specifications

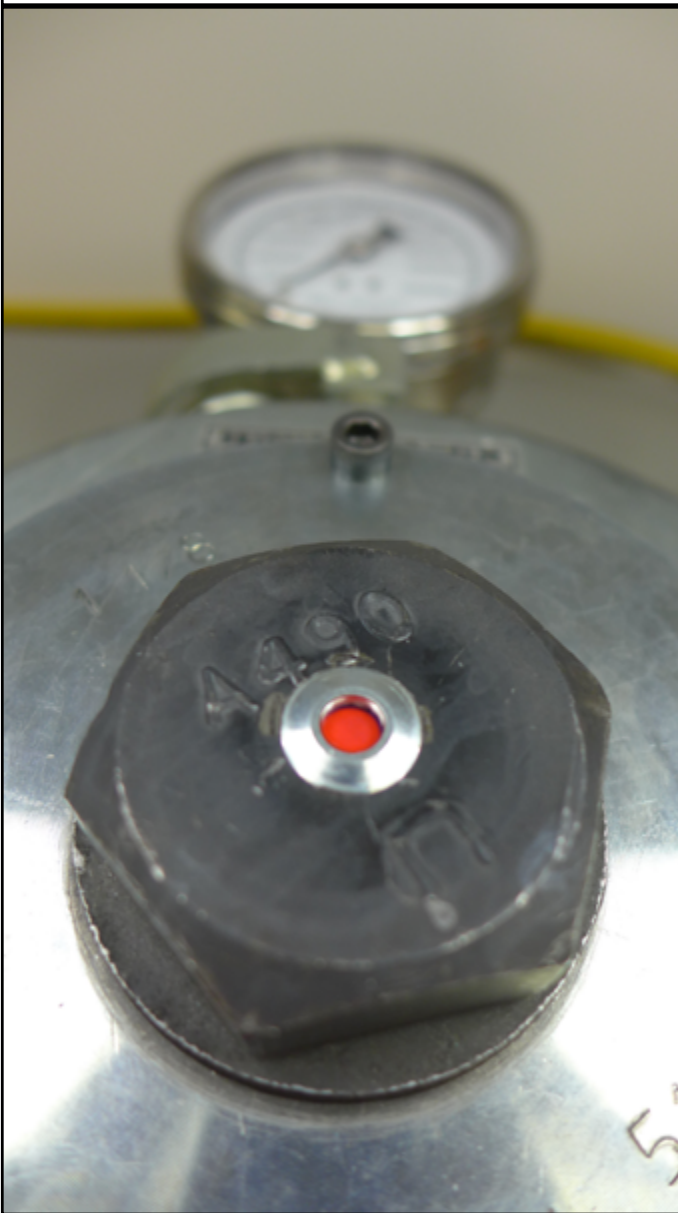
Size Range (Hex Head Cap Screws)	7/16" (M10) to 1-1/2" (M36)
Length Range	1-1/4" (30mm) to 16" (400mm)
Available Grades	Grade 5 (Class 8.8), Grade 8 (Class 10.9) Other grades available upon request
Available Finishes	Plain, Clear Zinc, Yellow Zinc Other finishes available upon request
Threading	Partial or Full
Grip Lengths	Minimums apply for fully threaded bolts
Design Tension Range	30-90% of Proof Load
Accuracy	+/-10% of Design Tension
Operating Temperature Range	-4°F (-20°C) to 168°F (75°C)

I. GETTING STARTED

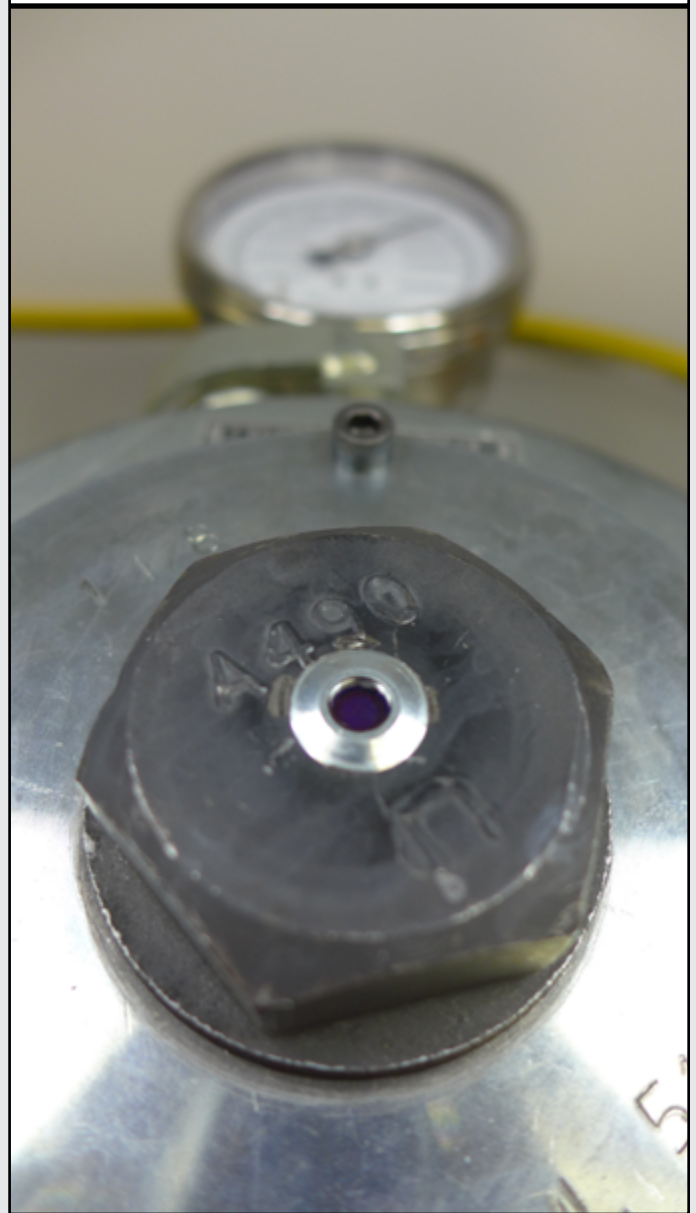
DTI SmartBolts®

DTI SmartBolts have the same form and function as the bolts you are using now. Replacing them is simply a matter of removing the ordinary bolt and installing the matching DTI SmartBolt. Tighten until the indicator turns black and you are ready to go!

DTI SmartBolt at zero tension.



DTI SmartBolt at Design Tension.



I. GETTING STARTED

DTI SmartBolts®

DTI SmartBolts are especially useful in the following situations:

- ✓ If you need to **reduce the costs** of your bolted joint tightening procedure and post-installation bolted joint inspection
- ✓ If your bolts have a **torque specification**
- ✓ If bolts need to be **loosened and re-tightened** frequently
- ✓ If you want to **inspect without touching the bolts**
- ✓ If you want to **simplify maintenance** for equipment operators
- ✓ If you need a **visual audit check** that bolts were properly installed
- ✓ If **accurate bolted joint clamp force** is critical to your application
- ✓ If **variable friction factors** make torque measurement inadequate
- ✓ If you want to **substitute expensive torque wrenches** with ordinary wrenches
- ✓ When **user safety** depends on your bolts being tight



I. GETTING STARTED

DTI SmartBolts®

Pre-Engineered Configuration

Pre-Engineered DTI SmartBolts® are often available directly from inventory. We offer quick lead times and reduced pricing for all Pre-Engineered products.

FASTENER HEAD TYPE

Pre-Engineered DTI SmartBolts are only available as hex head cap screws.

SHANK DIAMETERS

Shank diameters range from 7/16" (M10) to 1-1/2" (M36).

SHANK LENGTHS

Shank lengths range from 1.25" (30mm) to 12" (300mm). Available lengths will vary based on the diameter.

THREAD TYPE

Threads are coarse (UNC) only.

THREAD LENGTH

Thread lengths are partial unless otherwise noted.

MATERIAL GRADES

Grade 5 (Class 8.8) and Grade 8 (Class 10.9) are available in all diameters.

MATERIAL FINISHES

Grade 5 (Class 8.8) bolts up to 3/4" (M20) feature a Clear Zinc finish. Grade 8 (Class 10.9) bolts up to 3/4" (M20) feature a Yellow Zinc finish. Larger bolts feature a Plain finish and will be supplied with our Protective Recess.



DESIGN TENSION

All Pre-Engineered DTI SmartBolts are designed to indicate "Tight" at 70% of the bolt's Modified Proof Strength*. This tension level is appropriate for many applications.

*Modified Proof Strength is the proof strength of the bolt after conversion into a DTI SmartBolt. In all but the shortest bolt lengths, Modified Proof Strength is identical to the original bolt proof strength.

I. GETTING STARTED

DTI SmartBolts®

Custom Engineered Configuration

If you have requirements that fall outside of the Pre-Engineered line offered in this catalog, you may submit a [Product Request Form](#) specifying your requirements for Custom Engineered DTI SmartBolts®.

The following are examples of Custom Engineered DTI SmartBolt options we can design and manufacture to meet your specific requirements:

BOLT TYPES

Do you need a Heavy Hex Head Bolt? A double-ended stud? We convert many bolt types other than Hex Head Cap Screws. We can even convert Socket Head Cap Screws greater than 1" in diameter (M24).

THREAD TYPES, LENGTHS AND DIAMETERS

Fully threaded, fine threaded, triple-lead, custom thread lengths, we do it all! We can convert bolts of greater length and diameter than are listed in this catalog – contact us with your requirements.

CUSTOM DESIGN TENSIONS

We can create a custom design meeting your application requirements with an indicating tension ranging from 30% to 90% of modified proof strength.



Studs



Flange Bolts



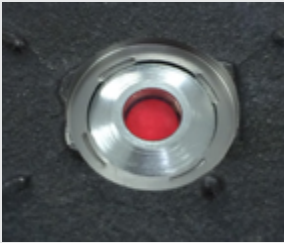
Socket Head Cap Screws

I. GETTING STARTED

DTI SmartBolts®

Custom Engineered Configuration

These features can be added to your Custom Engineered DTI SmartBolts®. Select the features you want in our [Product Request Form](#) and we will respond with a custom design and quotation.



PROTECTIVE RECESS

The Protective Recess design counterbores the indicator into the head of the bolt to protect it from impact. While this catalog offers the Protective Recess in bolts 7/8" (M22) and larger, it is also available on many other DTI SmartBolts diameters and models.



CONTAMINATION SEAL

The Contamination Seal is a popular option which can be added with the Protective Recess. It features a clear, flush epoxy seal which encapsulates the indicator and offers a wipe-clean surface beneficial for environments where the bolts will be exposed to grease, mud, fluids or dust.



RETRO-REFLECTIVE INDICATOR

The Retro-reflective Indicator is appropriate for DTI SmartBolts which will be examined with a head-mounted lamp, such as underground mining operations. The indicator features "stop-sign red" loose indication which shines directly back at the light source.



