EN 14399 - Preloaded structural bolting assemblies

Technical reference sheet | Rev. 29.09.2026

High-strength assemblies intended for preloading: HR, HV and HRC systems, with components and installation matched to the project.

Identifying components and markings



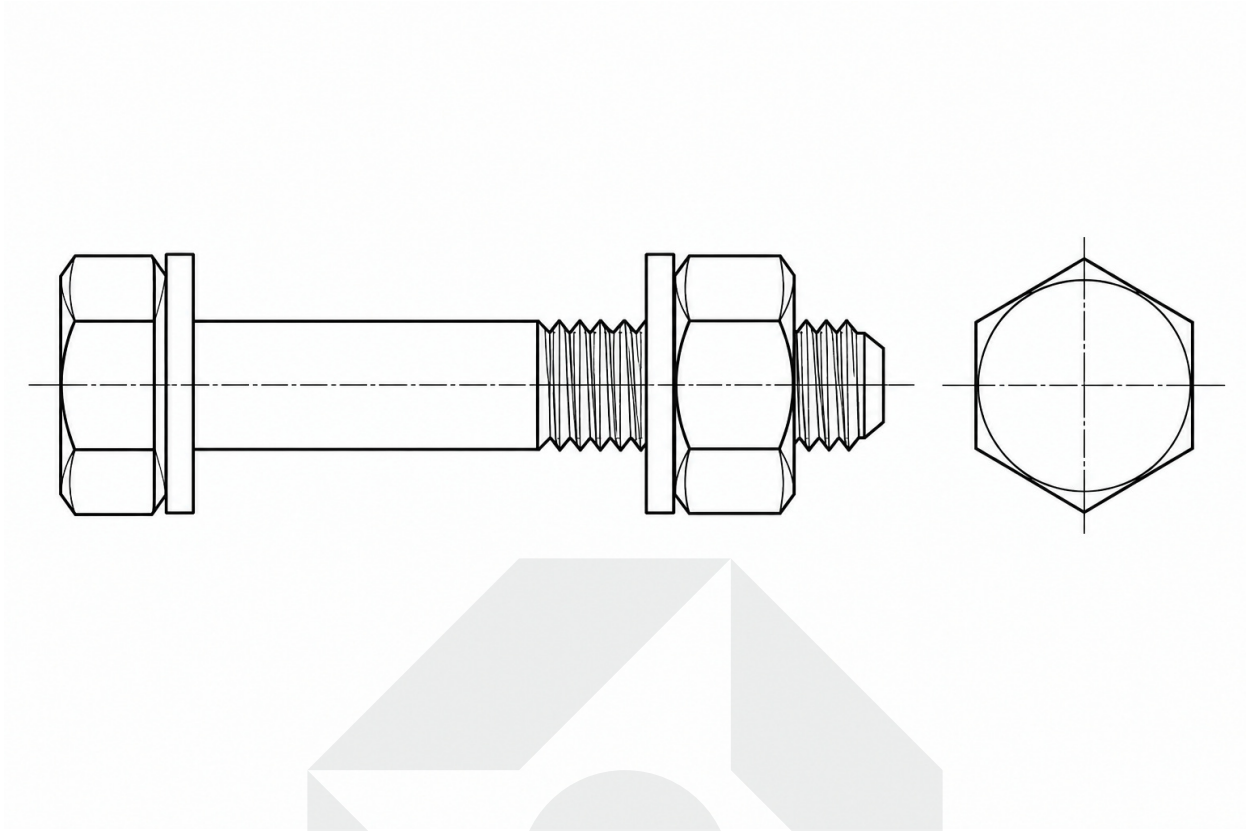
Dueemme product illustration: HV property class 10.9 bolt, HV class |10| nut and H washers. B represents an example manufacturer identifier. Illustrated markings do not replace the documentation for the supplied assembly.

CE marking: packaging and documentation

The assembly CE marking is normally shown on the packaging label. Depending on the lot type and delivery conditions, it may appear in the accompanying documentation, subject to the applicable requirements. It is distinct from individual component markings: manufacturer identification, property class and system identification.

On receipt, check that the assembly, label, lot and Declaration of Performance (DoP) correspond; retain traceability after opening the packaging.

Assembly components



HV assembly: bolt, nut and two washers. Undimensioned technical illustration; does not replace the manufacturing drawing for the supplied product.

