The EIGHT ADVANTAGES of UNBRAKO ® SOCKET CAP SCREWS

Unbrako has developed and maintained certain manufacturing advantages that continue to set us apart from all competition. The **Unbrako** unique features and benefits are as follows:

1. ALL SOCKET CAP SCREWS HAVE FORGED HEADS AND HEX SOCKETS

The ASTM A574 (Inch) Specifications and the ASTM A574M (Metric) Specifications mandate cold or hot-formed heads through 1 1/2" or M20 respectively. In all sizes the specification permits hex sockets to be forged or machined. **All Unbrako socket cap screw heads and their hex sockets are forged.** When heads and hex sockets are forged, the flow lines of the material are continuous, resulting in increased strength, better installation ability, and a longer product life.

2. ALL SOCKET CAP SCREWS HAVE ROLLED THREADS

The ASTM A574 (Inch) Specifications and the ASTM A574M (Metric) Specifications require rolled threads through 5/8" diameter and for screw lengths through 4", or respectively with metrics requiring rolled threads through M24 diameter, and product lengths up to150 mm inclusive. Larger products may be rolled, cut, or ground at the option of the manufacturer. Ground threads are not produced because of excessive costs. Cut threads interrupt the grain flow of the material and result in weaker threads. Conversely, roll threading compresses the material's grain flow and enhances fatigue resistance. Because of this benefit, **All Unbrako socket cap screws are roll threaded.**

3. HIGHER MINIMUM TENSILE STRENGTHS

The ASTM A574 (Inch) Specifications and the ASTM A574M (Metric) Specifications specify minimum tensile strength of 180,000 psi through 1/2", and 170,000 psi for 5/8" sizes larger, and the appropriate metric equivalents in Mega Pascals. The corresponding requirements for core hardness are HRC 39 to 45 for 1/2" or smaller, and HRC 37 to 45 for 5/8" sizes and larger. **Unbrako tensile specifications are 10,000 psi higher than standards - while maintaining the core hardness range.**
We do this to offer the greatest strength that can be derived from the alloy materials while staying within the core hardness, and thus meeting the ASTM Specifications. This achievement is no small matter. It means extremely tight controls on our heat treatment process.

4. E-CODE ™ LOT CODE ™ HEAD MARKINGS

This is a patented alphanumeric head marking system that allows each fastener to be traced to its original manufacturing lot, raw material chemistry, and performance test results. That is, **the codes on the top of the heads are traceable to the testing records of each production lot.** This feature is on all inch and metric socket cap screws, ¼" or 6 mm and larger. It is the ultimate in product tracking.

5. COMPOUND FILLET RADIUS

Each size of socket screw has a specially designed compound fillet radius that blends two different radii within the ASME B18.3 standard fillet "envelope." This design change alone is responsible for doubling tension-tension fatigue life, the most common loading in application.

The EIGHT ADVANTAGES of UNBRAKO ® SOCKET CAP SCREWS

6. RADIUSED ROOT THREAD RUNOUT

At the beginning of 1966, the thread specification for aircraft fasteners, MIL-S-8879, was released. In Revision A of this spec, it stated that the runout threads must have root radii as large or larger than the normal root radius of the threads. The purpose of this requirement was to strengthen this specific area of the fastener, because this was where most fastener failures occurred.

The initial use of this specification was for aircraft fasteners, and while it certainly proved its worthiness in these applications, it has never been added to any commercial fastener standard. However, **Unbrako Group saw the merits of this technological advancement, embraced this concept, and developed a Radiused Root Runout as a standard feature on all of our socket cap screws.**

7. "WR" THREAD FORM

This is an Unbrako proprietary thread form that fits within the standard UNR thread profile. "WR" stands for WIDE ROOT. This unique thread form has two major differences, and they are both achieved with special thread roll dies made by our Hi-Life Tool division. First, the root of the thread is made as wide as the Unified Screw Thread Series permits. Secondly, we restrict the tolerance of the root radius to the upper, largest 30% of the specification. With this combination, **"WR" provides the strongest UNR thread form, and with the greatest opportunity to maximize fatigue resistance.** This is an Unbrako exclusive. We're the only fastener manufacturer using this design. It's a benefit of having our own thread roll die manufacturing plants.

8. ETCHING FOR THREAD LAPS

When threads are rolled onto our products, random samples are being etched in heated acid, and then examined under a stereo microscope to detect thread laps. A thread lap is a flaw. It's a folding of material when the threads are being rolled. If you don't check for laps in this method, they're not likely to be detected. The result will be built-in product defects that then become prime areas to begin fatigue cracking, and then subsequent fastener failures. **Because of these efforts, we can certify to ASTM F788, Supplemental Requirement, S1. for Assemblies Subject to Severe Dynamic Stresses on all Unbrako socket cap screws.**

These EIGHT ADVANTAGES set Unbrako apart from any other socket cap screw manufacturer.

Additionally, we run in-process Statistical Process Control on selected, dynamic dimensional characteristics of our products. However, as a check-and-balance, we also perform a Final Inspection on random samples taken from each lot. We also perform a full compliment of laboratory tests, as required by ASTM specifications - including decarburization, hardness, and wedge tensile strength. We are very proud to be registered to the International Quality System, ISO 9001 since 1996.

Unbrako (Europe)
Deepak Fasteners (Shannon) Ltd.
BAYS 25-30, Shannon Industrial Estate
County Clare, IRELAND
Ph: +353-61-716-500
Fax: +353-61-716-584
Email: unbrako.europe@unbrako.com

Unbrako (UK)
Deepak Fasteners (U.K) Ltd.
12-14 TOWER STREET, Newtown,
BIRMINGHAM (U.K), B19 3RR
Ph: +44-121-333-4610
Fax: +44-121-333-4525
Email: unbrako.uk@unbrako.com

Unbrako (Australia)
Deepak Fasteners (Australia) Pty Ltd.
70 Norcal Road, Nunawading,
Victoria 3131 Australia
Ph: +61-3-98750729
Fax: +61-3-98940038
Email: info@unbrako.com

Unbrako (India)
Deepak Fasteners Ltd.
4th Floor, First Mall, The Mall
Ludhiana-141001(PB.)
INDIA
Ph: +91-161-3911111
Fax: +91-161-2774400
Email: unbrako@unbrako.in

Unbrako (USA)
INTERFAST U.S.A.
4444 Lee Road
Cleveland, Ohio 44128-2902
Ph: +216-581-3000
Fax: +800-225-5777
Email: unbrakosales@unbrako.ca