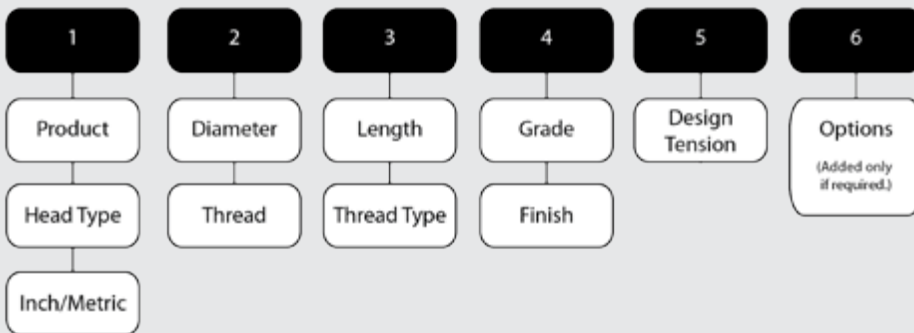
MADE IN USA BOLT

All DTI SmartBolts are "Made in USA" from US components. In some cases, however, the bolt we start with has been manufactured overseas. If customers require, we can often source a bolt that has been manufactured in the USA. In this case you will get a 100% Made in USA product that starts with a quality US-made bolt.

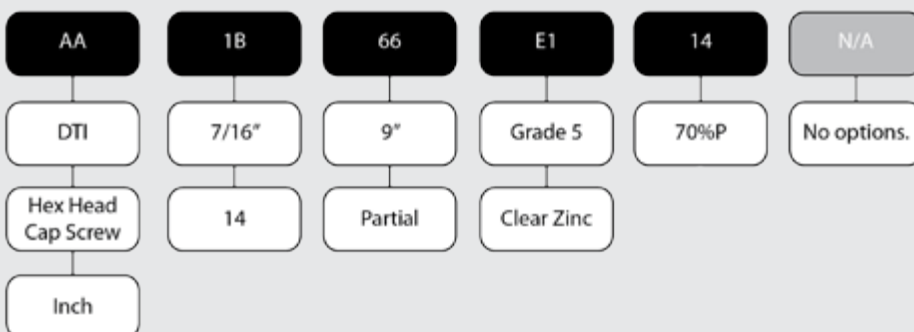
II. HOW TO ORDER

SmartBolts® Part Number

We maintain a system of thousands of product configurations – each one assigned a unique Part Number. The Part Number is used to identify these configurations based on a number of essential features and condenses a long, detailed description into 10-characters.



The SmartBolts® Part Number contains six sections. Each section contains product information that is represented by a two-character alpha-numeric code.



Here is the breakdown of an actual SmartBolts® Part Number (AA1B66E114). It is a Pre-Engineered DTI SmartBolt that is listed in this catalog (pg. 15).

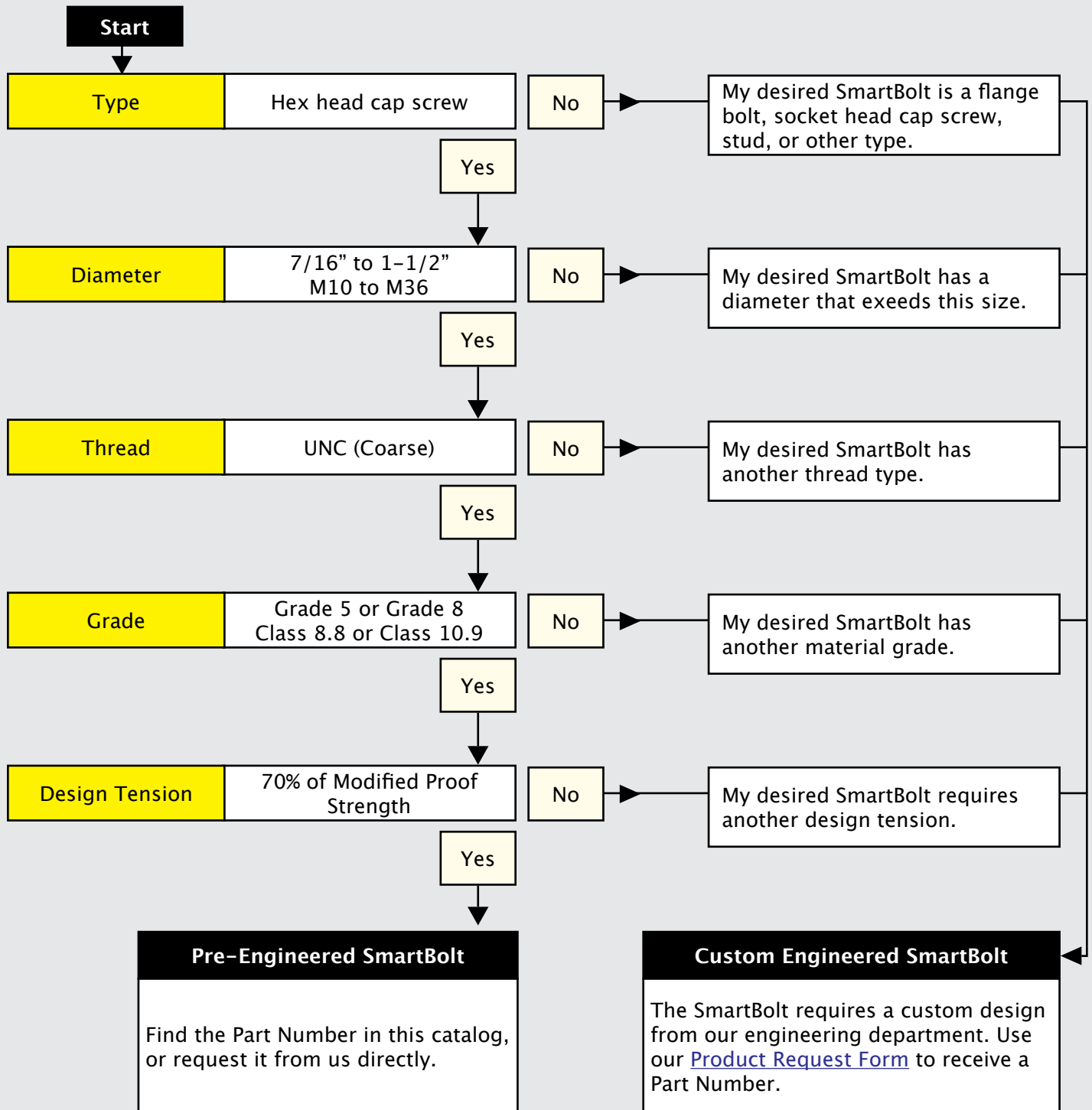
Part Number
AA1B66E114

Pre-Engineered DTI SmartBolts and their associated Part Numbers are listed in this catalog. Custom Engineered DTI SmartBolts require confirmation of product configuration before a Part Number is supplied.

II. HOW TO ORDER

Finding Your SmartBolts® Part Number

If you know the dimensions and general specifications of your desired SmartBolt, use this chart to identify whether it is a **Pre-Engineered** or a **Custom Engineered** product, and how to find your Part Number. Then, follow the instructions on the next page to order your product.



II. HOW TO ORDER

Requesting a Quotation

Placing a SmartBolts® order is a simple three-step process.

STEP 1: Provide Your SmartBolts® Part Number

Use the chart on the previous page to determine whether your SmartBolts® Part Number is listed in this catalog or if you need to request a Part Number.



smartbolts.com/quote

+1 (240) 631-7246



sales@smartbolts.com

STEP 2: Receive Quotation

We will process your request. If additional information is required, one of our representatives will contact you within one business day.

Quotations are often prepared in 1-2 business days. Please allow up to one week if you are submitting a Product Request Form for Custom Engineered DTI SmartBolts®.

STEP 3: Review & Purchase

Quotations are e-mailed to the contact address supplied in Step 1. Review your quotation and follow the instructions included to place an order.

Need assistance? Call us at +1 (240) 631-7246 and we'll help get you started.

III. PRODUCTS

Pre-Engineered DTI SmartBolts®

The **Products** section lists the Part Numbers and specifications for Pre-Engineered DTI SmartBolts®.

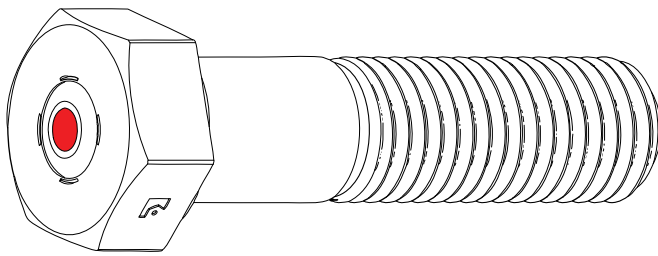


III. PRODUCTS

DTI SmartBolts®

7/16"-14

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 7/16"
THREAD SIZE: 14
GRADE: 5
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
-----------------	-----------------------	-----------------------------------	--------------------------	-------------

1.25 ††	4.8	7	10	AA1BK1E114
1.5 ††	4.8	7	10	AA1BP1E114
1.75 ‡	4.8	7	10	AA1BV1E114
2 ‡	5.5	7.8	11	AA1B42E114
2.25	5.5	7.8	11	AA1B82E114
2.5	6.2	9	12.7	AA1BG2E114
2.75	6.2	9	12.7	AA1BK2E114
3	6.2	9	12.7	AA1BQ2E114
3.25	6.2	9	12.7	AA1BW2E114
3.5	6.2	9	12.7	AA1B33E114
3.75	6.2	9	12.7	AA1B93E114
4	6.2	9	12.7	AA1BF3E114
4.25	6.2	9	12.7	AA1BM3E114
4.5	6.2	9	12.7	AA1BR3E114
4.75	6.2	9	12.7	AA1BX3E114
5	6.2	9	12.7	AA1B44E114
5.5	6.2	9	12.7	AA1BG4E114
6	6.2	9	12.7	AA1BS4E114
6.5	6.2	9	12.7	AA1B55E114
7	6.2	9	12.7	AA1BH5E114
7.5	6.2	9	12.7	AA1BT5E114
8	6.2	9	12.7	AA1B66E114

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

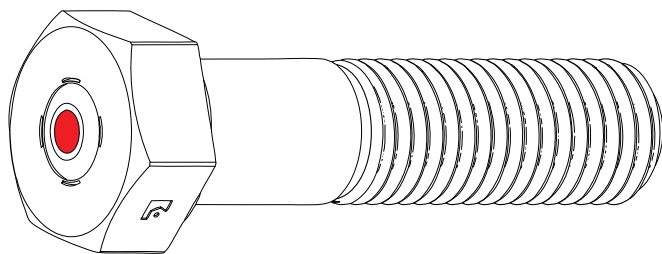
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

7/16"-14

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 7/16"
THREAD SIZE: 14
GRADE: 8
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
-----------------	-----------------------	-----------------------------------	--------------------------	-------------

1.25 ††	6.8	9.9	12.4	AA1BK1R114
1.5 ††	6.8	9.9	12.4	AA1BP1R114
1.75 ‡	6.8	9.9	12.4	AA1BV1R114
2 ‡	7.6	11	13.8	AA1B42R114
2.25 ‡	7.6	11	13.8	AA1B82R114
2.5	8.8	12.7	15.9	AA1BG2R114
2.75	8.8	12.7	15.9	AA1BK2R114
3	8.8	12.7	15.9	AA1BQ2R114
3.25	8.8	12.7	15.9	AA1BW2R114
3.5	8.8	12.7	15.9	AA1B33R114
3.75	8.8	12.7	15.9	AA1B93R114
4	8.8	12.7	15.9	AA1BF3R114
4.25	8.8	12.7	15.9	AA1BM3R114
4.5	8.8	12.7	15.9	AA1BR3R114
4.75	8.8	12.7	15.9	AA1BX3R114
5	8.8	12.7	15.9	AA1B44R114
5.5	8.8	12.7	15.9	AA1BG4R114
6	8.8	12.7	15.9	AA1BS4R114
6.5	8.8	12.7	15.9	AA1B55R114
7	8.8	12.7	15.9	AA1BH5R114
7.5	8.8	12.7	15.9	AA1BT5R114
8	8.8	12.7	15.9	AA1B66R114

