



Expanding Your Solutions

Corporate Headquarters
13191 Crossroads Pkwy N., Ste 325
City of Industry, CA 91746
Phone: 800.775.2362
Fax: 626.330.7598
www.cemcosteel.com

Manufacturing Facilities
City of Industry, CA
Ft. Worth, TX
Henderson, CO
Pittsburg, CA

Structural Engineering/Design
1001-A Pittsburgh Antioch Hwy
Pittsburg, CA 94565
Phone: 800.775.2362
Fax: 626.330.7598
www.cemcoengineering.com

Technical Services
13191 Crossroads Pkwy N., Ste 325
City of Industry, CA 91746
Phone: 800.416.2278
Fax: 626.249.5004

400VS125-18-70 (20EQ) VIPERSTUD

Geometric Properties

4" x 1-1/4" flange, 18 mil ViperStuds are manufactured from standard G40 hot-dipped galvanized steel. G60 and G90 coatings are available through special order, and may require up-charges and extended lead times.

Steel Thickness

Model No.	Design Thickness (in)	Minimum Thickness (in)	Yield (ksi)	"W" Web Sizes (in)	Coating ^{4,5}	Flange (in)	"L" Return Lip (in)
400VS125-18-70 (20EQ)	0.0190	0.0181	70	4	G40	1-1/4	.338

Notes: 1. Uncoated steel thickness. Thickness is for carbon sheet steel. 2. Minimum thickness represents 95% of the design thickness and is the minimum acceptable thickness. 3. Knockout size for 4" Stud is 1-1/2" x 2-1/2". 4. Per ASTM C645 & A1003, Table 1. 5. G60 and G90 available upon request. Will require extended lead time and upcharge.

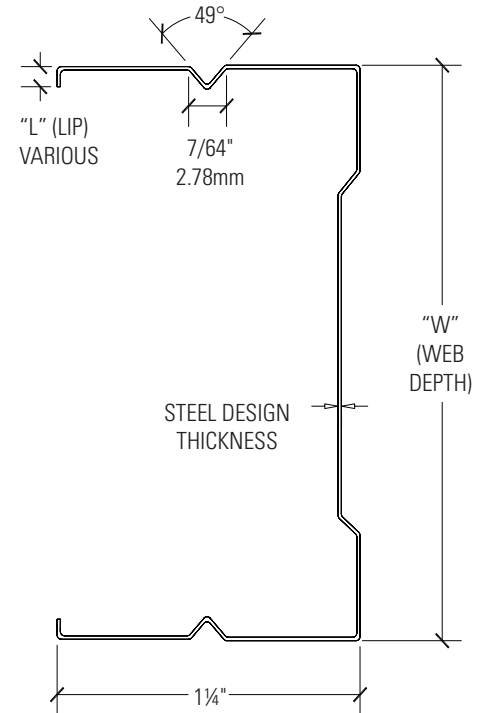
Color Code (painted on ends): 18 mil: None

ASTM & Code Standards:

- ASTM A653/A653M, A924/A924M, A1003/1003, C645 & C754
- ICC-ES & SFIA Code Compliance Certification Program
- ICC ESR-2620 ■ CBC: 2016, 2019, 2022
- IBC: 2015, 2018, 2021 ■ AISI: S100, S220

LEED v4 for Building and Design Construction

- MR Prerequisite: Construction and Demolition Waste Management Planning.
- MR Credit: Construction and Demolition Waste Management.
- MR Credit: Building Product Disclosure and Optimization – Sourcing of Raw Materials, Option 2.
- MR Credit: Building Product Disclosure and Optimization – Environmental Product Declarations, Options 1 & 2.
- MR Credit: Building Product Disclosure and Optimization – Material Ingredients, Option 1.
- MR Credit: Building Life-Cycle Impact Reduction, Option 4.



