

AD 504:

Web to flange welds in box sections subject to bending and torsion

SCI has recently been asked about sizing welds between webs and flanges of a fabricated box section subject to applied torsion and bending. This AD note gives guidance on sizing the welds.

The applied torsion is resisted by shear flow round the box section. The constituent plates deform in shear and complementary shear flows develop parallel to the longitudinal axis of the box and are transferred between the plates by the web to flange welds.

The shear flow s round a box section due to a torsion T is given by:

$$s = \frac{T}{2A} \text{ kN/mm}$$

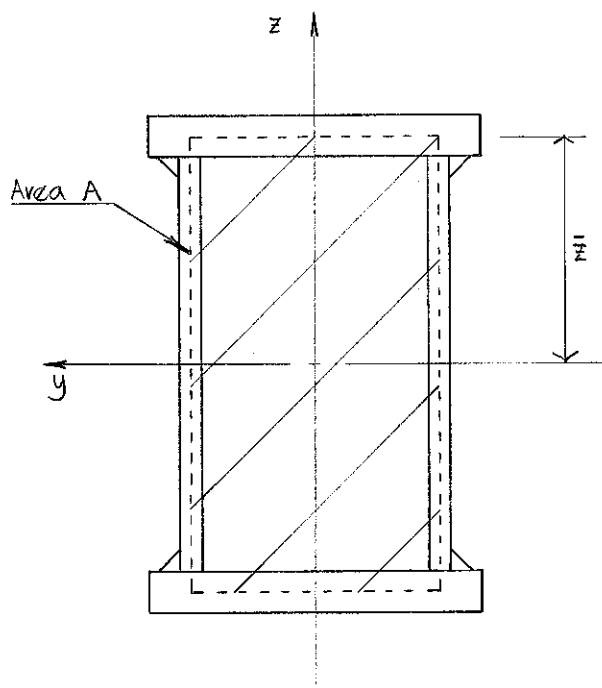
where A is the area enclosed by the mid-line of the flanges and webs as shown in the figure.

The shear flow between the webs and flanges due to bending is given by the standard formula where A_f is the area of the flange where for two webs and shear force V parallel to the z axis:

$$s_b = \frac{VA_f \bar{z}}{2I_y} \text{ kN/mm}$$

The force per mm for sizing the web to flange welds is the sum of the two shear flows:

$$\text{force per mm} = s + s_b \text{ kN/mm}$$



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New and revised codes and standards

From BSI Updates March 2023

BS EN PUBLICATIONS

BS EN ISO 5173:2023

Destructive tests on welds in metallic materials. Bend tests
no current standard is superseded

BRITISH STANDARDS REVIEWED AND CONFIRMED

BS EN 13858:2006

Corrosion protection of metals. Non-electrolytically applied zinc flake coatings on iron or steel components

ISO 21930:2017

Sustainability in buildings and civil engineering works. Core rules for environmental product declarations of construction products and services

NEW WORK STARTED

ISO 834-7

Fire-resistance tests. Elements of building construction. Specific requirements for columns
will supersede None

ISO 14404-3

Calculation method of carbon dioxide emission intensity from iron and steel production. Steel plant with electric arc furnace (EAF) and coal-based or gas-based direct reduction iron (DRI) facility
will supersede BS ISO 14404-3:2017

ISO 15686-1

Buildings and constructed assets. Service life planning. Concepts, Principles and terminology
will supersede None

ISO 15686-2

Buildings and constructed assets. Service life planning. Process considerations
will supersede None

ISO 15686-3

Buildings and constructed assets. Service life planning. Methodologies, data and communication
will supersede None

ISO 19691

Measurement Method of Corrosion for Weathering Steel Structures
will supersede None

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT - ADOPTIONS

23/30450662 DC

BS EN ISO 4172 Technical product documentation (TPD). Construction documentation. Drawings for the assembly of prefabricated structures
Comments for the above document were required by 26 March, 2023

23/30450666 DC

BS EN ISO 7519 Technical product documentation (TPD). Construction documentation. General principles of presentation for general arrangement and assembly drawings
Comments for the above document were required by 26 March, 2023

ISO PUBLICATIONS

ISO 12911:2023

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM). Framework for specification of building information modelling (BIM) implementation
Will be implemented as an identical British Standard

ISO 15610:2023

Specification and qualification of welding procedures for metallic materials. Qualification based on tested welding consumables
Will be implemented as an identical British Standard