NOTE:

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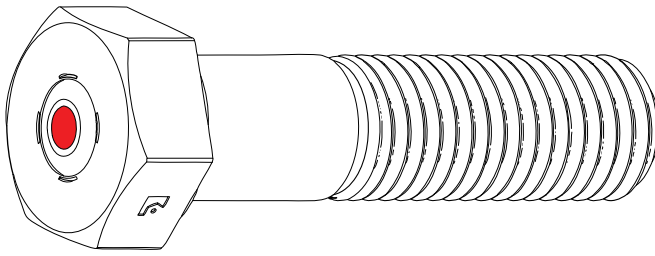
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III. PRODUCTS

DTI SmartBolts®

1/2"-13

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 1/2"
THREAD SIZE: 13
GRADE: 5
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
-----------------	-----------------------	-----------------------------------	--------------------------	-------------

1.25 ††	7	10	14.1	AA4BK1E114
1.5 ††	7	10	14.1	AA4BP1E114
1.75 ††	7	10	14.1	AA4BW1E114
2 ‡	7.5	10.7	15.2	AA4B42E114
2.25 ‡	7.5	10.7	15.2	AA4B82E114
2.5 ‡	8.2	11.9	16.9	AA4BG2E114
2.75 ‡	8.2	11.9	16.9	AA4BK2E114
3	8.2	11.9	16.9	AA4BQ2E114
3.25	8.2	11.9	16.9	AA4BW2E114
3.5	8.2	11.9	16.9	AA4B33E114
3.75	8.2	11.9	16.9	AA4B93E114
4	8.2	11.9	16.9	AA4BF3E114
4.25	8.2	11.9	16.9	AA4BM3E114
4.5	8.2	11.9	16.9	AA4BR3E114
4.75	8.2	11.9	16.9	AA4BX3E114
5	8.2	11.9	16.9	AA4B44E114
5.5	8.2	11.9	16.9	AA4BG4E114
6	8.2	11.9	16.9	AA4BS4E114
6.5	8.2	11.9	16.9	AA4B55E114
7	8.2	11.9	16.9	AA4BH5E114
7.5	8.2	11.9	16.9	AA4BT5E114
8	8.2	11.9	16.9	AA4B66E114

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

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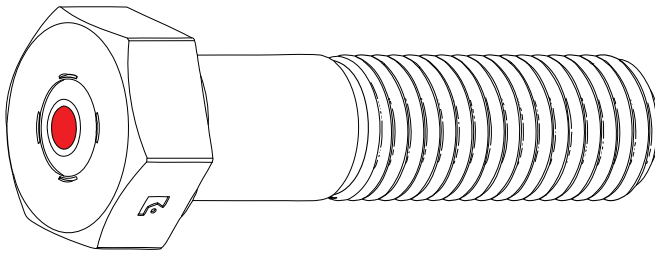
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

1/2"-13

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 1/2"
THREAD SIZE: 13
GRADE: 8
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
-----------------	-----------------------	-----------------------------------	--------------------------	-------------

1.25 ††	9.8	14.1	17.7	AA4BK1R114
1.5 ††	9.8	14.1	17.7	AA4BP1R114
1.75 ††	9.8	14.1	17.7	AA4BW1R114
2 ‡	10.5	15.2	19	AA4B42R114
2.25 ‡	10.5	15.2	19	AA4B82R114
2.5 ‡	12	16.9	21.1	AA4BG2R114
2.75 ‡	12	16.9	21.1	AA4BK2R114
3	12	16.9	21.1	AA4BQ2R114
3.25	12	16.9	21.1	AA4BW2R114
3.5	12	16.9	21.1	AA4B33R114
3.75	12	16.9	21.1	AA4B93R114
4	12	16.9	21.1	AA4BF3R114
4.25	12	16.9	21.1	AA4BM3R114
4.5	12	16.9	21.1	AA4BR3R114
4.75	12	16.9	21.1	AA4BX3R114
5	12	16.9	21.1	AA4B44R114
5.5	12	16.9	21.1	AA4BG4R114
6	12	16.9	21.1	AA4BS4R114
6.5	12	16.9	21.1	AA4B55R114
7	12	16.9	21.1	AA4BH5R114
7.5	12	16.9	21.1	AA4BT5R114
8	12	16.9	21.1	AA4B66R114

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

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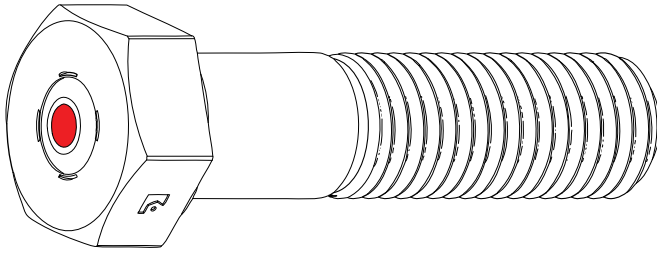
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III. PRODUCTS

DTI SmartBolts®

5/8"-11

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 5/8"
THREAD SIZE: 11
GRADE: 5
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
-----------------	-----------------------	-----------------------------------	--------------------------	-------------

1.75 ††	12	17.1	24.2	AA1CW1E114
2 ††	12	17.1	24.2	AA1C22E114
2.25 ††	12.5	17.9	25.3	AA1C82E114
2.5 ‡	12.5	17.9	25.3	AA1CG2E114
2.75 ‡	13.5	19.1	27	AA1CK2E114
3 ‡	13.5	19.1	27	AA1CQ2E114
3.25 ‡	13.5	19.1	27	AA1CW2E114
3.5	13.5	19.1	27	AA1C33E114
3.75	13.5	19.1	27	AA1C93E114
4	13.5	19.1	27	AA1CF3E114
4.25	13.5	19.1	27	AA1CM3E114
4.5	13.5	19.1	27	AA1CR3E114
4.75	13.5	19.1	27	AA1CX3E114
5	13.5	19.1	27	AA1C44E114
5.5	13.5	19.1	27	AA1CG4E114
6	13.5	19.1	27	AA1CS4E114
6.5	13.5	19.1	27	AA1C55E114
7	13.5	19.1	27	AA1CH5E114
7.5	13.5	19.1	27	AA1CT5E114
8	13.5	19.1	27	AA1C66E114

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

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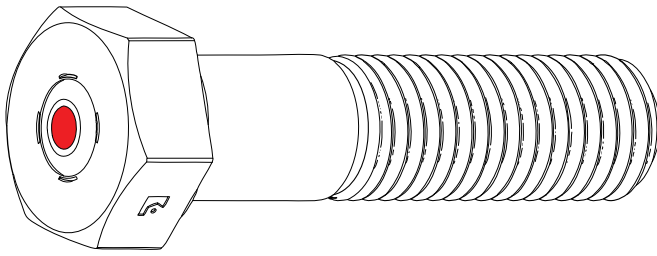
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

5/8"-11

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 5/8"
THREAD SIZE: 11
GRADE: 8
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
-----------------	-----------------------	-----------------------------------	--------------------------	-------------

1.5 ††	17	24.2	30.3	AA1CP1R114
1.75 ††	17	24.2	30.3	AA1CW1R114
2 ††	17	24.2	30.3	AA1C22R114
2.25 ‡	17.5	25.3	31.6	AA1C82R114
2.5 ‡	17.5	25.3	31.6	AA1CG2R114
2.75 ‡	19	27	33.7	AA1CK2R114
3 ‡	19	27	33.7	AA1CQ2R114
3.25	19	27	33.7	AA1CW2R114
3.5	19	27	33.7	AA1C33R114
3.75	19	27	33.7	AA1C93R114
4	19	27	33.7	AA1CF3R114
4.25	19	27	33.7	AA1CM3R114
4.5	19	27	33.7	AA1CR3R114
4.75	19	27	33.7	AA1CX3R114
5	19	27	33.7	AA1C44R114
5.5	19	27	33.7	AA1CG4R114
6	19	27	33.7	AA1CS4R114
6.5	19	27	33.7	AA1C55R114
7	19	27	33.7	AA1CH5R114
7.5	19	27	33.7	AA1CT5R114
8	19	27	33.7	AA1C66R114

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

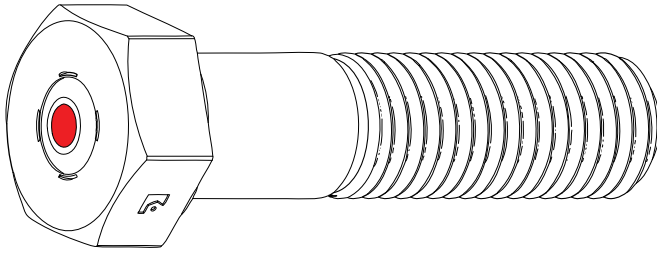
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

3/4"-10

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 3/4"
THREAD SIZE: 10
GRADE: 5
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
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2 ††	18.5	26.4	37.3	AA7C22E114
2.25 ††	18.5	26.4	37.3	AA7C92E114
2.5 ††	18.5	26.4	37.3	AA7CE2E114
2.75 ‡	19	27.2	38.4	AA7CK2E114
3 ‡	20	28.3	40	AA7CQ2E114
3.25	20	28.3	40	AA7CW2E114
3.5	20	28.3	40	AA7C33E114
3.75	20	28.3	40	AA7C93E114
4	20	28.3	40	AA7CF3E114
4.25	20	28.3	40	AA7CM3E114
4.5	20	28.3	40	AA7CR3E114
4.75	20	28.3	40	AA7CX3E114
5	20	28.3	40	AA7C44E114
5.5	20	28.3	40	AA7CG4E114
6	20	28.3	40	AA7CS4E114
6.5	20	28.3	40	AA7C55E114
7	20	28.3	40	AA7CH5E114
7.5	20	28.3	40	AA7CT5E114
8	20	28.3	40	AA7C66E114
8.5	20	28.3	40	AA7CI6E114
9	20	28.3	40	AA7CU6E114
10	20	28.3	40	AA7CJ7E114
11	20	28.3	40	AA7C88E114
12	20	28.3	40	AA7CW8E114

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

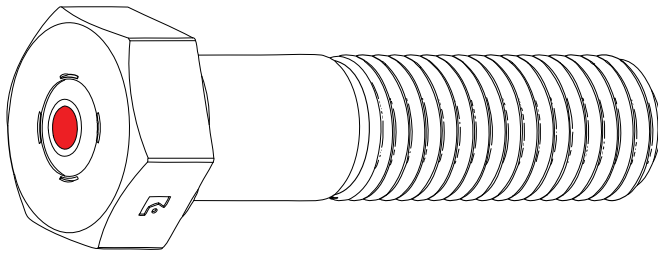
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III. PRODUCTS