400VS125-18-70 (20EQ) ViperStud Properties

Design (in)	Min (in)	Yield (ksi)	Weight (lb/ft)	Gross Properties					Effective Properties		Moment				Critical Unbraced Length Lu (in)
				Area (in ²)	Ix (in ⁴)	Iy (in ⁴)	rx (in)	ry (in)	Ixd (in ⁴)	Sx (in ³)	Allowable Moment Ma (in-k)	Local Buckling Nominal Moment Mnl (in-k)	Distortional Buckling Nominal Moment Mnd (in-k)	Nominal Moment for Conventional Studs Mn (in-k)	
0.0190	0.0181	70	0.449	0.132	0.315	1.550	0.0266	0.449	0.265	0.085	3.44	5.93	5.74	5.74 (30 mil)	21.5

Notes: 1. Nominal Moments for Viper25 are based on testing. Allowable moment (Ma) is calculated with safety factor of 1.81 in accordance with chapter F of AISI S100-16/S2-20 specification. 2. Nominal moment for Viper20, Viper 30mil, Viper 33mil and conventional studs are based on calculations per AISI S100-16/S2-20. 3. Section properties are in accordance with AISI S100-16/S2-20. 4. Web depth-to-thickness ratio exceeds 200. 5. Web depth-to-thickness ratio exceeds 260. 6. ViperStud is considered fully braced when the unbraced length is less than listed Lu. 7. K_D assumed to be zero for distortional buckling moments.

Non-Composite Limiting Heights – Braced at 48" O.C.

Depth (in)	Gauge	Member Designation	Design (in)	Min (in)	Yield (ksi)	Spacing (o.c.)	5 PSF			7.5 PSF			10 PSF		
							L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
4	20EQ	400VS125-18-70 (20EQ)	0.0190	0.0181	70	12	18'-1"	15'-1"	13'-2"	14'-10"	13'-2"	11'-7"	12'-10"	12'-0"	10'-6"
		400VS125-18-70 (20EQ)	0.0190	0.0181	70	16	15'-8"	13'-10"	12'-0"	12'-10"	12'-0"	10'-6"	11'-1"	10'-11"	9'-6"
		400VS125-18-70 (20EQ)	0.0190	0.0181	70	24	12'-10"	12'-0"	10'-6"	10'-6"	10'-6"	9'-2"	9'-1"	9'-1"	8'-4"

Notes: 1. Limiting heights are in accordance with AISI S100-16/S2-20 using all steel non-composite design. 2. Limiting heights are established by considering flexure, shear, web crippling and deflection. 3. Lateral-Torsional buckling moments are based on section F of AISI S100-16/S2-20, with max discrete bracing of 48" o.c. 4. For web crippling, when h/t ≤ 200, the web crippling values are computed based on section G6 of AISI S100-16/S2-20, when h/t > 200, the web crippling values are based on testing with a bearing length of 1".

5. No web stiffeners are required for studs with h/t < 200, web crippling and shear values have been confirmed by testing. 6. The factory punchouts are in accordance with AISI standards. The distance from the center of the last punchout to the end of the stud is 12". 7. Use non-composite tables when 1/2 inch gypsum board, horizontal board, RC channel, furring channel, or sound clips are used. 8. Review fire rated assemblies for additional requirements.

"f" - flexure controls; "s" - shear controls; "w" - web crippling controls. No letter next to the number means deflection controls.



Expanding Your Solutions

Corporate Headquarters
 13191 Crossroads Pkwy N., Ste 325
 City of Industry, CA 91746
 Phone: 800.775.2362
 Fax: 626.330.7598
 www.cemcosteel.com

Manufacturing Facilities
 City of Industry, CA
 Denver, CO
 Ft. Worth, TX
 Pittsburg, CA

Structural Engineering/Design
 1001-A Pittsburgh Antioch Hwy
 Pittsburg, CA 94565
 Phone: 800.775.2362
 Fax: 626.330.7598
 www.cemcoengineering.com

Technical Services
 13191 Crossroads Pkwy N., Ste 325
 City of Industry, CA 91746
 Phone: 800.416.2278
 Fax: 626.249.5004

