AS/NZS 1554.4:1995 Structural steel welding - Part 4: Welding of high strength quenched and tempered steels

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Description

This Standard specifies requirements for the welding of a wide range of welded construction using high strength quenched and tempered steels with a specified minimum yield strength not exceeding 800 MPa.

It applies to statistically loaded structures as well as some welds subject to fatigue conditions, and provides three categories of weld with three differing levels of weld quality assurance associated with different types of service to which the welds are subjected.

Scope

This Standard specifies materials of construction, weld preparations and weld qualities, qualification of welding procedures and welding personnel and fabrication and inspection requirements for welds related to the fusion welding of steelwork in structures made up of combinations of steel plate, sheet or sections, including hollow sections and built-up sections, or castings and forgings, by the following processes:

- (a) Manual metal-arc welding (MMAW).
- (b) Submerged arc welding (SAW).
- (c) Gas metal-arc welding (GMAW), including pulsed mode.
- (d) Flux-cored arc welding (FCAW).
- (e) Electroslag (including consumable guide) welding (ESW);

- (f) Electrogas welding (EGW).

The Standard is limited to the welding of quenched and tempered steel parent material complying with Clause 2.1.

The Standard applies specifically to the welding of steelwork in structures complying with appropriate Standards (see Note below). Where the proportions of welded joints in these structures are governed by dynamic loading conditions, the Standard applies only to those welded joints which comply with the fatigue provisions of AS 3990, as limited by (ii) below, or with the directly equivalent fatigue provisions of other application Standards.

Where the operating temperature is lower than -10°C, special consideration should be given to brittle fracture.

The Standard applies to welded joints which are

- (i) not subject to fatigue conditions; or
- (ii) subject to fatigue conditions; and
  - (A) the stress range in the welded joint complies with the permissible stress range of stress categories C, D, E, or F of AS 3990, or weld categories lower than or equal to detail category 112 of AS 4100 or NZS 3404.1; or
  - (B) the stress range in the welded joint is not more than 80% of the permissible stress range of stress category B of AS 3990, (category SP weld, see Clause 1.5.2); or
  - (C) the stress range in the welded joint is greater than 80% of the permissible stress range for stress category B of AS 3990, or exceeds the stress range permitted for detail category 112 of AS 4100 or NZS 3404.1 (category FP weld, see Clause 1.5.2), but does not exceed the maximum stress ranges permitted for these categories.

In addition to the abovementioned structures, the Standard applies to the welding of cranes, hoists, earthmoving equipment and other dynamically loaded structures, the welding of road and pedestrian bridges and the welding of steelwork in applications other than structural.

The Standard does not apply to the welding of structures by the following processes:

- (1) Oxy-fuel gas welding (GW).
- (2) Gas tungsten arc welding (GTAW).
- (3) Resistance welding (RW).
- (4) Friction welding (FW).
- (5) Thermit welding (TW).

The Standard does not apply to the welding of pressure vessels and pressure piping.

The Standard does not cover thedesignof welded connections andpermissible stresses in welds, or the production and rectification repair of castings.

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This document is CITED BY:

- AS 2159:1995

  AS/NZS 1554.4:1995 is cited by AS 2159:1995 Rules for the design and installation of piling (known as the SAA Piling Code)

- NZS 3404 Parts 1 and 2:1997

  AS/NZS 1554.4:1995 is cited by NZS 3404 Parts 1 and 2:1997 Steel structures standard

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7.4 Non-Destructive Examination Other Than Visual Examination

Appendices

Appendix A - List Of Referenced Documents

Appendix B - A Suitable Form Of Welding Procedure Sheet

Appendix C - Method For Joint And Process Identification

Appendix D - Checklist Of Matters For Discussion

Appendix E - Suggested Extent Of Non-Destructive Examination

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