DTI SmartBolts®

3/4"-10

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 3/4"
THREAD SIZE: 10
GRADE: 8
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
2 ††	26	37.3	46.6	AA7C22R114
2.25 ††	26	37.3	46.6	AA7C92R114
2.5 ††	26	37.3	46.6	AA7CE2R114
2.75 ‡	27	38.4	48	AA7CK2R114
3 ‡	28	40	50.1	AA7CQ2R114
3.25	28	40	50.1	AA7CW2R114
3.5	28	40	50.1	AA7C33R114
3.75	28	40	50.1	AA7C93R114
4	28	40	50.1	AA7CF3R114
4.25	28	40	50.1	AA7CM3R114
4.5	28	40	50.1	AA7CR3R114
4.75	28	40	50.1	AA7CX3R114
5	28	40	50.1	AA7C44R114
5.5	28	40	50.1	AA7CG4R114
6	28	40	50.1	AA7CS4R114
6.5	28	40	50.1	AA7C55R114
7	28	40	50.1	AA7CH5R114
7.5	28	40	50.1	AA7CT5R114
8	28	40	50.1	AA7C66R114
8.5	28	40	50.1	AA7CI6R114
9	28	40	50.1	AA7CU6R114
10	28	40	50.1	AA7CJ7R114
11	28	40	50.1	AA7C88R114
12	28	40	50.1	AA7CW8R114

NOTE:
† Fully threaded fastener
‡ Minimum grip length requirement
A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

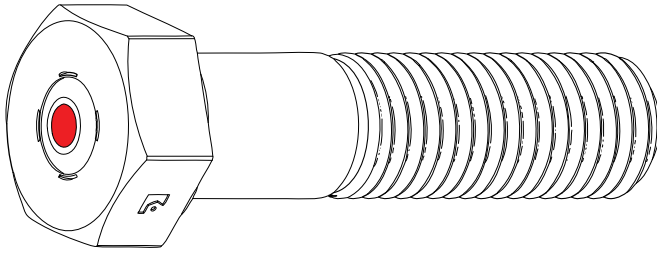
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III. PRODUCTS

DTI SmartBolts®

7/8"-9

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 7/8"
THREAD SIZE: 9
GRADE: 5
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
3 †	26.5	37.9	53.6	AA4DQ2D114 - A
3.25 †	27.5	39.1	55.3	AA4DW2D114 - A
3.5 †	27.5	39.1	55.3	AA4D33D114 - A
3.75 †	27.5	39.1	55.3	AA4D93D114 - A
4	27.5	39.1	55.3	AA4DF3D114 - A
4.25	27.5	39.1	55.3	AA4DM3D114 - A
4.5	27.5	39.1	55.3	AA4DR3D114 - A
4.75	27.5	39.1	55.3	AA4DX3D114 - A
5	27.5	39.1	55.3	AA4D44D114 - A
5.5	27.5	39.1	55.3	AA4DG4D114 - A
6	27.5	39.1	55.3	AA4DS4D114 - A
6.5	27.5	39.1	55.3	AA4D55D114 - A
7	27.5	39.1	55.3	AA4DH5D114 - A
7.5	27.5	39.1	55.3	AA4DT5D114 - A
8	27.5	39.1	55.3	AA4D66D114 - A
8.5	27.5	39.1	55.3	AA4DI6D114 - A
9	27.5	39.1	55.3	AA4DU6D114 - A
10	27.5	39.1	55.3	AA4DJ7D114 - A
11	27.5	39.1	55.3	AA4D88D114 - A
12	27.5	39.1	55.3	AA4DW8D114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

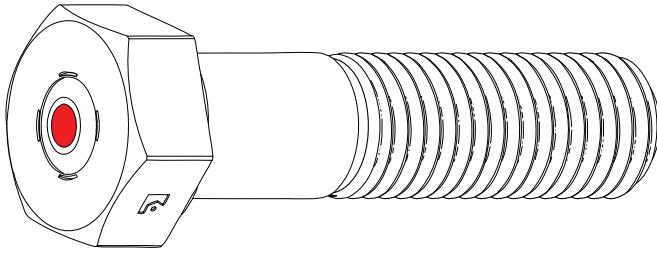
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III. PRODUCTS

DTI SmartBolts®

7/8"-9

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 7/8"
THREAD SIZE: 9
GRADE: 8
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
3 †	37.5	53.6	67	AA4DQ2P114 - A
3.25 †	38.5	55.3	69.1	AA4DW2P114 - A
3.5 †	38.5	55.3	69.1	AA4D33P114 - A
3.75 †	38.5	55.3	69.1	AA4D93P114 - A
4	38.5	55.3	69.1	AA4DF3P114 - A
4.25	38.5	55.3	69.1	AA4DM3P114 - A
4.5	38.5	55.3	69.1	AA4DR3P114 - A
4.75	38.5	55.3	69.1	AA4DX3P114 - A
5	38.5	55.3	69.1	AA4D44P114 - A
5.5	38.5	55.3	69.1	AA4DG4P114 - A
6	38.5	55.3	69.1	AA4DS4P114 - A
6.5	38.5	55.3	69.1	AA4D55P114 - A
7	38.5	55.3	69.1	AA4DH5P114 - A
7.5	38.5	55.3	69.1	AA4DT5P114 - A
8	38.5	55.3	69.1	AA4D66P114 - A
8.5	38.5	55.3	69.1	AA4DI6P114 - A
9	38.5	55.3	69.1	AA4DU6P114 - A
10	38.5	55.3	69.1	AA4DJ7P114 - A
11	38.5	55.3	69.1	AA4D88P114 - A
12	38.5	55.3	69.1	AA4DW8P114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

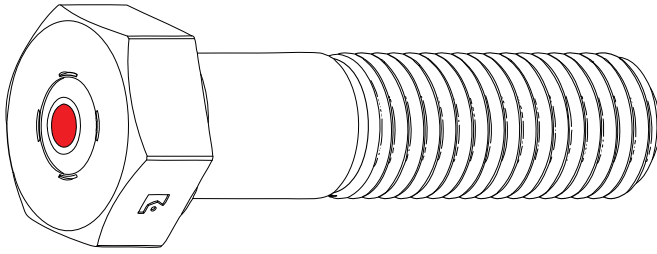
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III. PRODUCTS

DTI SmartBolts®

1"-8

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 1"
THREAD SIZE: 8
GRADE: 5
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
3 †‡	34.5	49.4	69.8	AA1ER2D114 - A
3.25 ‡	35	50.2	70.9	AA1EW2D114 - A
3.5 ‡	35	50.2	70.9	AA1E33D114 - A
3.75 ‡	36	51.4	72.6	AA1E93D114 - A
4 ‡	36	51.4	72.6	AA1EF3D114 - A
4.25	36	51.4	72.6	AA1EM3D114 - A
4.5	36	51.4	72.6	AA1ER3D114 - A
4.75	36	51.4	72.6	AA1EX3D114 - A
5	36	51.4	72.6	AA1E44D114 - A
5.5	36	51.4	72.6	AA1EG4D114 - A
6	36	51.4	72.6	AA1ES4D114 - A
6.5	36	51.4	72.6	AA1E55D114 - A
7	36	51.4	72.6	AA1EH5D114 - A
7.5	36	51.4	72.6	AA1ET5D114 - A
8	36	51.4	72.6	AA1E66D114 - A
8.5	36	51.4	72.6	AA1EI6D114 - A
9	36	51.4	72.6	AA1EU6D114 - A
10	36	51.4	72.6	AA1EJ7D114 - A
11	36	51.4	72.6	AA1E88D114 - A
12	36	51.4	72.6	AA1EW8D114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

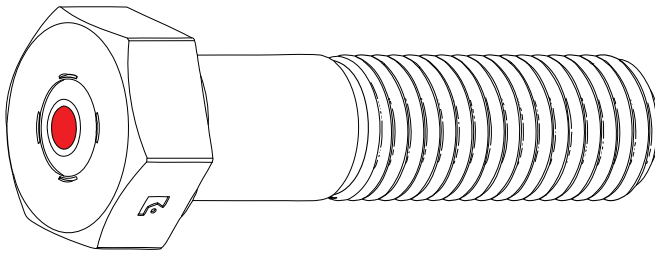
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III. PRODUCTS

DTI SmartBolts®

1"-8

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 1"
THREAD SIZE: 8
GRADE: 8
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
3 †‡	49	69.8	87.3	AA1ER2P114 - A
3.25 ‡	49.5	70.9	88.6	AA1EW2P114 - A
3.5 ‡	49.5	70.9	88.6	AA1E33P114 - A
3.75 ‡	51	72.6	90.7	AA1E93P114 - A
4 ‡	51	72.6	90.7	AA1EF3P114 - A
4.25 ‡	51	72.6	90.7	AA1EM3P114 - A
4.5	51	72.6	90.7	AA1ER3P114 - A
4.75	51	72.6	90.7	AA1EX3P114 - A
5	51	72.6	90.7	AA1E44P114 - A
5.5	51	72.6	90.7	AA1EG4P114 - A
6	51	72.6	90.7	AA1ES4P114 - A
6.5	51	72.6	90.7	AA1E55P114 - A
7	51	72.6	90.7	AA1EH5P114 - A
7.5	51	72.6	90.7	AA1ET5P114 - A
8	51	72.6	90.7	AA1E66P114 - A
8.5	51	72.6	90.7	AA1EI6P114 - A
9	51	72.6	90.7	AA1EU6P114 - A
10	51	72.6	90.7	AA1EJ7P114 - A
11	51	72.6	90.7	AA1E88P114 - A
12	51	72.6	90.7	AA1EW8P114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

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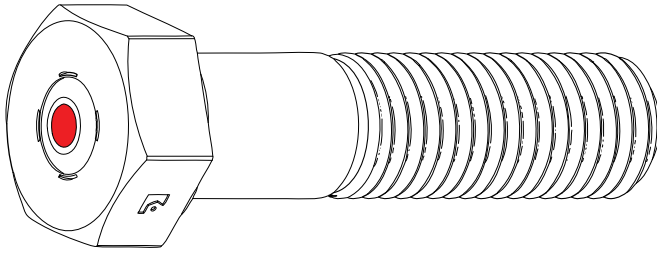
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III. PRODUCTS

DTI SmartBolts®

1-1/8"-7

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 1-1/8"
THREAD SIZE: 7
GRADE: 5
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
4 †	39.5	56.3	80	AA7EF3D114 - A
4.25 †	39.5	56.3	80	AA7EM3D114 - A
4.5 †	39.5	56.3	80	AA7ER3D114 - A
4.75 †	39.5	56.3	80	AA7EX3D114 - A
5	39.5	56.3	80	AA7E44D114 - A
5.5	39.5	56.3	80	AA7EG4D114 - A
6	39.5	56.3	80	AA7ES4D114 - A
6.5	39.5	56.3	80	AA7E55D114 - A
7	39.5	56.3	80	AA7EH5D114 - A
7.5	39.5	56.3	80	AA7ET5D114 - A
8	39.5	56.3	80	AA7E66D114 - A
8.5	39.5	56.3	80	AA7EI6D114 - A
9	39.5	56.3	80	AA7EU6D114 - A
10	39.5	56.3	80	AA7EJ7D114 - A
11	39.5	56.3	80	AA7E88D114 - A
12	39.5	56.3	80	AA7EW8D114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

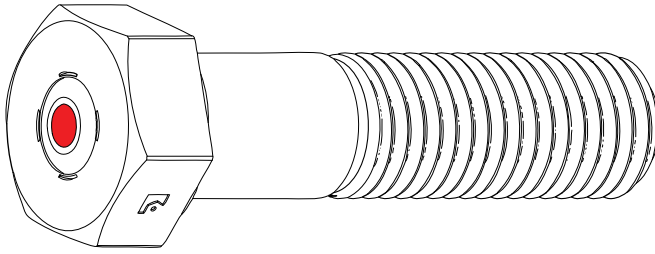
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III. PRODUCTS

DTI SmartBolts®

1-1/8"-7

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 1-1/8"
THREAD SIZE: 7
GRADE: 8
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
4 †	64	91.4	114.3	AA7EF3P114 - A
4.25 †	64	91.4	114.3	AA7EM3P114 - A
4.5 †	64	91.4	114.3	AA7ER3P114 - A
4.75	64	91.4	114.3	AA7EX3P114 - A
5	64	91.4	114.3	AA7E44P114 - A
5.5	64	91.4	114.3	AA7EG4P114 - A
6	64	91.4	114.3	AA7ES4P114 - A
6.5	64	91.4	114.3	AA7E55P114 - A
7	64	91.4	114.3	AA7EH5P114 - A
7.5	64	91.4	114.3	AA7ET5P114 - A
8	64	91.4	114.3	AA7E66P114 - A
8.5	64	91.4	114.3	AA7EI6P114 - A
9	64	91.4	114.3	AA7EU6P114 - A
10	64	91.4	114.3	AA7EJ7P114 - A
11	64	91.4	114.3	AA7E88P114 - A
12	64	91.4	114.3	AA7EW8P114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

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CAN'T FIND YOUR SMARTBOLT?

