

**AISI - Cold-Formed Steel Framing
Industry Updates**
(Impact of 2018 IBC)

Presented by:
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Presentation Overview

- Impact of the 2018 IBC
 - Latest AISI Standards and Updates
 - What does the 2018 IBC Reference (What Do I Use?)
 - Future Changes to Expect
- Design Resources for Cold-Formed Steel Framing
 - Manufacturers Literature
 - AISI and ASTM Standards
 - CFS Institutes and Organizations

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Latest AISI Standards

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Overview of AISI Standards and Guides

- AISI S100: North American Specification for the Design of Cold-Formed Steel Structural Members - NASPEC
 - Main Specification
 - Structural Members, Assemblies, Systems, Connections
- AISI CFS Design Manual (D100)
 - Section Property Calculation Examples
 - Member Design Examples
- AISI CFS Design Guide (D110)
 - Full System Design Examples
- AISI CFS Design Manual (D113)
 - Shear Wall Design Guide
- AISI Research Reports available as well



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Framing/Design Standards

2012 Standards:

- AISI S200: General Provisions
- AISI S201: Product Standard
- AISI S202: Code of Standard Practice
- AISI S210: Floor and Roof System Design
- AISI S211: Wall Stud Design
- AISI S212: Header Design
- AISI S213: Lateral Design
- AISI S214: Truss Design
- AISI S220: Nonstructural Members
- AISI S230: Prescriptive Method for One and Two Family Dwellings



Available for free download at: www.AISIStandards.org

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Framing/Design Standards

2015 Editions - Updates and Condensed:

- AISI S202: Code of Standard Practice
- AISI S220: Nonstructural Members
- AISI S230: Prescriptive Method
- AISI S240: Structural Members (S200, S210, S211, S212, S213, S214)
- AISI S400: Seismic Design (S110, S213)

2016 Editions (applying AISC 360 formatting):

- AISI S100: The Specification
- AISI S310: Profiled Steel Diaphragm Panels



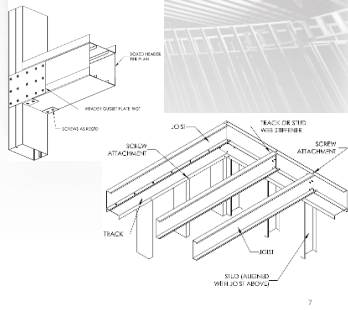
Standards available for download at: www.AISIStandards.org

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S240 – System Design

AISI S240: Structural Members

- AISI S200: General Provisions
- AISI S210: Floor and Roof System Design
- AISI S211: Wall Stud Design
- AISI S212: Header Design
- AISI S213: Lateral Design
- AISI S214: Truss Design



Still Applicable:

- AISI S201: Product Standard
- AISI S202: Code of Standard Practice

So... What do I need to use?

What does the IBC Reference?

- Section 2211 of the 2018 IBC references AISI S240-15
 - Section 2211 is explicitly for cold-formed steel light-frame construction, and makes no reference to AISI S100-16
- AISI S240-15 references AISI S100-12
 - **Therefore for Cold-Formed Steel Framing:**
The same design equations and standards apply as per the 2015 IBC
- Looking ahead: AISI S100-16 references AISI S240 and AISI S400, per Section I4 – Cold-Formed Steel Light-Frame Construction

AISI S240 – Cross Reference Tool

Section Reference Between AISI S240 and AISI S200, S210, S211, S212, S213, and S214

AISI S240 Section	Title	Source Standard	Section
A.	GENERAL	S200 to S214	A
A1	Scope	S200 to S214	A1
A1.1		S200	A1
A1.2		S200 to S214	A1
A1.2(a)		S210	A1
A1.2(b)		S211 and S212	A1
A1.2(c)		S213	A1
A1.2(d)		S214	A1
A1.3		new	
B.	DESIGN	S210 to S212	B
B1	General	new (editorial)	n/a
B1.1	Loads and Load Combinations	S210 to S214	varies
B1.1.1	Live Load Reduction on Wall Studs	new	n/a
B1.1.2	Wind Loading Considerations for Wall Studs in U.S. and Mexico	S211	A3.1
B1.2	Design Basis	S210 and S211	B
		S213 and S214	B1

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- ### Future of the IBC
- If the 2021 IBC adds a reference to AISI S100-16
 - Use S100-16 for the design of Members
 - Use S240-15 for the design of Framing System
 - AISI S100-16 references AISI S240 and AISI S400, per Section I4 – Cold-Formed Steel Light-Frame Construction, so everything stays connected
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News from AISI COFS Committees

Committee on Framing Standards

- ASCE CFS Committee – Looking ahead to possible ballots and revisions (Chapter 13 ballot)
- Education Committee – Continued joint outreach via AISI, CFSEI, CCFSS and others
- Standard Practices – Synchronizing language. No major developments
- Lateral Design (S240) – Continued expansion and addition of developed research into S240
- Framing Design – Continued development of standards. No major revisions
- Code Synchronization Task Group – No major developments. ASTM and AISI are fairly aligned
- Analysis Task Group – No major developments
- Main Committee – Continued Review and Balloting of Subcommittee ballots

