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REMINC / CONTI

POWERLOK®II™ SCREWS

END-USER SPECIFICATIONS

PR-188
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Leaders in Lowering the Cost of Assembly

INTRODUCTION and SCOPE

This document provides end-users of POWERLOK®II™ fasteners dimensional and material information to be used as a uniform standard for POWERLOK®II™ fasteners. End-users may use this copyrighted material to create their own in-house POWERLOK®II™ fastener standards. This information is intended for use only with genuine POWERLOK®II™ products and prior notification to and permission from REMINC/CONTI is required before incorporating this copyrighted material into any company documents.

DESIGN

POWERLOK®II™ fasteners are prevailing torque fasteners that provide resistance to loosening from vibrational forces, thermal cycling or other alternating loads in threaded nut members or nuts. POWERLOK®II™ fasteners often eliminate the need for lock washers, adhesives or patches, lowering the in-place cost of assembly.

POWERLOK®II™ fasteners have a special dual-angle thread form to provide interference in standard 6H (metric) or 2B (inch) internal threads. POWERLOK®II™ fasteners are available in two general configurations; The tapered lead threads may be (1) sharp or (2) underfilled crests to provide ease of hand starting into a nut member. The prevailing torque performance of the fastener is unaffected and the choice for sharp or underfilled threads should be left to the fastener manufacturer, as the part configuration will determine the manufacturing sequence and point configuration.

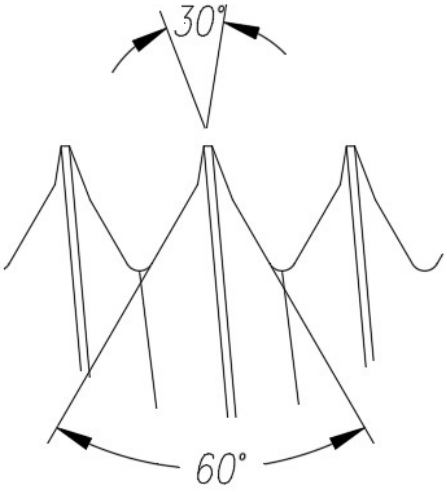
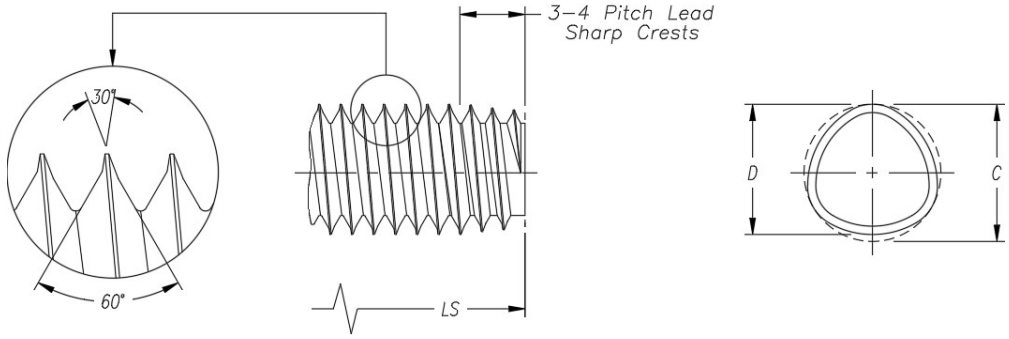


Figure 1: POWERLOK®II™ Thread Profile

The heat treatment for POWERLOK®II™ fasteners, referred to as CORFLEX® N™, is a slightly modified neutral hardened heat treatment. POWERLOK®II™ fasteners can be supplied with standard coatings and lubricants.