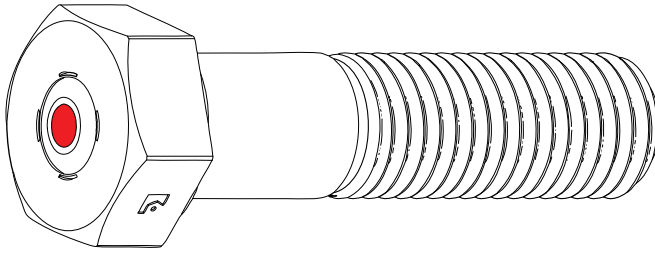
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III. PRODUCTS

DTI SmartBolts®

1-1/4"-7

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 1-1/4"
THREAD SIZE: 7
GRADE: 5
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
4 †	50	71.6	101.6	AA4FF3D114 - A
4.25 †	50	71.6	101.6	AA4FM3D114 - A
4.5 †	50	71.6	101.6	AA4FR3D114 - A
4.75	50	71.6	101.6	AA4FX3D114 - A
5	50	71.6	101.6	AA4F44D114 - A
5.5	50	71.6	101.6	AA4FG4D114 - A
6	50	71.6	101.6	AA4FS4D114 - A
6.5	50	71.6	101.6	AA4F55D114 - A
7	50	71.6	101.6	AA4FH5D114 - A
7.5	50	71.6	101.6	AA4FT5D114 - A
8	50	71.6	101.6	AA4F66D114 - A
8.5	50	71.6	101.6	AA4FI6D114 - A
9	50	71.6	101.6	AA4FU6D114 - A
10	50	71.6	101.6	AA4FJ7D114 - A
11	50	71.6	101.6	AA4F88D114 - A
12	50	71.6	101.6	AA4FW8D114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

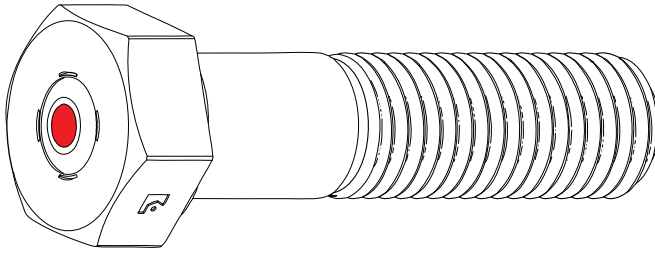
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III. PRODUCTS

DTI SmartBolts®

1-1/4"-7

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 1-1/4"
THREAD SIZE: 7
GRADE: 8
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
4 †	81	116.1	145.2	AA4FF3P114 - A
4.25 †	81	116.1	145.2	AA4FM3P114 - A
4.5 †	81	116.1	145.2	AA4FR3P114 - A
4.75	81	116.1	145.2	AA4FX3P114 - A
5	81	116.1	145.2	AA4F44P114 - A
5.5	81	116.1	145.2	AA4FG4P114 - A
6	81	116.1	145.2	AA4FS4P114 - A
6.5	81	116.1	145.2	AA4F55P114 - A
7	81	116.1	145.2	AA4FH5P114 - A
7.5	81	116.1	145.2	AA4FT5P114 - A
8	81	116.1	145.2	AA4F66P114 - A
8.5	81	116.1	145.2	AA4FI6P114 - A
9	81	116.1	145.2	AA4FU6P114 - A
10	81	116.1	145.2	AA4FJ7P114 - A
11	81	116.1	145.2	AA4F88P114 - A
12	81	116.1	145.2	AA4FW8P114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

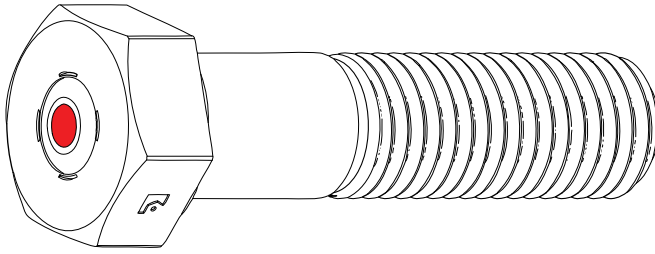
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III. PRODUCTS

DTI SmartBolts®

1-3/8"-6

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 1-3/8"
THREAD SIZE: 6
GRADE: 5
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
6	60	85.3	121.1	AA1GS4D114 - A
6.5	60	85.3	121.1	AA1G55D114 - A
7	60	85.3	121.1	AA1GH5D114 - A
7.5	60	85.3	121.1	AA1GT5D114 - A
8	60	85.3	121.1	AA1G66D114 - A
8.5	60	85.3	121.1	AA1GI6D114 - A
9	60	85.3	121.1	AA1GU6D114 - A
10	60	85.3	121.1	AA1GJ7D114 - A
11	60	85.3	121.1	AA1G88D114 - A
12	60	85.3	121.1	AA1GW8D114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

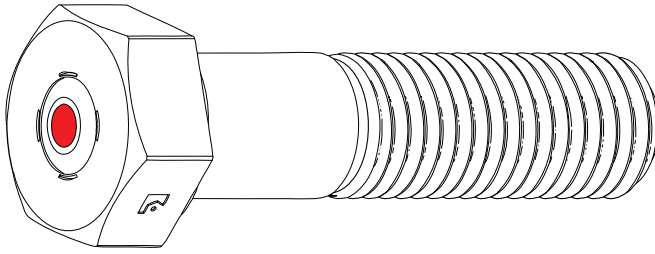
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

1-3/8"-6

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 1-3/8"
THREAD SIZE: 6
GRADE: 8
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
6	97	138.4	173.1	AA1GS4P114 - A
6.5	97	138.4	173.1	AA1G55P114 - A
7	97	138.4	173.1	AA1GH5P114 - A
7.5	97	138.4	173.1	AA1GT5P114 - A
8	97	138.4	173.1	AA1G66P114 - A
8.5	97	138.4	173.1	AA1GI6P114 - A
9	97	138.4	173.1	AA1GU6P114 - A
10	97	138.4	173.1	AA1GJ7P114 - A
11	97	138.4	173.1	AA1G88P114 - A
12	97	138.4	173.1	AA1GW8P114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

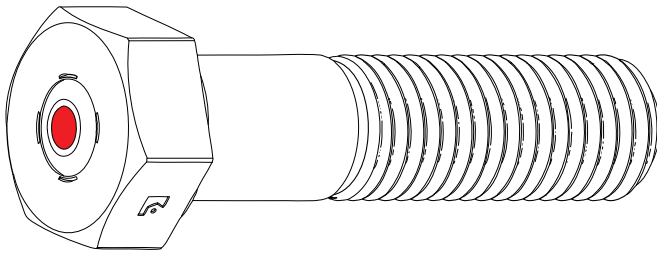
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III. PRODUCTS

DTI SmartBolts®

1-1/2"-6

Grade 5



TYPE: Hex Head Cap Screw
DIAMETER: 1-1/2"
THREAD SIZE: 6
GRADE: 5
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
6.5	73	103.8	147.4	AA7G55D114 - A
7	73	103.8	147.4	AA7GH5D114 - A
7.5	73	103.8	147.4	AA7GT5D114 - A
8	73	103.8	147.4	AA7G66D114 - A
8.5	73	103.8	147.4	AA7GI6D114 - A
9	73	103.8	147.4	AA7GU6D114 - A
10	73	103.8	147.4	AA7GJ7D114 - A
11	73	103.8	147.4	AA7G88D114 - A
12	73	103.8	147.4	AA7GW8D114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

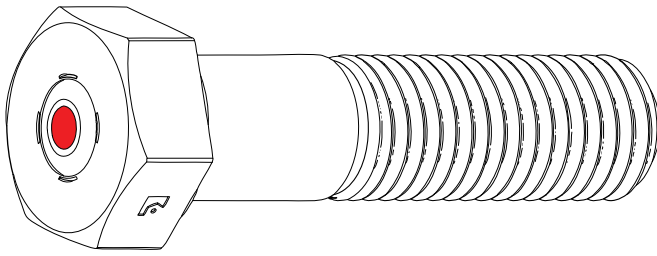
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III. PRODUCTS

DTI SmartBolts®

1-1/2"-6

Grade 8



TYPE: Hex Head Cap Screw
DIAMETER: 1-1/2"
THREAD SIZE: 6
GRADE: 8
FINISH: Plain
DESIGN TENSION: 70%P

Length (inches)	Design Tension (klbf)	Modified Proof Strength, P (klbf)	Ultimate Strength (klbf)	Part Number
6.5	118	168.4	210.6	AA7G55P114 - A
7	118	168.4	210.6	AA7GH5P114 - A
7.5	118	168.4	210.6	AA7GT5P114 - A
8	118	168.4	210.6	AA7G66P114 - A
8.5	118	168.4	210.6	AA7GI6P114 - A
9	118	168.4	210.6	AA7GU6P114 - A
10	118	168.4	210.6	AA7GJ7P114 - A
11	118	168.4	210.6	AA7G88P114 - A
12	118	168.4	210.6	AA7GW8P114 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

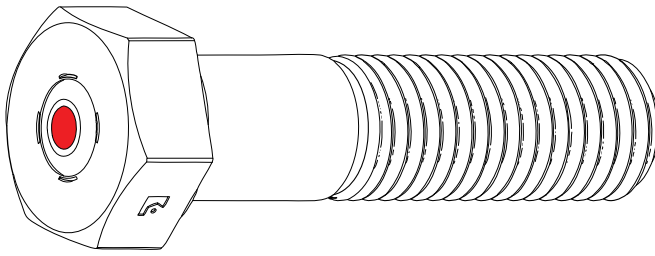
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III. PRODUCTS

DTI SmartBolts®

M10-1.5

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M10
THREAD SIZE: 1.5
CLASS: 8.8
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

30 †‡	17	24	34	MA61E16514
35 ‡	17	24	34	MA61G16514
40 ‡	17	24	34	MA61J16514
45 ‡	20	28	39	MA61M16514
50 ‡	20	28	39	MA61P16514
55	23	33	46	MA61S16514
60	23	33	46	MA61V16514
65	23	33	46	MA61Y16514
70	23	33	46	MA61226514
75	23	33	46	MA61526514
80	23	33	46	MA61826514
90	23	33	46	MA61E26514
100	23	33	46	MA61K26514
110	23	33	46	MA61Q26514
120	23	33	46	MA61W26514
130	23	33	46	MA61336514
140	23	33	46	MA61936514
150	23	33	46	MA61F36514
160	23	33	46	MA61L36514
180	23	33	46	MA61X36514
200	23	33	46	MA61A46514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

