

ILNAS

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ILNAS-EN 14399-10:2018

High-strength structural bolting assemblies for preloading - Part 10: System HRC - Bolt and nut assemblies with calibrated preload

Hochfeste vorspannbare Garnituren für Schraubverbindungen im
Metallbau - Teil 10: System HRC - Garnituren aus Schrauben und
Muttern mit kalibrierter Vorspannung

Boulonnerie de construction métallique à haute résistance apte à
la précontrainte - Partie 10 : Système HRC - Boulons (vis + écrou +
rondelle) à précontrainte calibrée

05/2018



National Foreword

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English Version

High-strength structural bolting assemblies for preloading - Part 10: System HRC - Bolt and nut assemblies with calibrated preload

Boulonnerie de construction métallique à haute
résistance apte à la précontrainte - Partie 10 : Système
HRC - Boulons (vis + écrou + rondelle) à précontrainte
calibrée

Hochfeste vorspannbare Garnituren für
Schraubverbindungen im Metallbau - Teil 10: System
HRC - Garnituren aus Schrauben und Muttern mit
kalibrierter Vorspannung

This European Standard was approved by CEN on 22 October 2017.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 14399-10:2018) has been prepared by Technical Committee CEN/TC 185 “Fasteners”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2018 and conflicting national standards shall be withdrawn at the latest by November 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14399-10:2009.

In comparison with EN 14399-10:2009, the following modifications have been made:

- Table 1 containing the overview of the marking of components of bolting assemblies for preloading was added;
- specifications for the designation of the bolting assemblies have been revised;
- dimensions and markings of HRC bolts with countersunk heads have been added;
- dimensions and limiting values of M36 diameter bolts and nuts have been added;
- the requirement for the coefficient of variation has been revised.

EN 14399 consists of the following parts, under the general title *High-strength structural bolting assemblies for preloading*:

- *Part 1: General requirements*
- *Part 2: Suitability for preloading*
- *Part 3: System HR — Hexagon bolt and nut assemblies*
- *Part 4: System HV — Hexagon bolt and nut assemblies*
- *Part 5: Plain washers*
- *Part 6: Plain chamfered washers*
- *Part 7: System HR — Countersunk head bolt and nut assemblies*
- *Part 8: System HV — Hexagon fit bolt and nut assemblies*
- *Part 9: System HR or HV — Direct tension indicators for bolt and nut assemblies*
- *Part 10: System HRC — Bolt and nut assemblies with calibrated preload*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document on structural bolting reflects the situation in Europe where two technical solutions exist to achieve the necessary ductility of bolt/nut/washer(s) assemblies. These solutions consist of two different types (HR and HV) of bolt/nut/washer assemblies, see Table 1. Both types are well proven and it is the responsibility of the experts using structural bolting whether they use the one or the other type.

It is, however, important for the performance of the assembly to avoid mixing up the components of both types. Therefore, bolts and nuts for both types are standardized in one single part of this European Standard each and the marking of the components of the bolting assemblies is uniform.

Preloaded bolted assemblies are very sensitive to differences in manufacture and lubrication. Therefore it is important that the bolting assemblies are supplied by one manufacturer, who is always responsible for the functionality of the bolting assemblies as supplied.

For the same reason it is important that coating of the bolting assemblies is under the control of one manufacturer.

Beside the mechanical properties of the components, the functionality of the bolting assemblies requires that the specified preload can be achieved if the bolting assemblies are tightened with a suitable procedure. For this purpose a test method for the suitability of the bolting assemblies for preloading was created, which will demonstrate whether the functionality of the bolting assemblies is fulfilled.

It should be pointed out that compared to ISO 272 the width across flats (large series) for M12 and M20 have been changed to 22 mm and 32 mm respectively. These changes are justified by the following reasons.

Under the specific conditions of structural bolting, the compressive stresses under the bolt head or nut for the sizes M12 may become too large with the width across flats of 21 mm, especially if the washer is fitted eccentrically to the bolt axis.

For the size M20, the width across flats of 34 mm is very difficult to be produced. The change to 32 mm is primarily motivated by economics but it should also be pointed out that the width across flats of 32 mm was common practice in Europe.

Table 1 — Composition of high-strength structural bolting assemblies and component marking

Type of bolting assembly		System HR				System HV		System HRC	
General requirements		EN 14399-1							
Suitability for preloading		EN 14399-2 and, if any, additional testing specified in the product standard							
Bolt and nut		EN 14399-3		EN 14399-7		EN 14399-4	EN 14399-8	EN 14399-10	
Marking	Bolt	HR8.8	HR10.9	HR8.8	HR10.9	HV10.9	HVP10.9	HRC10.9	
	Nut	HR8 or HR10	HR10	HR8 or HR10	HR10	HV10	HV10	HR10	HRD10
Washer(s)		EN 14399-5 ^a or EN 14399-6				EN 14399-6		EN 14399-5 ^a or EN 14399-6	
Marking		H or HR ^b				H or HV ^b		H or HR ^b	H or HR ^b or HD ^c
Direct tension indicator and nut face washer or bolt face washer, if any		EN 14399-9							
Marking	Direct tension indicator	H8	H10	H8	H10	H10			
	Nut face washer	HN				HN			
	Bolt face washer	HB		Not applicable		HB			
^a EN 14399-5 can only be used under the nut.									
^b At the choice of the manufacturer.									
^c Mandatory mark for washers with enlarged outer diameter according to EN 14399-5 only.									