



**R/SP/8004/02**  
**Date 14/11/2017**

## PRODUCT SPECIFICATIONS

## OPERATING AND MAINTENANCE INSTRUCTIONS

**Technical Specifications**

**Operating Conditions and Limits**

**Operator's Instructions**

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**How and how often periodical fitness inspections should be conducted**

**TURNBUCKLE STUDS**  
**ITEM 8004**

## 1) TECHNICAL SPECIFICATIONS OF ACCESSORY

**Material / Reference Standard:** Steel S235JR - UNI EN 10025-2

**Heat Treatment:** /

**Surface Treatment:**

- Self-coloured: naturally coloured, just as forged and mechanically worked
- Galvanized A2E EN ISO 4042

The test is performed on the basis of in-house specifications and rules in accordance with UNI EN ISO 9001.

## DIMENSIONAL SPECIFICATIONS:

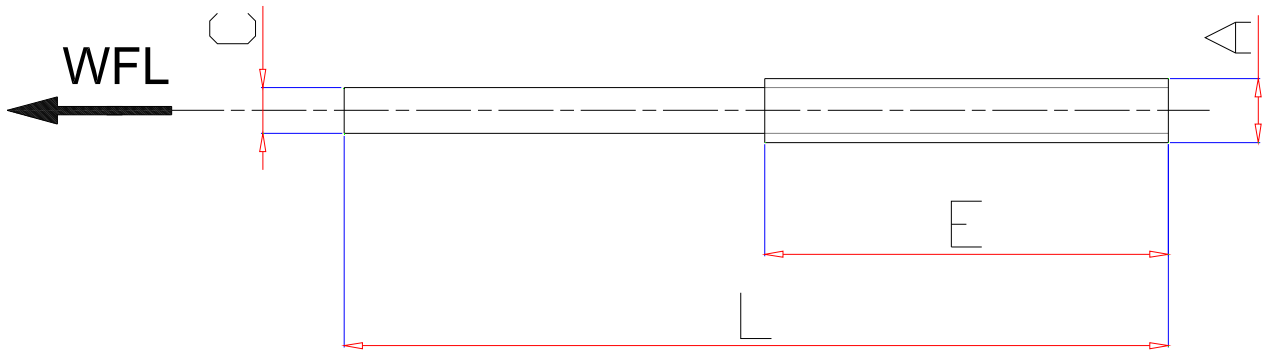



TABLE "A"

All measurements are expressed in mm.

A (Rolled thread)	A''	C	E	L	 g	WFL kg	ITEM NUMBER			
							SELF-COLOURED		GALVANIZED	
							RIGHT THREAD	LEFT THREAD	RIGHT THREAD	LEFT THREAD
M5 x 0.8	3/16	4.3	40	80	10	115	080040005A0	080040105A0	080040505A0	080040605A0
M6 x 1	1/4	5.1	44	90	15	160	080040006A0	080040106A0	080040506A0	080040606A0
M8 x 1.25	5/16	7.0	53	105	32	300	080040008A0	080040108A0	080040508A0	080040608A0
M10 x 1.5	3/8	8.8	63	125	60	470	080040010A0	080040110A0	080040510A0	080040610A0
M11 x 1.5	7/16	9.9	68	135	90	580	080040011A0	080040111A0	080040511A0	080040611A0
M12 x 1.75	1/2	10.6	70	140	100	690	080040012A0	080040112A0	080040512A0	080040612A0
M14 x 2	9/16	12.5	85	170	165	940	080040014A0	080040114A0	080040514A0	080040614A0
M16 x 2	5/8	14.5	95	190	250	1290	080040016A0	080040116A0	080040516A0	080040616A0
M18 x 2.5	11/16	16.1	103	205	320	1660	080040018A0	080040118A0	080040518A0	080040618A0
M20 x 2.5	3/4	18.0	110	220	440	2130	080040020A0	080040120A0	080040520A0	080040620A0
M22 x 2.5	7/8	20.0	120	240	700	2630	080040022A0	080040122A0	080040522A0	080040622A0
M24 x 3	1"	21.8	130	260	760	3060	080040024A0	080040124A0	080040524A0	080040624A0
M27 x 3	1"1/8	24.8	135	280	1090	4000	080040027A1	080040127A1	080040527A0	080040627A0
M30 x 3.5	1"3/16	27.5	140	280	1550	4860	080040030A1	080040130A1	080040530A0	080040630A0
M33 x 3.5	1"1/4	30.0	150	300	1600	6040	080040033A0	080040133A0	080040533A0	080040633A0
M36 x 4	1"3/8	32.0	150	300	1900	6500	080040098A1	080040198A1	080040598A0	080040698A0
M39 x 4	1"1/2	35.0	150	300	2300	7900	080040099A1	080040199A1	080040599A0	080040699A0

