

ISO 17607-6:2023-12 (E)

Steel structures - Execution of structural steelwork - Part 6: Bolting

Contents

	Page
Foreword.....	vi
Introduction.....	vii
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 Execution specification and quality requirements.....	2
4.1 General.....	2
4.2 Execution specification.....	2
5 Constituent products.....	3
5.1 General.....	3
5.1.1 Selection of constituent products.....	3
5.1.2 Verification of conformance.....	3
5.2 Structural bolting products.....	4
5.2.1 Property classes.....	4
5.2.2 Structural bolting assemblies for non-pretensioned applications.....	4
5.2.3 Structural bolting assemblies for pretensioned applications.....	4
5.2.4 Washers.....	4
5.2.5 Direct tension indicators.....	5
5.2.6 Alternative direct tension indicators.....	5
5.2.7 Coated structural bolting components.....	6
5.2.8 Atmospheric corrosion-resistant structural bolting components.....	6
5.2.9 Locking devices.....	6
5.2.10 Special structural fasteners.....	6
5.2.11 Packaging.....	7
5.2.12 Test reports.....	7
5.2.13 Delivery and identification.....	7
5.2.14 Storage of structural bolting components and assemblies.....	7
5.2.15 Reconditioning of structural bolting components and assemblies.....	7
5.3 Studs and shear connectors.....	8
5.4 Anchorages.....	8
5.4.1 Foundation bolts.....	8
5.4.2 Other anchorage systems.....	8
6 Preparation and assembly.....	8
6.1 General.....	8
6.2 Holes for structural bolting.....	8
6.2.1 General.....	8
6.2.2 Dimensions of holes.....	9
6.3 Faying surfaces for bearing-type joints.....	10
6.4 Preparation of friction surfaces in slip-resistant joints.....	10
6.4.1 General.....	10
6.4.2 Surface preparation.....	10
6.4.3 Precautions prior to assembly.....	10
6.5 Assembly.....	11
7 Structural bolting.....	12
7.1 General.....	12
7.2 Joint types and assembly.....	12
7.2.1 Joint type.....	12
7.2.2 Fit of joint and shims.....	12

7.2.3	Packing plates.....	12
7.2.4	Snugging of joint.....	13
7.2.5	Sequence of tightening.....	13
7.2.6	Structural bolts.....	14
7.2.7	Nuts.....	14
7.2.8	Washers.....	15
7.2.9	Locking methods.....	17
7.3	Tightening of non-pretensioned bolts.....	18
7.4	Tightening of pretensioned bolts.....	18
7.4.1	Bolting procedure for pretensioned bolts.....	18
7.4.2	Pretensioning tools.....	18
7.4.3	Minimum pretension.....	19
7.4.4	Bolting assembly k-class calibration.....	19
7.4.5	k-factor.....	19
7.4.6	Pre-installation verification testing.....	20
7.4.7	Torque method.....	20
7.4.8	Combined method.....	20
7.4.9	Spline-drive twist-off method.....	20
7.4.10	Direct tension indicator method.....	20
7.4.11	Turn-of-nut method.....	20
7.5	Fit bolts.....	20
7.6	Temporary bolts.....	21
7.7	Loss of pretension.....	21
7.8	Reuse of structural bolts.....	22
7.9	Use of special fasteners.....	22
7.10	Galling and seizure of stainless-steel structural bolts.....	23
8	Inspection, testing, and correction.....	23
8.1	General.....	23
8.2	Structural bolting inspection.....	23
8.2.1	Inspection prior to erection of steelwork.....	23
8.2.2	Inspection prior to installation of bolts.....	24
8.2.3	Inspection after installation of bolts.....	24
8.2.4	Inspection of pretensioned bolts.....	24
8.2.5	Inspection of special structural fasteners and special methods.....	27
8.3	Correction.....	28
8.3.1	Excessive coating thickness.....	28
8.3.2	Replacement of structural bolting components and assemblies.....	28
9	Documents required to claim conformity to this document.....	28
9.1	General.....	28
9.2	Declaration of conformity.....	28
Annex A	(normative) Additional information, list of options and requirements related to the execution levels.....	29
Annex B	(normative) Bolting component, assembly and coating standards.....	34
Annex C	(normative) Nominal hole clearances for bolts.....	38
Annex D	(normative) Bolted friction surface slip factors.....	41
Annex E	(normative) Nominal minimum pretension.....	43
Annex F	(normative) Threads in grip, thread protrusion, and use of taper washers.....	45
Annex G	(normative) Pre-installation verification testing for pretensioned bolting assemblies.....	47
Annex H	(normative) Calibration test for the EN 14399 series pretensioned bolts under site conditions.....	48
Annex I	(normative) Pretensioning bolting assemblies — Torque method.....	53
Annex J	(normative) Pretensioning bolting assemblies — Combined method.....	55
Annex K	(normative) Pretensioning bolting assemblies — Spline-drive twist-off method.....	59
Annex L	(normative) Pretensioning bolting assemblies — Direct tension indicator method.....	60

Annex M (normative) **Pretensioning bolting assemblies — Turn-of-nut method**..... 61
Annex N (informative) **Bolt tightening qualification procedure (BTQP)**..... 63
Annex O (normative) **Method for structural bolting inspection** 73
Annex P (normative) **Test to determine slip factor** 78
Annex Q (informative) **Test to determine loss of pretension**..... 85
Bibliography..... 87