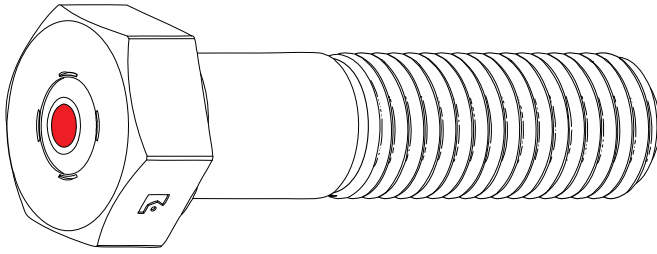
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III. PRODUCTS

DTI SmartBolts®

M10-1.5

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M10
THREAD SIZE: 1.5
CLASS: 10.9
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

30 ††	25	35	44	MA61E1J514
35 ††	25	35	44	MA61H1J514
40 ‡	25	35	44	MA61J1J514
45 ‡	28	40	50	MA61M1J514
50	28	40	50	MA61P1J514
55	28	40	50	MA61S1J514
60	34	48	60	MA61V1J514
65	34	48	60	MA61Y1J514
70	34	48	60	MA6122J514
75	34	48	60	MA6152J514
80	34	48	60	MA6182J514
90	34	48	60	MA61E2J514
100	34	48	60	MA61K2J514
110	34	48	60	MA61Q2J514
120	34	48	60	MA61W2J514
130	34	48	60	MA6133J514
140	34	48	60	MA6193J514
150	34	48	60	MA61F3J514
160	34	48	60	MA61L3J514
180	34	48	60	MA61X3J514
200	34	48	60	MA61A4J514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

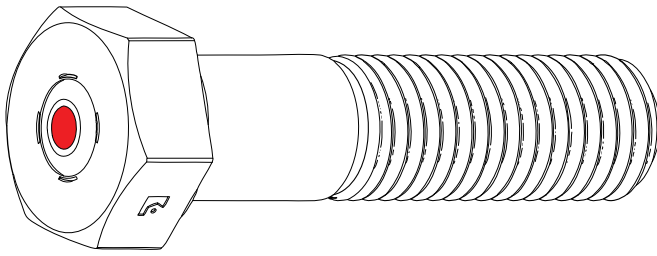
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III. PRODUCTS

DTI SmartBolts®

M12-1.75

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M12
THREAD SIZE: 1.75
CLASS: 8.8
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

30 ††	28	40	55	MA33E16514
35 ††	28	40	55	MA33H16514
40 ††	28	40	55	MA33K16514
45 ††	28	40	55	MA33N16514
50 ‡	30	43	60	MA33P16514
55	34	48	67	MA33S16514
60	34	48	67	MA33V16514
65	34	48	67	MA33Y16514
70	34	48	67	MA33226514
75	34	48	67	MA33526514
80	34	48	67	MA33826514
90	34	48	67	MA33E26514
100	34	48	67	MA33K26514
110	34	48	67	MA33Q26514
120	34	48	67	MA33W26514
130	34	48	67	MA33336514
140	34	48	67	MA33936514
150	34	48	67	MA33F36514
160	34	48	67	MA33L36514
180	34	48	67	MA33X36514
200	34	48	67	MA33A46514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

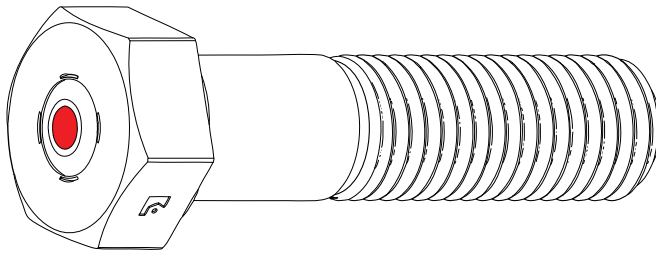
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III. PRODUCTS

DTI SmartBolts®

M12-1.75

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M12
THREAD SIZE: 1.75
CLASS: 10.9
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

30 ††	40	57	72	MA33E1J514
35 ††	40	57	72	MA33H1J514
40 ††	40	57	72	MA33K1J514
45 ‡	43	62	78	MA33M1J514
50 ‡	43	62	78	MA33P1J514
55	48	69	87	MA33S1J514
60	48	69	87	MA33V1J514
65	48	69	87	MA33Y1J514
70	48	69	87	MA3322J514
75	48	69	87	MA3352J514
80	48	69	87	MA3382J514
90	48	69	87	MA33E2J514
100	48	69	87	MA33K2J514
110	48	69	87	MA33Q2J514
120	48	69	87	MA33W2J514
130	48	69	87	MA3333J514
140	48	69	87	MA3393J514
150	48	69	87	MA33F3J514
160	48	69	87	MA33L3J514
180	48	69	87	MA33X3J514
200	48	69	87	MA33A4J514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

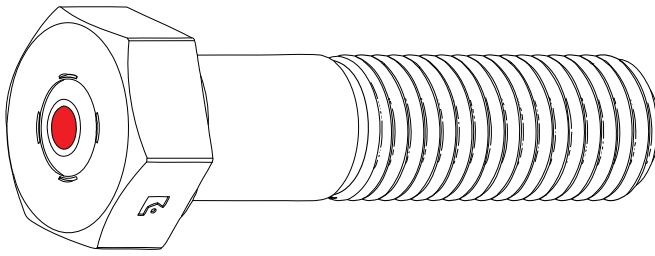
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III. PRODUCTS

DTI SmartBolts®

M16-2.0

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M16
THREAD SIZE: 2.0
CLASS: 8.8
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

40 †‡	58	82	113	MA94K16514
45 †‡	58	82	113	MA94N16514
50 †‡	58	82	113	MA94Q16514
55 †‡	58	82	113	MA94T16514
60 †‡	58	82	113	MA94W16514
65 ‡	60	85	118	MA94Y16514
70	64	90	125	MA94226514
75	64	90	125	MA94526514
80	64	90	125	MA94826514
90	64	90	125	MA94E26514
100	64	90	125	MA94K26514
110	64	90	125	MA94Q26514
120	64	90	125	MA94W26514
130	64	90	125	MA94336514
140	64	90	125	MA94936514
150	64	90	125	MA94F36514
160	64	90	125	MA94L36514
180	64	90	125	MA94X36514
200	64	90	125	MA94A46514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

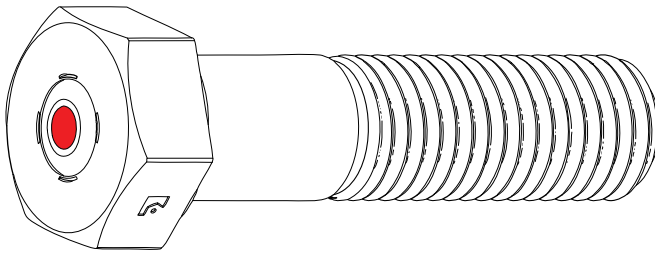
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III. PRODUCTS

DTI SmartBolts®

M16-2.0

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M16
THREAD SIZE: 2.0
CLASS: 10.9
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

40 †‡	82	117	147	MA94K1J514
45 †‡	82	117	147	MA94N1J514
50 †‡	82	117	147	MA94Q1J514
55 ‡	82	117	147	MA94S1J514
60	90	129	162	MA94V1J514
65	90	129	162	MA94Y1J514
70	90	129	162	MA9422J514
75	90	129	162	MA9452J514
80	90	129	162	MA9482J514
90	90	129	162	MA94E2J514
100	90	129	162	MA94K2J514
110	90	129	162	MA94Q2J514
120	90	129	162	MA94W2J514
130	90	129	162	MA9433J514
140	90	129	162	MA9493J514
150	90	129	162	MA94F3J514
160	90	129	162	MA94L3J514
180	90	129	162	MA94X3J514
200	90	129	162	MA94A4J514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

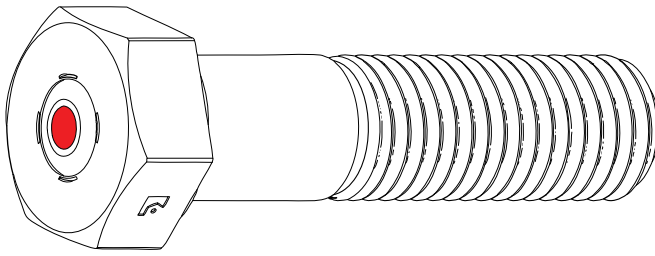
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

M20-2.5

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M20
THREAD SIZE: 2.5
CLASS: 8.8
FINISH: Clear Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

50 †‡	96	137	183	MA66Q16514
55 †‡	96	137	183	MA66T16514
60 †‡	96	137	183	MA66W16514
65 †‡	96	137	183	MA66Z16514
70 †‡	96	137	183	MA66326514
75 †‡	96	137	183	MA66626514
80 †‡	96	137	183	MA66926514
90	102	146	195	MA66E26514
100	102	146	195	MA66K26514
110	102	146	195	MA66Q26514
120	102	146	195	MA66W26514
130	102	146	195	MA66336514
140	102	146	195	MA66936514
150	102	146	195	MA66F36514
160	102	146	195	MA66L36514
180	102	146	195	MA66X36514
200	102	146	195	MA66A46514
220	102	146	195	MA66M46514
240	102	146	195	MA66Y46514
260	102	146	195	MA66B56514
280	102	146	195	MA66N56514
300	102	146	195	MA66Z56514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

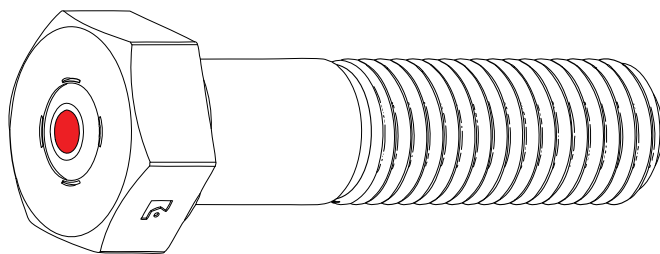
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III. PRODUCTS

DTI SmartBolts®

M20-2.5

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M20
THREAD SIZE: 2.5
CLASS: 10.9
FINISH: Yellow Zinc
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
-------------------------	------------------------	------------------------------------	---------------------------	-------------

50 †‡	134	190	239	MA66Q1J514
55 †‡	134	190	239	MA66T1J514
60 ‡	134	190	239	MA66V1J514
65 ‡	134	190	239	MA66Y1J514
70 ‡	134	190	239	MA6622J514
75	142	203	254	MA6652J514
80 †‡	134	190	239	MA6682J514
90	142	203	254	MA66E2J514
100	142	203	254	MA66K2J514
110	142	203	254	MA66Q2J514
120	142	203	254	MA66W2J514
130	142	203	254	MA6633J514
140	142	203	254	MA6693J514
150	142	203	254	MA66F3J514
160	142	203	254	MA66L3J514
170	142	203	254	MA66R3J514
180	142	203	254	MA66X3J514
200	142	203	254	MA66A4J514
220	142	203	254	MA66M4J514
240	142	203	254	MA66Y4J514
260	142	203	254	MA66B5J514
280	142	203	254	MA66N5J514
300	142	203	254	MA66Z5J514