WFL = WORKING FORCE LIMIT

SAFETY COEFFICIENT: 4

## Definitions:

- **WFL** (working force limit): the maximum force the item can support (along the main axis, if not otherwise specified) under operating conditions.
- **Safety coefficient:** guaranteed minimum breaking force to working force limit ratio.
- **Inspection:** visual testing of the state of the turnbuckle stud, to check for clear damage or wear which may affect its use.
- **Accurate examination:** visual inspection performed by a trained person, supported, if need be, by any other instruments, including non-destructive testing, to check for damage or wear which may affect the use of the item.
- **Trained person:** a designated, suitably trained person who has proper know-how and practical expertise and has been given the instructions needed to perform any required tests and examinations.

**CAUTION:** The safety coefficient is only provided by way of example, in relation to product safety. The working force limits (WFL) shown in the table should never be exceeded.

## 2) TESTING SPECIFICATIONS

The accessory is subjected to several stringent spot checks for serviceability, performance and compliance with specifications.

The number of samples and the related sampling plans are chosen according to the characteristic to test under UNI ISO 2859/1, and the results are filed in the quality department of the factory in Sulmona.

### 2.A Dimensional test

Making sure that the dimensions of the item meet such tolerances as established in in-house working drawings.

### 2.B Visual test

Testing for defects resulting from mechanical working and surface coating.

### 2.C Chemical analysis

Making sure that the chemical composition of the material complies with the limits established under the relevant standards.

### 2.D Tensile stress tests

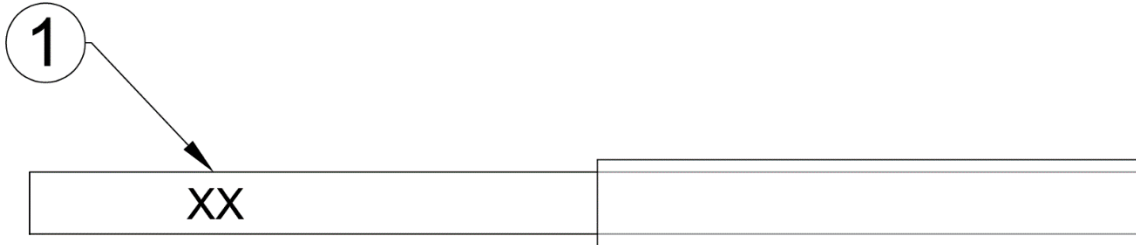
Making sure that the accessory subjected to tensile stress will break, after the applied force has at least exceeded the working load as multiplied by the safety coefficient.

The test is performed in accordance with UNI 10002/1.

### 3) HOW TO READ MARKINGS

The accessory carries the following indelible marks and codes:

#### 1) Traceability code (only for sizes from M10 to M39)



### 4) GENERAL WARNINGS

The manual must be kept by the person in charge in a suitable place and readily available for consultation, in optimal conditions.

the constructor retains all material and intellectual rights on the manual, and restricts its modification, albeit partial, for any commercial use.

As regards the information provided in these operating instructions, BETA UTENSILI SPA will accept no responsibility in the event of:

- any use of the accessories other than the uses under national safety and accident prevention laws;
- mistaken choice or arrangement of the apparatus they are going to be connected to;
- failure to comply with, or properly follow, the operating instructions;
- changes to the accessories;
- misuse or failure to carry out routine maintenance jobs;
- use with noncompliant accessories.

### 5) SELECTION CRITERIA

The following parameters should be carefully considered in choosing the turnbuckle studs:

#### 5.A WORKING FORCE LIMIT

The tensile stress exerted on the turnbuckle stud **should be lower than or equal to** the working force limit (WFL) recommended for the item being considered, and shown in Table "A".

#### 5.B CONNECTING PART

Make sure that the connecting part suits the load capacity of the turnbuckle stud.

### 5.C LIFE AND FREQUENCY OF USE

The accessory is perfectly serviceable as long as its geometric and physical characteristics remain unchanged.

Hence the turnbuckle should be replaced in case of reduced section, deformation, corrosion or connecting instability.

### 6) NONPERMISSIBLE CONDITIONS

The turnbuckle studs should not be operated under the following circumstances:

- when the applied force exceeds the permissible “WFL”;
- when dynamic stresses or swinging loads may result;
- when the turnbuckles are operated under any temperatures other than the permissible temperatures;
- when the directrix of forces does not develop along the main axis.

### 7) PRELIMINARY TESTS

Before the accessories are operated and/or assembled, they should be tested by a suitably trained person.