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Design Resources for Cold-Formed Steel Framing

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Manufacturer Technical Catalogs

- Member Section Properties
- Allowable Span Tables
 - Interior Wall Heights
 - Composite
 - Non-Composite
- Curtain Wall Heights
- Combined Axial and Lateral
- Floor Joist Spans
- Header Loads
- Web Crippling Loads
- Ceiling Spans
- Connection Capacity Tables

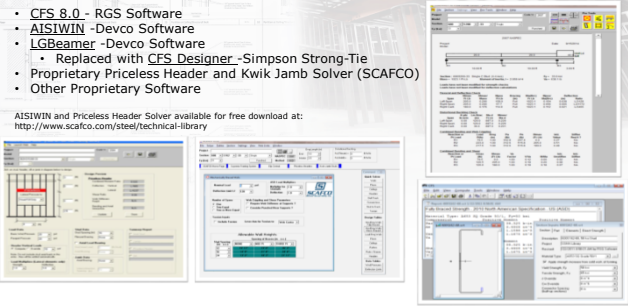


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Design Software

- **CFS 8.0** - RGS Software
- **AISIWIN** - Devco Software
- **LGBeamer** - Devco Software
 - Replaced with **CFS Designer** - Simpson Strong-Tie
- Proprietary Priceless Header and Kwik Jamb Solver (SCAFCO)
- Other Proprietary Software

AISIWIN and Priceless Header Solver available for free download at:
<http://www.scafco.com/steel/technical-library>



Useful Links for CFS

- Cold-Formed Steel Engineers Institute
 - www.cfsei.org
 - Many Tech Notes available
- American Iron and Steel Institute (AISI)
 - www.steel.org
 - Research Reports
 - Clips, Shear Walls, etc...
- Wei-Wen Yu Center for Cold-Formed Steel Structures
 - www.ccfss.org



ASTM Specifications

- **A653** – Specification for Galvanized Sheet Steel – Thicknesses, Coatings, Standards, etc...
- **A1003** – Specification for Coated Cold-Formed Framing Members – Zinc coated, Metallic Coated, Nonmetallic Coated, etc...
- **C645** – Specification for Nonstructural Steel Framing Members – Interior Studs, Tracks, Hat/Furring Channel, Section Properties, etc...
- **C754** – Specification for Installation of Steel Framing Members to Receive Gypsum Panel Products – Interior Studs, Tracks, Hat/Furring Channel, Resilient Channel, Wall Heights, etc...
- **C955** – Specification for Load Bearing Steel Studs, Tracks, etc...
- **C1007** – Specification for Installation of Load Bearing Steel Studs



Thank You

For more information contact:
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If time allows....

Review of Structural Systems And Standards

Shear Walls

References: AISI S240-15, S400-15, and D113

Options with CFS Framing:

- Wood Structural Panel
- Steel Sheet Sheathing
 - 18, 27, 30, 33mil thickness tables available
- Steel Strap Brace
- Combination of Wood and GWB
- GWB or Fiber Board

Table 9B.2.3-3a
 Steel Stud Wall Shear Strength (kips/ft)^{1,2,3,4}
 For Shear Walls with Steel Sheet Sheathing or the Size of Wall
 CFSF Steel Stud Wall

