

**NA to SS EN 1993-1-10:2010(2023)**  
(ICS 91.080.10)

**SINGAPORE STANDARD**

**Singapore National Annex to Eurocode 3 :  
Design of steel structures**

– Part 1-10 : Material toughness and through thickness  
properties

Confirmed 2023

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## **National Foreword**

This National Annex was prepared by the Technical Committee on Building Structure and Sub-structure under the purview of the Building and Construction Standards Committee.

This standard is an adoption of UK National Annex (NA to BS EN 1993-1-10:2005) to Eurocode 3: Design of steel structures – Part 1-10 : Material toughness and through-thickness properties and is implemented with the permission of the British Standards Publishing Ltd.

In preparing this standard, reference was also made to PD 6695-1-9 : 2008 'Recommendations for the design of structures to BS EN 1993-1-10'.

Acknowledgement is made to BSI for the use of information from the above publications.

This Singapore NA contains information on those parameters which are left open in EN 1993-1-10 for national choice, known as nationally determined parameters. The Singapore NA is to be read in conjunction with the SS EN 1993-1-10 : 2010 – Eurocode 3: Design of steel structures – Part 1-10 : Material toughness and through-thickness properties.

Where appropriate, users may refer to the guidance and recommendation in the BC 1:2008 'Design Guide on use of alternative steel material to BS 5950' published by the Building and Construction Authority (BCA). Reference should be made to the most current version as this publication is expected to be replaced by subsequent revisions based on the SS EN 1993 series of standards.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all such patent rights.

### **NOTE**

- 1. Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as "mature standards". Mature standards will not be subject to further review unless there are requests to review such standards.*
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- 3. Compliance with a SS or TR does not exempt users from any legal obligations.*

## Singapore National Annex to SS EN 1993-1-10 : 2010 – Eurocode 3: Design of steel structures – Part 1-10 : Material toughness and through-thickness properties

### NA.1 Scope

This National Annex gives:

- a) the Singapore decisions for the Nationally Determined Parameters described in the following subclauses of SS EN 1993-1-10:2010:
  - 2.2(5)
  - 3.1(1)
- b) references to non-contradictory complementary information.

### NA.2 Nationally determined parameters

#### NA.2.1 Procedure [SS EN 1993- 1-10:2010, 2.2(5)]

##### NA.2.1.1 Safety element

##### NA.2.1.1.1 Factors affecting safety elements

The value of  $\Delta T_R$  should be obtained from the following equation:

$$\Delta T_R = \Delta T_{RD} + \Delta T_{Rg} + \Delta T_{RT} + \Delta T_{R\sigma} + \Delta T_{Rs}$$

where:

$\Delta T_{RD}$  is an adjustment for the detail type (see NA.2.1.1.2);

$\Delta T_{Rg}$  is an adjustment for the gross stress concentrations (see NA.2.1.1.3);

$\Delta T_{RT}$  is an adjustment for Charpy test temperature (see NA.2.1.1.4);

$\Delta T_{R\sigma}$  is an adjustment for the applied stress level (see NA.2.1.1.5);

$\Delta T_{Rs}$  is an adjustment for the strength grade (see NA.2.1.1.6).

The procedures in NA.2.1.1.2 to NA.2.1.1.6 for  $\Delta T_R$  are consistent with  $\Delta T_\sigma = 0$  °C.

Reference to guidance giving recommended maximum permissible values of element thickness  $t$  for reference temperatures below  $-50$  °C is given in NA.3.