400VS125-18-70 (20EQ) VIPERSTUD

PAGE 2

Non-Composite Limiting Heights – Fully Braced

Depth (in)	Gauge	Member Designation	Design (in)	Min (in)	Yield (ksi)	Spacing (o.c.)	5 PSF			7.5 PSF			10 PSF		
							L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
4	20EQ	400VS125-18-70 (20EQ)	0.0190	0.0181	70	12	19'-1"	15'-1"	13'-2"	16'-8"	13'-2"	11'-7"	15'-1"	12'-0"	10'-6"
		400VS125-18-70 (20EQ)	0.0190	0.0181	70	16	17'-4"	13'-10"	12'-0"	15'-1"	12'-0"	10'-6"	13'-1"	10'-11"	9'-6"
		400VS125-18-70 (20EQ)	0.0190	0.0181	70	24	15'-1"	12'-0"	10'-6"	12'-5"	10'-6"	9'-2"	10'-8"	9'-6"	8'-4"

Notes: **1.** Limiting heights are in accordance with AISI S100-16/S2-20 using all steel non-composite design. **2.** Limiting heights are established by considering flexure, shear, web crippling, and deflection. **3.** For bending, studs are assumed to be adequately braced to develop full allowable moment. Studs are considered fully braced when unbraced length is less than the L_u . See section properties table on page 5 for L_u values. **4.** For web crippling, when $h/t \leq 200$, the web crippling values are computed based on section G6 of AISI S100-16/S2-20, when h/t

> 200 , the web crippling values are based on testing with a bearing length of 1". **5.** No web stiffeners are required for studs with $h/t < 200$, web crippling and shear values have been confirmed by testing. **6.** The factory punchouts are in accordance with AISI standards. The distance from the center of the last punchout to the end of the stud is 12". **7.** Use non-composite tables when 1/2 inch gypsum board, horizontal board, RC channel, furring channel, or sound clips are used. **8.** Review fire rated assemblies for additional requirements.

"f" - flexure controls; "s" - shear controls; "w" - web crippling controls. No letter next to the number means deflection controls.

Allowable Composite Heights for Non-Load Bearing Walls

Depth (in)	Gauge	Member Designation	Design (in)	Min (in)	Yield (ksi)	Spacing (o.c.)	5 PSF			7.5 PSF			10 PSF		
							L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
4	20EQ	400VS125-18-70 (20EQ)	0.0190	0.0181	70	12	22'-11"	18'-11"	16'-8"	20'-0"	16'-7"	14'-7"	18'-2"	15'-1"	13'-3"
		400VS125-18-70 (20EQ)	0.0190	0.0181	70	16	20'-10"	17'-3"	15'-2"	18'-2"	15'-1"	13'-3"	16'-6"	13'-8"	12'-1"
		400VS125-18-70 (20EQ)	0.0190	0.0181	70	24	18'-2"	15'-1"	13'-3"	15'-10"	13'-2"	11'-7"	14'-5"	11'-11"	10'-5"

Notes: **1.** Sheathing, as specified in Section 3.2.2, must be attached to both faces of the wall for the full height of the wall with the long dimension parallel to the studs. **2.** Sheathing must be fastened to the studs with fasteners as specified in Section 3.2.3 and installed per Section 4.2.1. **3.** Placement of joints in the gypsum sheathing must be in accordance with Sections 4.6.3 and 4.6.4 of GA-216 or Section 7.5 of ASTM C840. **4.** The bottom and top tracks are xxxVT125 (solid flange

track). A minimum 30 mil slotted flange track (xxxCST250 or xxxSLT250) may be used for the top track. **5.** End-bearing must be a minimum of 1 inch for xxxVT125 (solid flange track) and 1-5/8 inches for xxxCST250 or xxxSLT250 (slotted flange track). **6.** Notes 1, 2, & 3 are referenced in ICC ESR 2620 page 5. **7.** For any other top tracks not listed in note 4, please contact technical services for assistance. **8.** For GWB installed horizontally, see table for "Non-Composite Limiting Heights- Fully

Braced" (see above).

CEMCO cold-formed steel framing products contain 30% to 37% recycled steel.

■ Total Recycled Content: 36.9% ■ Post-Consumer: 19.8% ■ Pre-Consumer: 14.4%

CSI Division:

■ 09.22.16 – Non-Structural Metal Framing

Check the updated list of Certified Production Facilities at Intertek's website at <http://www.intertek.com/building/sfia>



This technical information reflects the most current information available and supersedes any and all previous publications effective February 20, 2024.

02/20/2024 AT