Sheathing	Weld Area (in ² /ft)	Fretwork Spacing (in)			Steel Strapping Spacing	Orientation of Stud, Fret and Sheathing (in)	Required Sheathing Spacing (in)
		2/12	4/12	2/12			
0.172	0.2	-	-	-	No	15.0(16)	A
0.222	0.2	4/12	2/12	2/12	No	45.0(48)	A
0.222	0.2	4/12	2/12	2/12	No	35.0(36)	B
0.222	0.2	4/12	2/12	2/12	No	33.0(34)	B
0.222	0.2	4/12	2/12	2/12	No	31.0(32)	B
0.222	0.2	4/12	2/12	2/12	No	29.0(30)	B
0.222	0.2	4/12	2/12	2/12	No	27.0(28)	B
0.222	0.2	4/12	2/12	2/12	No	25.0(26)	B
0.222	0.2	4/12	2/12	2/12	No	23.0(24)	B
0.222	0.2	4/12	2/12	2/12	No	21.0(22)	B
0.222	0.2	4/12	2/12	2/12	No	19.0(20)	B
0.222	0.2	4/12	2/12	2/12	No	17.0(18)	B
0.222	0.2	4/12	2/12	2/12	No	15.0(16)	B
0.222	0.2	4/12	2/12	2/12	No	13.0(14)	B
0.222	0.2	4/12	2/12	2/12	No	11.0(12)	B
0.222	0.2	4/12	2/12	2/12	No	9.0(10)	B
0.222	0.2	4/12	2/12	2/12	No	7.0(8)	B
0.222	0.2	4/12	2/12	2/12	No	5.0(6)	B
0.222	0.2	4/12	2/12	2/12	No	3.0(4)	B
0.222	0.2	4/12	2/12	2/12	No	1.0(2)	B
0.222	0.2	4/12	2/12	2/12	No	0.5(1)	B
0.222	0.2	4/12	2/12	2/12	No	0.2(0.5)	B
0.222	0.2	4/12	2/12	2/12	No	0.1(0.2)	B
0.222	0.2	4/12	2/12	2/12	No	0.05(0.1)	B
0.222	0.2	4/12	2/12	2/12	No	0.02(0.05)	B
0.222	0.2	4/12	2/12	2/12	No	0.01(0.02)	B
0.222	0.2	4/12	2/12	2/12	No	0.005(0.01)	B
0.222	0.2	4/12	2/12	2/12	No	0.002(0.005)	B
0.222	0.2	4/12	2/12	2/12	No	0.001(0.002)	B
0.222	0.2	4/12	2/12	2/12	No	0.0005(0.001)	B
0.222	0.2	4/12	2/12	2/12	No	0.0002(0.0005)	B
0.222	0.2	4/12	2/12	2/12	No	0.0001(0.0002)	B
0.222	0.2	4/12	2/12	2/12	No	0.00005(0.0001)	B
0.222	0.2	4/12	2/12	2/12	No	0.00002(0.00005)	B
0.222	0.2	4/12	2/12	2/12	No	0.00001(0.00002)	B
0.222	0.2	4/12	2/12	2/12	No	0.000005(0.00001)	B
0.222	0.2	4/12	2/12	2/12	No	0.000002(0.000005)	B
0.222	0.2	4/12	2/12	2/12	No	0.000001(0.000002)	B
0.222	0.2	4/12	2/12	2/12	No	0.0000005(0.000001)	B
0.222	0.2	4/12	2/12	2/12	No	0.0000002(0.0000005)	B
0.222	0.2	4/12	2/12	2/12	No	0.0000001(0.0000002)	B
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0.222	0.2	4/12	2/12	2/12	No	0.00000002(0.00000005)	B
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0.222	0.2	4/12	2/12	2/12	No	0.0000000002(0.0000000005)	B
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0.222	0.2	4/12	2/12	2/12	No	0.000000000001(0.000000000002)	B
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0.222	0.2	4/12	2/12	2/12	No	0.0000000000001(0.0000000000002)	B
0.222	0.2	4/12	2/12	2/12	No	0.00000000000005(0.0000000000001)	B
0.222	0.2	4/12	2/12	2/12	No	0.00000000000002(0.00000000000005)	B
0.222	0.2	4/12	2/12	2/12	No	0.00000000000001(0.00000000000002)	B
0.222	0.2	4/12	2/12	2/12	No	0.000000000000005(0.00000000000001)	B
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0.222	0.2	4/12	2/12	2/12	No	0.000000000000001(0.000000000000002)	B
0.222	0.2	4/12	2/12	2/12	No	0.0000000000000005(0.000000000000001)	B
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0.222	0.2	4/12	2/12	2/12	No	0.00000000000000002(0.00000000000000005)	B
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0.222	0.2	4/12	2/12	2/12	No	0.00000000000000000000005(0.0000000000000000000001)	B
0.222	0.2	4/12	2/12	2/12	No	0.00000000000000000000002(0.00000000000000000000005)	B
0.222	0.2	4/12	2/12	2/12	No	0.00000000000000000000001(0.00000000000000000000002)	B
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0.222	0.2	4/12	2/12	2/12	No	0.000000000000000000000000002(0.000000000000000000000000005)	B
0.222	0.2	4/12	2/12	2/12	No	0.000000000000000000000000001(0.000000000000000000000000002)	B
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Shear Walls

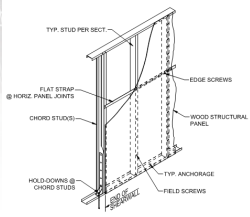
References: AISI S240-15, S400-15, and D113

Type of Shear Wall (Type 1 or Type 2 or Hybrid?)

- Consideration for openings

Design Considerations:

- Chords/Posts/Jambs
- Hold-downs
- Anchors
- Collectors
- Connections/Splices



Exterior Walls

References: AISI S100-12, S240-15, and D110

Combined Lateral and Axial Loading Considerations:

- Loading of the member
- The member length
- The member end restraint
- Bracing conditions
- Location of applied eccentric loads
- The shape and dimensions of the cross-section
 - open vs. closed, and symmetry

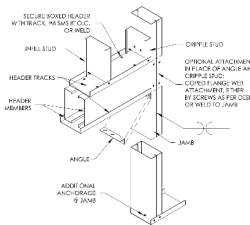


Boxed and Built-Up Members

References: AISI S100-12, S240-15, and D110

Design Elements and Considerations:

- Boxed Headers and Boxed Jambs
 - Sum of individual member section properties in the applicable axis per D110
- Boxed Studs/Jambs
 - Assuring load transfer to all members - design accounts for equal transfer only
- Stud Packs vs. HSS



Boxed and Built-Up Members