HR, HV and HRC: distinct systems

System	Identification	Selection and installation
HR · EN 14399-3	Assembly with HR geometry; property classes specified by Part 3	Specify length, class and washers required for HR
HV · EN 14399-4	10.9 bolt + |10| nut; short thread	Check the permitted grip range carefully
HRC · EN 14399-10	Assembly using a dedicated preload-control system	Requires compatible equipment and installation procedure

Commercial reference sizes · HV 10.9

d	l · mm	P · mm	s · mm	b · mm
M12	30-120	1.75	22	23
M16	35-150	2	27	28
M20	50-170	2.5	32	33
M24	55-160	3	41	39
M27	60-160	3	46	41
M30	80-180	3.5	50	44

d	l · mm	P · mm	s · mm	b · mm
M36	90-200	4	60	52

Other diameters and lengths are available on request. For substantial quantities, dedicated production can be assessed, with feasibility, assembly characteristics and documentation agreed for the specific enquiry.

P = pitch; s = width across flats; b = thread length where shown. Documented catalogue ranges: not every intermediate length is necessarily offered, and these are not Dueemme stock declarations.

This table applies to HV, not HR or HRC. Select length from the assembly grip range, including washers; bolt length is not the same as plate thickness.

Finishes and supply condition

Plain finish

Specify project protection and environmental requirements.

Hot-dip galvanizing

Supply the assembly with compatible, documented coating and check thread fit.

Other coatings

Assess against the system, property class and required testing; do not automatically transfer a finish between assemblies.

Conformity: changes requiring verification

• Do not substitute generic bolts or nuts: assembly identity and traceability must remain verifiable.

• Cutting, rethreading, machining or subsequent treatment may alter declared characteristics. Original documentation does not automatically cover the modified configuration.

• Distinguish assembly CE marking / declaration of performance, factory production control certification and a 3.1 inspection certificate: they serve different purposes.

This does not mean the manufacturer’s entire certification expires: establish whether the supplied or modified assembly remains covered by the relevant declarations, testing and traceability.

K0, K1 and K2: what changes during tightening

The K-class describes assembly torque-preload behaviour in the as-supplied condition. It is not a steel strength grade: 10.9 is the bolt property class, while K0, K1 and K2 concern tightening control.

Class	Characterisation	Practical meaning
K0	No class requirement for the k-factor.	Do not infer an installation torque from K0 alone. Use a method permitted by the execution specification, for example direct tension indicators (DTIs) with a compatible assembly.
K1	$0.10 \leq ki \leq 0.16$	Individual factors lie within the specified interval. Typically used with the combined method: initial torque stage followed by controlled rotation.
K2	$0.10 \leq km \leq 0.23$; $Vk \leq 0.06$	Mean value and scatter are controlled. Supports the torque method using assembly/lot data; may also be used with the combined method under the applicable specification.

k is a dimensionless factor relating torque, preload and diameter; it is not simply the friction coefficient. ki is an individual test result, km the mean and Vk the coefficient of variation.

Agree the class before supply against the installation method specified under EN 1090-2 and the manufacturer's instructions. Request the K-class, relevant tightening data, lot identification and lubrication condition. K2 does not mean a stronger bolt and does not justify a universal torque value.

Preloading, lubrication and reuse

Tightening torque cannot be inferred from "10.9" alone. Installation method, K-class and torque-preload behaviour must match the supplied assembly. K0, K1 and K2 are not bolt strength classes.

Do not add or replace lubricant without supplier instructions: this may change torque-preload behaviour and invalidate the applicability of test results. Do not automatically reuse an assembly after preloading and dismantling; follow applicable requirements and manufacturer instructions.

Project-specific structural fasteners

Cannot find the required size in the regular range? Dueemme can assess dedicated production for substantial quantities, with project-specific dimensions, class, finish, markings and documentation.

Project-specific documentation

Assembly and traceability

Lot, markings, component list and conformity documents relevant to the supply.

EN 10204 3.1 · DoP · CoC

State the required documents. Applicability and availability are confirmed during enquiry review.

Testing and coatings

Dimensional reports, mechanical tests, coating reports and ROCAP where applicable to the specification.

Related standards and components

Bolt and nut for non-preloaded structural connections. Separate washers where required by the project; regular sizes and project-specific production.

A325, A490, DIN 6914/6915/6916 and BS 4395: references for existing project specifications, without automatic equivalence claims.

Application sectors

Steelwork, structures and infrastructure.

Enquiries and supply

Specify standard, grade, dimensions, finish, quantity and required documents. This technical reference sheet does not replace the lot documentation, manufacturer installation instructions or project design.