

AD 550: Stiffness classification for welded beam to column joints

If a bolted beam to column joint is to be classified as “rigid”, practical recommendations are contained in the Green Book on moment-resisting joints (P398). To be classified as rigid, the critical mode for the top row of bolts is to be Mode 3 (bolt resistance is critical rather than modes involving flexure of the plate) and the column web panel shear force must not exceed 80% of the design shear resistance.

This AD provides complementary advice for welded beam to column connections, which in due course will appear in a revised version of the Green Book.

For a welded beam to column connection to be classified as rigid without recourse to calculations or analysis by software, the joint should meet the following requirements:

- Stiffeners, of equal (or greater) width and thickness as the beam flange, should be

provided across the full width of the column web.

- The beam to column flange welds should be of equal strength to the beam flange, and the welds between the stiffeners and the column flange should have an equivalent resistance to the beam flange welds.
- The column web panel shear force must not exceed 80% of the design shear resistance.

Alternatively, by using limited calculations, the following approach may be adopted:

- The detail should satisfy the requirements for welding to unstiffened flanges, or stiffeners aligned with the beam flanges should be provided in the web of the column. Although rules for welding to unstiffened flanges are provided in BS EN 1993-1-8, the UK Connections Group recommend that the

requirements given in clause 6.7.5 of BS 5950 be adopted.

- When stiffeners are required, they should be of equal (or greater) width and thickness as the beam flange, unless smaller stiffeners are proven by calculation.
- The welds to the beam flange should be designed for the applied loads applied over the effective width of the flange, or may be sized to be of equal strength to the beam flange.
- The welds between stiffeners and the column flange should have an equivalent resistance to the beam flange welds.
- The column web panel shear force must not exceed 80% of the design shear resistance.

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New and revised codes and standards

From BSI Updates September 2025

BS EN PUBLICATIONS

BS EN 10378:2025

Welded stainless steel square and rectangular tubes for mechanical and structural engineering and decorative use. Technical delivery conditions.

BS EN ISO 8501-3:2025

Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Preparation grades of welds, edges and other areas with surface imperfections. *supersedes BS EN ISO 8501-3:2007*

CEN EUROPEAN STANDARDS

EN ISO 8501-3:2025

Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Preparation grades of welds, edges and other areas with surface imperfections (ISO 8501-3:2025).

EN ISO 13916:2025

Welding. Measurement of preheating temperature, interpass temperature and preheat maintenance temperature.

ISO PUBLICATIONS

ISO 17662:2025

Welding. Calibration, verification and validation of equipment used for welding, including ancillary activities.

ISO 15613:2025

Specification and qualification of welding procedures for metallic materials. Qualification based on a pre-production welding test.

ISO 13916:2025

Welding. Measurement of preheating temperature, interpass temperature and preheat maintenance temperature.

BS IMPLEMENTATIONS

BS ISO 24251-1:2025

Prevention of hydrogen assisted brittle fracture of high-strength steel components. Fundamentals and measures. *supersedes BS ISO 9587:2007, BS ISO 9588:2007*

NEW WORK STARTED

EN 1993-1-1:2022/A1

Eurocode 3. Design of steel structures. General rules and rules for buildings.

EN 1993-1-3:2024/A1

Eurocode 3. Design of steel structures. Cold-formed members and sheeting.

EN 1993-1-5:2024/A1

Eurocode 3. Design of steel structures. Plated structural elements.

EN 1993-1-8:2024/A1

Eurocode 3. Design of steel structures. Joints.

BRITISH STANDARDS WITHDRAWN

BS EN ISO 8501-3:2007

Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Preparation grades of welds, edges and other areas with surface imperfections. *superseded by BS EN ISO 8501-3:2025*

BS ISO 9587:2007

Metallic and other inorganic coatings. Pretreatment of iron or steel to reduce the risk of hydrogen embrittlement. *superseded by BS ISO 24251-1:2025*

BS ISO 9588:2007

Metallic and other inorganic coatings. Post-coating treatments of iron or steel to reduce the risk of hydrogen embrittlement. *superseded by BS ISO 24251-1:2025*

BRITISH STANDARDS REVIEWED AND CONFIRMED

BS ISO 22410:2020

Corrosion of metals and alloys. Electrochemical measurement of ion transfer resistance to characterise the protective rust layer on weathering steel.

UPDATED BRITISH STANDARDS

BS EN ISO 377:2017+A1:2025

Steel and steel products. Location and preparation of samples and test pieces for mechanical testing.