DIMENSIONS



METRIC SIZES	C		D	
	Max.	Min.	Max.	Min.
M2.0 x 0.40	2.15	2.05	2.11	2.01
M2.5 x 0.45	2.66	2.56	2.62	2.52
M3.0 x 0.50	3.18	3.08	3.13	3.03
M3.5 x 0.60	3.69	3.59	3.63	3.53
M4.0 x 0.70	4.22	4.10	4.15	4.03
M5.0 x 0.80	5.26	5.13	5.18	5.05
M6.0 x 1.00	6.30	6.15	6.20	6.05
M8.0 x 1.25	8.35	8.20	8.23	8.08
M10.0 x 1.50	10.40	10.25	10.25	10.10
M12.0 x 1.75	12.45	12.30	12.28	12.13
INCH SIZES	C		D	
	Max.	Min.	Max.	Min.
4-40	0.1170	0.1120	0.1145	0.1095
5-40	0.1310	0.1250	0.1285	0.1225
6-32	0.1470	0.1410	0.1439	0.1379
8-32	0.1725	0.1665	0.1694	0.1634
10-24	0.2050	0.1980	0.2008	0.1938
10-32	0.1995	0.1925	0.1964	0.1894
12-24	0.2310	0.2240	0.2268	0.2198
1/4-20	0.2695	0.2615	0.2645	0.2565
1/4-28	0.2625	0.2545	0.2589	0.2509
5/16-18	0.3315	0.3235	0.3259	0.3179
3/8-16	0.3945	0.3865	0.3883	0.3803
7/16-14	0.4595	0.4515	0.4524	0.4444
1/2-13	0.5235	0.5155	0.5158	0.5078

POWERLOK®II™ Dimensions

MATERIAL

Carbon steel shall conform to ISO-898-1

Cold heading quality fully killed carbon steel, fine grain, spherodized annealed.

HEAT TREATMENT

Standard POWERLOK®II™ screws are neutral hardened following CORFLEX®-N™ heat treatment process.

Hardening and Quenching: Fasteners are heated above the steel transformation temperature and quenched directly from the furnace heat into water, oil, or a suitable synthetic with good agitation to achieve uniform quench hardness.

Tempering: Screws shall be tempered suitably to acquire physical and mechanical properties to match ISO 898-1.

HEAD MARKING

To identify CORFLEX®-N™ screws as equivalent property class but not the same as a neutral hardened machine screw, markings must be different than machine screws as stated here.

ISO 898-1 Property Class	8.8	9.8	10.9
CORFLEX®- N™	8N	9N	10N

Follow guidance from ISO 898-1 for head markings.

PHYSICAL AND MECHANICAL PROPERTIES with TEST METHODS

Core Hardness: The standard core hardness is in accordance with ISO 898-1 PC 10.9, (HRC 33-39 / HV 330-390) but 8.8, 9.8 or 12.9 could be used in certain applications.

Surface Hardness: The surface hardness shall not be more than 30 Vickers points above the measured core hardness on the product when readings of both surface and core are carried out.

Surface Hardness Test: The surface hardness shall be measured using the Vickers Hardness Testing Procedure in accordance with ISO 6507. The surface hardness shall be performed on the head after removal of any finish and suitable preparation (1200 grit grinding or better). Care should be taken to remove as little material as possible. For referee purposes, a micro-hardness instrument with a Vickers indenter and a 300g load shall be used. In such cases, measurements shall be made on the thread profile of a suitably prepared longitudinal metallographic specimen.

Decarburization: During the hardening process the carbon potential of the atmosphere shall be maintained at a level between "zero" (0) decarburization to slightly more than the carbon content of the screws being processed. This process of carbon restoration is designed to eliminate partial and total decarburization of the screw thread form. Partial or complete decarburization of the screw thread form would seriously impair the locking function of the screw.

Carbon enrichment up to 0.1mm maximum from the surface of the screw is permitted because of the carbon restoration process.

Decarburization Test: Longitudinal sections shall be taken through the thread axis approximately one nominal diameter from the end of the screw. The specimen shall be suitably mounted and prepared for metallographic examination at not less than 100 x magnification. Prior to examination the sample shall be etched in Nital solution.

Ductility: Head of screw shall not separate from the shank in a Wedge Tensile Test.

Wedge Tensile Test: Screws shall meet wedge tensile breaking loads as specified in ISO-898/1 for the applicable equivalent property class (8.8, 9.8, 10.9). Screws not having suitable head styles (i.e. countersunk heads) are exempt from this test. Screws with lengths shorter than 13mm have a length less than or three times the nominal screw diameter are also exempt.

FASTENER FINISH / COATINGS

POWERLOK®II™ fasteners can accept standard coatings.

Hydrogen embrittlement risk mitigation through BAKING must be considered post-processing for electroplated fasteners and fasteners assembled with washers**. Washers** exhibit material conditions that when combined with environmental and loading factors can cause HE failures.