

2021 Cycle – International Building Code – Section 722.1

Proponent: Jonathan Humble, American Iron and Steel Institute

Representing: American Institute of Steel Construction

Supplemental Documentation #2

Summary of Revisions in ANSI/AISC 360-22 *Specification for Structural Steel Buildings*

Revisions to Appendix 4 of the 2022 *Specification for Structural Steel Buildings* will consolidate steel-related provisions for fire resistance into one location in order to provide a central and continuing source for the necessary maintenance and future updates of the information. Specific notable changes are further described below:

Consolidation of Steel Assembly Provisions from Other Standards (Section 4.3)

Appendix 4 of the 2022 *Specification* will include prescriptive steel fire protection design equations and related information based on standard ASTM E119 fire tests, which have been previously contained in ASCE-29 and the IBC. The provisions provide acceptable design alternatives to steel construction that are not represented in currently available fire resistance rated assemblies and expands the range of rated assembly applications. The reversion of these provisions back to the custody of AISC and its Committee on Specifications was motivated by the association's and industry's interest in duly maintaining this important content and contributing to its future progress. AISC desired to parallel the development of prescriptive fire resistive criteria for the concrete, masonry, and timber industries that are embodied in separate standards authored by the respective committees.

New Provisions for Additional Steel Assemblies

In addition to the steel systems adopted from ASCE-29 and the IBC, two new systems will also be included in Appendix 4. New provisions include equations that will enable the engineers to determine fire ratings of typical configurations of composite plate shear walls; currently, no such provisions exist. Also, new provisions are provided for calculating the fire resistance rating of composite floor slabs on steel deck; these provisions are based on recent research at the National Institute of Standards and Technology (NIST) and is an improvement over the calculation that can be found in Eurocode.

Revisions to Section 4.2: Structural Design for Fire Conditions by Analysis

This section will contain several revisions that provide clarification and additional direction for using the different methods of analysis. The changes are based on recent work completed by AISC/AISI Task Committee for Fire that focused on a case study that evaluated a structure using both the Simple Method and the Advanced Method. Additionally, a new method is provided in Section 4.2 for calculating the critical temperature at which the member demand exceeds its capacity (as an alternative to back-solving the existing equations that calculate the retained strength in fire if the member temperature is known).

Adoption of Temperature-Dependent Steel Material Properties from Eurocode

The temperature-dependent stress-strain equations from Eurocode will now be provided in the *Specification* so that the user has clearer guidance on what material properties can be used for steel at elevated temperatures. Many users do not have access or familiarity with Eurocode, and this provides a more straight-forward option. It is important to note, however, that the Eurocode equations are not intended to limit or restrict the user from using another acceptable material model.