- Check the state of the turnbuckle studs; in particular make sure that it is free from cuts, bends, indentations, abrasions, cracks, irregular threads, corrosions, sharp burrs, wear or defects resulting from improper storage.
- Measure and record the dimensions according to **Table “A”**.
- Make sure that the threads fit.

### 8) INSTALLATION – ASSEMBLY INSTRUCTIONS

During the installation of the accessory please use adequate Personal Protective Equipment: gloves, safety shoes, helmet, etc.

Screw the turnbuckle studs onto the turnbuckle body, so that maximum opening can be achieved, and connect them to the parts to pull.

Insert one part for each terminal.

Any weld on the ends of the studs should suit the capacity of the turnbuckle.

Exert tensile stress through the main body, making sure that, after the operating condition has been reached, the turnbuckle studs have been inserted into the body at least throughout the length of its thread.

While exerting tensile stress, make sure that the turnbuckle can freely move and position itself; hence no forcing or interference should occur, to prevent any lateral force components from being produced.

Tensile stress should be checked after a short period, to make up for any system adjustments.

Particular attention is required while tensioning, to prevent the working force limit (WFL, see Table “A”) from being exceeded, which would result in permanent deformation, especially if any levers or mechanical means are used.

## 9) USING ACCESSORY – GRIP AND HANDLING

The turnbuckle stud is designed to be used in static situations; periodically check tensile stress, the state of preservation of the parts and their connection, according to the Table “Maintenance jobs and inspections”.

## 10) NONPERMISSIBLE USE

Using the accessory for any purposes other than the purposes it has been designed for, using it under extremely dangerous conditions and performing poor maintenance may pose **a severe hazard to the safety of the people being exposed** and cause severe damage to the working environment, while affecting the actual serviceability and safety of the product. The precautions mentioned below, which, obviously enough, cannot cover the whole spectrum of potential “**misuses**” of the accessory, should be “reasonably” deemed to be the most common steps to take. Therefore:

- DO NOT connect the accessory to any apparatus which does not match its specifications in terms of size, temperature, hook-up point and shape;
- DO NOT use the accessory for lifting purposes;
- DO NOT stretch any apparatus that may change its static configuration, centre of gravity or chemical and physical state;
- DO NOT use the accessory to lift or carry people or animals;
- DO NOT use the accessory to pull restrained loads;
- DO NOT work in areas where any explosion/spark-proof parts are expected to be used or in the presence of big magnetic fields.

## 11) FITNESS FOR USE

The accessory was subjected to spot check in order to test serviceability and performance at the manufacturer’s. The certificate supplied with it states that the tests were passed. However, before starting working, the user should test the installed accessory for serviceability and performance, to prove the entire system is fit for use.

## 12) INSPECTION AND MAINTENANCE

Inspections and maintenance jobs should be carried out by trained personnel, who should perform accurate tests during operation.

Below is a list of tests to perform at such intervals as stated in the table “**Maintenance jobs and inspections**”.

- **VISUAL TEST:** making sure that the accessory is free from surface defects, including cracks, indentations, cuts, fissures and abrasions.
- **THREAD TEST:** making sure that the thread is free from wear, deformation and dents, that its fit is accurate and stable, and that there is not too much clearance.
- **DEFORMATION TEST:** making sure that the accessory has not got deformed, using a gauge to measure such critical dimensions as shown in **Table “A”**. **NO DEFORMATIONS** will be tolerated compared to the measurements made when the accessory was **first put into operation**.
- **WEAR TEST:** making sure that the points of contact are not worn, using a gauge to measure such critical dimensions as shown in **Table “A”**.
- **PRESERVATION TEST:** making sure that the accessory is free from oxidation and corrosion, especially in case of outdoor use; using suitable methods (e.g. liquid penetrants) to make sure that it is free from cracks.

The results of the above-mentioned tests should be stored.

<b>Maintenance jobs and inspections</b>			
<b>Type of inspection</b>	Whenever used	Month	Year
General visual inspection	<b>X</b>		
Thread state	<b>X</b>		
Deformation	<b>X</b>		
Wear		<b>X</b>	
State of preservation			<b>X</b>

If the item has been used for heavy-duty jobs, both wear and the state of preservation should be tested for more frequently.

## 13) SCRAPPING ACCESSORY

The accessory should be scrapped by cutting, so that it can no longer be used, whether at the end of its expected lifetime or if:

- it is permanently worn compared to the original size;
- any cracks or distortions are shown, and/or the sections have become small compared to the original size;
- the state of the thread is such that the parts do not fit perfectly, any threads are worn, deformed, irregular etc.