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

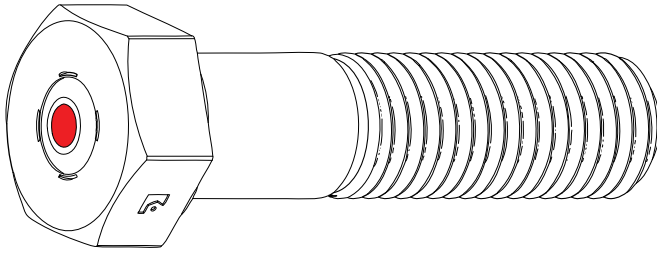
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III. PRODUCTS

DTI SmartBolts®

M22-2.5

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M22
THREAD SIZE: 2.5
CLASS: 8.8
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
80	128	182	242	MA37825514 - A
90	128	182	242	MA37E25514 - A
100	128	182	242	MA37K25514 - A
110	128	182	242	MA37Q25514 - A
120	128	182	242	MA37W25514 - A
130	128	182	242	MA37335514 - A
140	128	182	242	MA37935514 - A
150	128	182	242	MA37F35514 - A
160	128	182	242	MA37L35514 - A
180	128	182	242	MA37X35514 - A
200	128	182	242	MA37A45514 - A
220	128	182	242	MA37M45514 - A
240	128	182	242	MA37Y45514 - A
260	128	182	242	MA37B55514 - A
280	128	182	242	MA37N55514 - A
300	128	182	242	MA37Z55514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

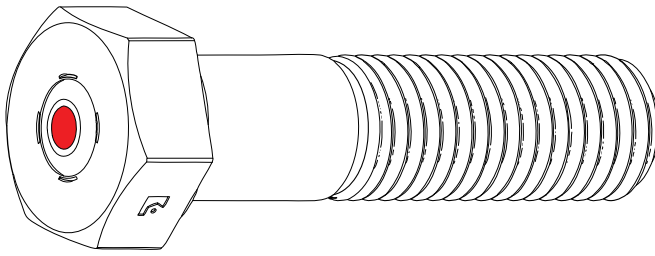
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III. PRODUCTS

DTI SmartBolts®

M22-2.5

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M22
THREAD SIZE: 2.5
CLASS: 10.9
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
80	176	251	315	MA3782H514 - A
90	176	251	315	MA37E2H514 - A
100	176	251	315	MA37K2H514 - A
110	176	251	315	MA37Q2H514 - A
120	176	251	315	MA37W2H514 - A
130	176	251	315	MA3733H514 - A
140	176	251	315	MA3793H514 - A
150	176	251	315	MA37F3H514 - A
160	176	251	315	MA37L3H514 - A
180	176	251	315	MA37X3H514 - A
200	176	251	315	MA37A4H514 - A
220	176	251	315	MA37M4H514 - A
240	176	251	315	MA37Y4H514 - A
260	176	251	315	MA37B5H514 - A
280	176	251	315	MA37N5H514 - A
300	176	251	315	MA37Z5H514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

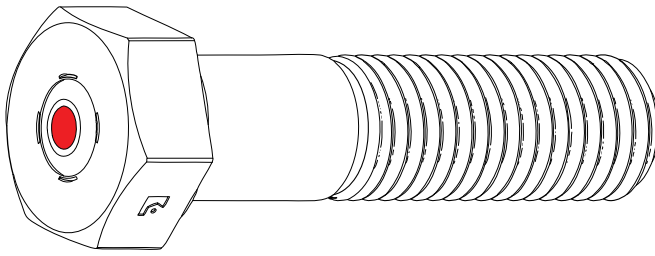
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III. PRODUCTS

DTI SmartBolts®

M24-3.0

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M24
THREAD SIZE: 3.0
CLASS: 8.8
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
80 †‡	142	202	280	MA18925514 - A
90 †‡	142	202	280	MA18F25514 - A
100	148	211	292	MA18K25514 - A
110	148	211	292	MA18Q25514 - A
120	148	211	292	MA18W25514 - A
130	148	211	292	MA18335514 - A
140	148	211	292	MA18935514 - A
150	148	211	292	MA18F35514 - A
160	148	211	292	MA18L35514 - A
180	148	211	292	MA18X35514 - A
200	148	211	292	MA18A45514 - A
220	148	211	292	MA18M45514 - A
240	148	211	292	MA18Y45514 - A
260	148	211	292	MA18B55514 - A
280	148	211	292	MA18N55514 - A
300	148	211	292	MA18Z55514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

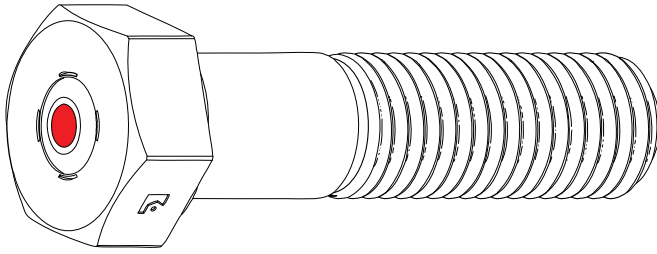
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

M24-3.0

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M24
THREAD SIZE: 3.0
CLASS: 10.9
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
80 †‡	196	280	351	MA1892H514 - A
90	204	292	366	MA18E2H514 - A
100	204	292	366	MA18K2H514 - A
110	204	292	366	MA18Q2H514 - A
120	204	292	366	MA18W2H514 - A
130	204	292	366	MA1833H514 - A
140	204	292	366	MA1893H514 - A
150	204	292	366	MA18F3H514 - A
160	204	292	366	MA18L3H514 - A
180	204	292	366	MA18X3H514 - A
200	204	292	366	MA18A4H514 - A
220	204	292	366	MA18M4H514 - A
240	204	292	366	MA18Y4H514 - A
260	204	292	366	MA18B5H514 - A
280	204	292	366	MA18N5H514 - A
300	204	292	366	MA18Z5H514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

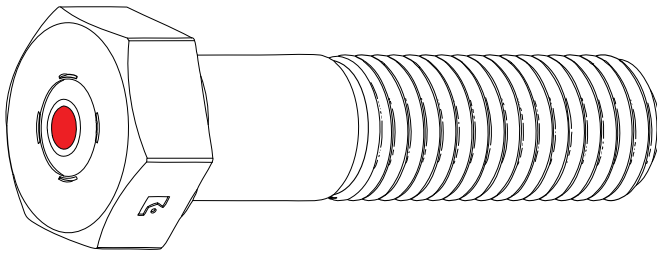
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

M27-3.0

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M27
THREAD SIZE: 3.0
CLASS: 8.8
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
100	192	275	381	MA19K25514 - A
110	192	275	381	MA19Q25514 - A
120	192	275	381	MA19W25514 - A
130	192	275	381	MA19335514 - A
140	192	275	381	MA19935514 - A
150	192	275	381	MA19F35514 - A
160	192	275	381	MA19L35514 - A
180	192	275	381	MA19X35514 - A
200	192	275	381	MA19A45514 - A
220	192	275	381	MA19M45514 - A
240	192	275	381	MA19Y45514 - A
260	192	275	381	MA19B55514 - A
280	192	275	381	MA19N55514 - A
300	192	275	381	MA19Z55514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

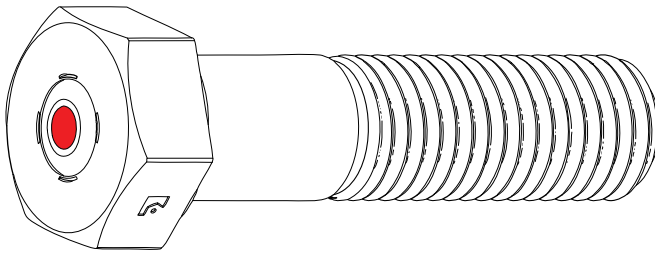
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

M27-3.0

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M27
THREAD SIZE: 3.0
CLASS: 10.9
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
100	265	381	477	MA19K2H514 - A
110	265	381	477	MA19Q2H514 - A
120	265	381	477	MA19W2H514 - A
130	265	381	477	MA1933H514 - A
140	265	381	477	MA1993H514 - A
150	265	381	477	MA19F3H514 - A
160	265	381	477	MA19L3H514 - A
180	265	381	477	MA19X3H514 - A
200	265	381	477	MA19A4H514 - A
220	265	381	477	MA19M4H514 - A
240	265	381	477	MA19Y4H514 - A
260	265	381	477	MA19B5H514 - A
280	265	381	477	MA19N5H514 - A
300	265	381	477	MA19Z5H514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

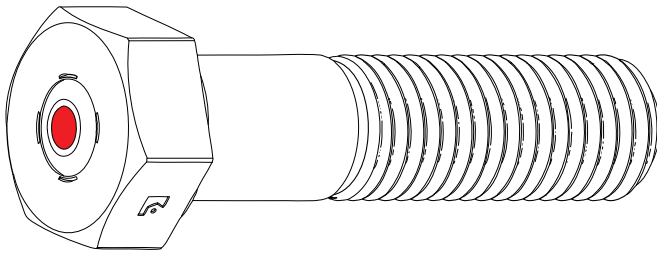
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III. PRODUCTS

DTI SmartBolts®

M30-3.5

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M30
THREAD SIZE: 3.5
CLASS: 8.8
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
100 ‡	230	327	452	MA2AK25514 - A
110	235	336	465	MA2AQ25514 - A
120	235	336	465	MA2AW25514 - A
130	235	336	465	MA2A335514 - A
140	235	336	465	MA2A935514 - A
150	235	336	465	MA2AF35514 - A
160	235	336	465	MA2AL35514 - A
180	235	336	465	MA2AX35514 - A
200	235	336	465	MA2AA45514 - A
220	235	336	465	MA2AM45514 - A
240	235	336	465	MA2AY45514 - A
260	235	336	465	MA2AB55514 - A
280	235	336	465	MA2AN55514 - A
300	235	336	465	MA2AZ55514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

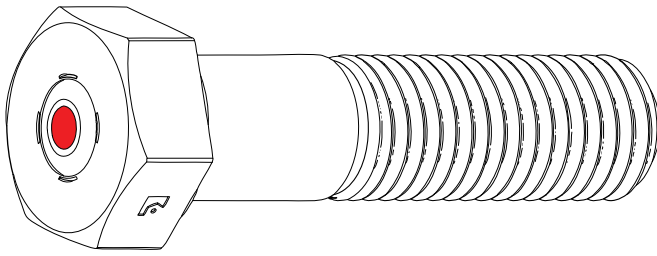
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

M30-3.5

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M30
THREAD SIZE: 3.5
CLASS: 10.9
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
100 †	315	452	567	MA2AK2H514 - A
110	325	465	583	MA2AQ2H514 - A
120	325	465	583	MA2AW2H514 - A
130	325	465	583	MA2A33H514 - A
140	325	465	583	MA2A93H514 - A
150	325	465	583	MA2AF3H514 - A
160	325	465	583	MA2AL3H514 - A
180	325	465	583	MA2AX3H514 - A
200	325	465	583	MA2AA4H514 - A
220	325	465	583	MA2AM4H514 - A
240	325	465	583	MA2AY4H514 - A
260	325	465	583	MA2AB5H514 - A
280	325	465	583	MA2AN5H514 - A
300	325	465	583	MA2AZ5H514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

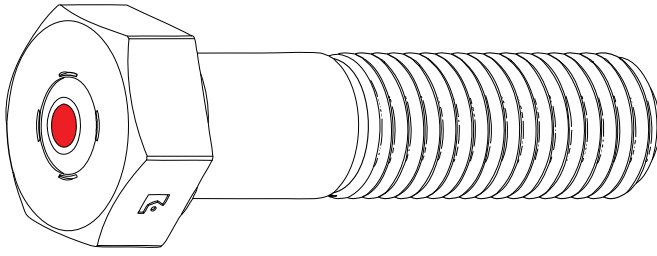
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III. PRODUCTS

DTI SmartBolts®

M33-3.5

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M33
THREAD SIZE: 3.5
CLASS: 8.8
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
150	290	416	575	MA1BF35514 - A
160	290	416	575	MA1BL35514 - A
180	290	416	575	MA1BX35514 - A
200	290	416	575	MA1BA45514 - A
220	290	416	575	MA1BM45514 - A
240	290	416	575	MA1BY45514 - A
260	290	416	575	MA1BB55514 - A
280	290	416	575	MA1BN55514 - A
300	290	416	575	MA1BZ55514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

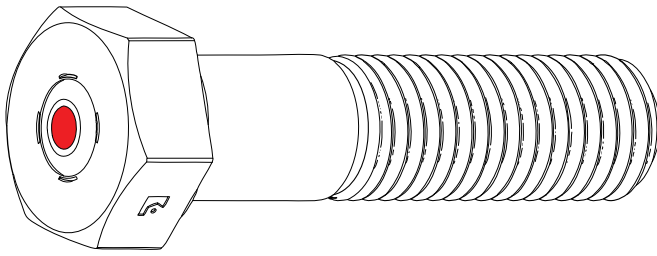
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III. PRODUCTS

DTI SmartBolts®

M33-3.5

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M33
THREAD SIZE: 3.5
CLASS: 10.9
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
150	405	575	721	MA1BF3H514 - A
160	405	575	721	MA1BL3H514 - A
180	405	575	721	MA1BX3H514 - A
200	405	575	721	MA1BA4H514 - A
220	405	575	721	MA1BM4H514 - A
240	405	575	721	MA1BY4H514 - A
260	405	575	721	MA1BB5H514 - A
280	405	575	721	MA1BN5H514 - A
300	405	575	721	MA1BZ5H514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

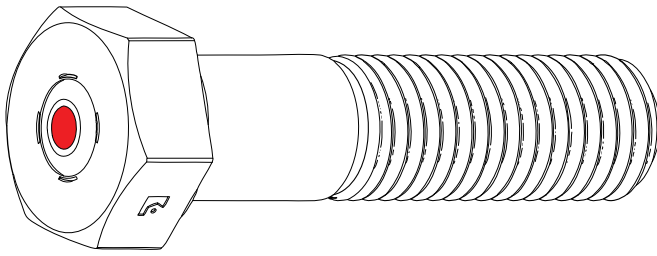
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III. PRODUCTS

DTI SmartBolts®

M36-4.0

Class 8.8



TYPE: Hex Head Cap Screw
DIAMETER: M36
THREAD SIZE: 4.0
CLASS: 8.8
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
180	345	490	677	MA7BX35514 - A
200	345	490	677	MA7BA45514 - A
220	345	490	677	MA7BM45514 - A
240	345	490	677	MA7BY45514 - A
260	345	490	677	MA7BB55514 - A
280	345	490	677	MA7BN55514 - A
300	345	490	677	MA7BZ55514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

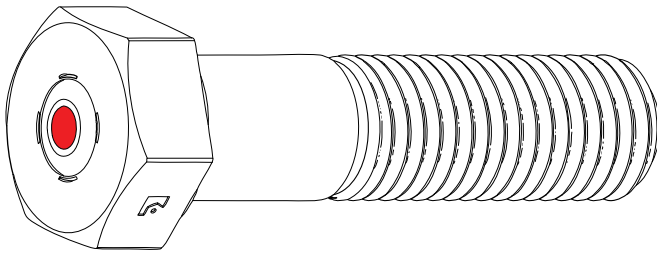
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III. PRODUCTS

DTI SmartBolts®

M36-4.0

Class 10.9



TYPE: Hex Head Cap Screw
DIAMETER: M36
THREAD SIZE: 4.0
CLASS: 10.9
FINISH: Plain
DESIGN TENSION: 70%P

Length (millimeters)	Design Tension (kN)	Modified Proof Strength, P (kN)	Ultimate Strength (kN)	Part Number
180	475	677	849	MA7BX3H514 - A
200	475	677	849	MA7BA4H514 - A
220	475	677	849	MA7BM4H514 - A
240	475	677	849	MA7BY4H514 - A
260	475	677	849	MA7BB5H514 - A
280	475	677	849	MA7BN5H514 - A
300	475	677	849	MA7BZ5H514 - A

NOTE:

- † Fully threaded fastener
- ‡ Minimum grip length requirement
- A Protective recess

All above listed DTI SmartBolts® products have an indicating design tension of 70% of fastener modified proof strength.

CAN'T FIND YOUR SMARTBOLT?

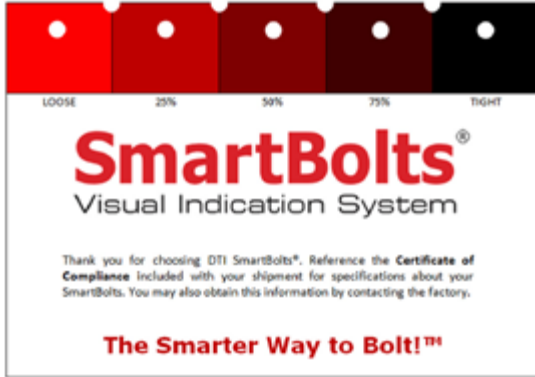
If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

III. PRODUCTS

DTI SmartBolts®

Verification Guide

PART NUMBER: VG11



The Verification Guide presents the continuous spectrum of the DTI SmartBolts® indicator range as five distinct regions of indicator color.

Laminated for rugged use, the guide fits into a pocket and can be quickly deployed to check bolt tension. It is the perfect training and validation tool for both new and experienced users.

Demonstration Unit

PART NUMBER: DU11



The Demonstration Unit is a lightweight, hand-held device designed to show how DTI SmartBolts® work without special fixtures or wrenches. Watch the indicator change across the full spectrum from red to black with a simple twist of the handle.

These units are perfect for meetings or training to instantly convey the DTI SmartBolts® operation to co-workers whether you are in the conference room, the factory floor or in the field.

CAN'T FIND YOUR SMARTBOLT?

If the SmartBolt you need is not listed in this catalog, use our [Product Request Form](#) to submit your requirements.

IV. BOLTING TERMS

Bolting terms for SmartBolts® properties, as used in this catalog.

CLAMP FORCE:

The compressive force on the joint members that results from the tensile force developed in a tightened bolt. This force, not torque, is what holds your bolted joint together.

TENSION:

The tensile force developed by tightening a bolt. It is equal and opposite to the clamp force – the force holding your bolted joint together. Tension is the force that SmartBolts® measure and display.

DESIGN TENSION:

The tensile force on the bolt, measured in klbf or kN, at which SmartBolts® are designed to indicate the “Tight” color. “Tight” shows the bolt has been properly installed and Preload is established. All of the SmartBolts® products listed in this catalog have an indicating Design Tension of 70% of fastener Modified Proof Strength.

PROOF STRENGTH:

The tensile strength of a bolt beyond which permanent elongation of the bolt may occur. SmartBolts® are designed to operate in tensile loads from zero up to proof strength. This is called the elastic region of the bolt.

MODIFIED PROOF STRENGTH:

The proof strength of the bolt after conversion into a SmartBolt. In all but the shortest bolt lengths listed in this catalog, this strength is identical to the bolt proof strength before modification.

ULTIMATE STRENGTH:

The maximum tensile load that a bolt can withstand before breaking.

GRIP LENGTH:

The combined thickness of all components joined together between the bolt head and nut. Given in inches for Inch series SmartBolts® and millimeters for Metric series SmartBolts®.

MINIMUM GRIP LENGTH:

With respect to SmartBolts® in this catalog, if a Minimum Grip Length is denoted, there is a limit to how far the nut can be run up the shank during installation before it begins to impact the accuracy of the SmartBolts® indicator. Customers may contact the factory to learn what the specified minimum grip length is for a particular SmartBolts® model, if it applies.

KLBF (KILOPOUNDS-FORCE):

A measure of tensile force or clamp force on a bolt as it is tightened. Design Tension, Proof Strength, and Ultimate Strength are expressed in klbf for Inch series SmartBolts®.

KN (KILONEWTONS):

A measure of tensile force or clamp force on a bolt as it is tightened. Design Tension, Proof Strength, and Ultimate Strength are expressed in kN for Metric series SmartBolts®.

NUT FACTOR:

A constant that attempts to model all of the many variables (such as friction) that affect the torque-tension relationship. Torque charts depend on an assumption of the nut factor, but it is very difficult to predict and measure. SmartBolts® eliminate the nut factor from the bolting equation, measuring and displaying Tension directly.

PRELOAD:

The tensile force developed during installation (tightening) of a bolt. This load can be directly measured and displayed by the SmartBolts® indicator.

STRESS:

Force per unit area. For bolts, it is often expressed in PSI (pounds per square inch). The metric equivalent measure is mPa (megapascals).

STRESS AREA:

The effective cross sectional area of the threaded region in a bolt.

STRAIN:

With respect to bolts under tensile force, Strain is the measure of elongation of the bolt as it is stretched.

TORQUE:

A twisting or rotational force given in units of pound-feet (lb-ft) or Newton-meters (Nm). It is a measure of how much force is required to turn the head or nut of a bolt. Torque is related to bolt tension by the nut factor, which is difficult to predict. SmartBolts® allow proper bolted joint installation without concern for torque or nut factor, eliminating the requirement to use a torque wrench.

V. CERTIFICATION

Quality Certification

SmartBolts® are 100% inspected and tested to ensure that each one that we produce complies with our demanding quality control standards. Each product is tested under tension until the color of the indicator reaches a prescribed value. A Certificate of Compliance will be included with each shipped order to certify that DTI SmartBolts® have undergone and passed all essential test, inspection and packaging requirements.

Two Year Limited Warranty

SmartBolt products are warranted to the original end user for two years from the date of purchase. Within the period of this warranty, we will replace any defective product, on return of the part, prepaid to the factory. This warranty does not extend to damage resulting from abuse, misuse, over-tightening, exceeding specified temperature limits, accident (including shipping damage), or use in hostile environments including, but not limited to, acidic, petroleum, solvents or solvent vapors. In no event shall any liability of Stress Indicators, Inc. arising from this warranty exceed the purchase price of the SmartBolt products. Before using, the user shall determine the suitability of the product for their intended use, and the user assumes all risk and liability whatsoever of the product in connection therewith. Stress Indicators, Inc. makes no warranty of merchantability or fitness for a particular purpose. In no event shall Stress Indicators, Inc. be liable for incidental or consequential damages.

Fastener Quality Act Conformance

Products may not be identical to the original record of conformance to the Fastener Quality Act due to their alteration and conversion to direct tension-indicating SmartBolts®. The raw bolts have been drilled and machined and tension-indicating components have been installed. In most cases, the conversion process will have negligible effect on bolt strength. The customer will be informed of any significant strength reduction due to the alteration.

Disclaimer

While we try to make sure that all data posted in this catalog is accurate at all times, we are not responsible for typographical and other errors that may appear. Data is subject to change without notice. Stress Indicators assumes no responsibility or liability for any damages incurred directly or indirectly as a result of any data errors, omissions, or discrepancies.



STRESS INDICATORS *INCORPORATED*

Engineered Bolting Solutions

