

## 400PDS125-18-P (70ksi, G40EQ, Punched)

### 4" ProSTUD® 20 (18mil) Drywall Stud with PDS125 (1-1/4") flange

**Coating:** G40EQ

**Color Code:** Brown

### Geometric Properties

<b>Web depth:</b> 4.000 in	<b>Design Thickness:</b> 0.0190 in
<b>Flange width:</b> 1.250 in	<b>Minimum thickness:</b> 0.0181 in
<b>Stiffening lip:</b> 0.340 in	<b>Yield strength, Fy:</b> 70 ksi

#### Gross Section Properties of Full Section, Strong Axis

Cross sectional area (A)	0.133 in <sup>2</sup>
Member weight per foot of length	0.454 lb/ft
Moment of inertia (Ix)	0.321 in <sup>4</sup>
Radius of gyration (Rx)	1.551 in
Gross moment of inertia (Iy)	0.027 in <sup>4</sup>
Gross radius of gyration (Ry)	0.453 in

#### Effective Section Properties, Strong Axis

Effective Area (Ae)	0.046 in <sup>2</sup>
Moment of inertia for deflection (Ixe)	0.286 in <sup>4</sup>
Section modulus (Sxe)	0.084 in <sup>3</sup>
Allowable bending moment (Ma)	3,532 in-lbs
Allowable shear force in web (Unpunched section) (Vag)	157 lb
Allowable shear force in web (Punched section) (Vanet)	157 lb

#### Torsional Properties

St. Venant torsional constant (J x 1000)	0.0160 in <sup>4</sup>
Warping constant (Cw)	0.089 in <sup>6</sup>
Distance from shear center to neutral axis (Xo)	-0.859 in
Radii of gyration (Ro)	1.830 in
Torsional flexural constant (Beta)	0.780
Unbraced length (Lu)	24.2 in

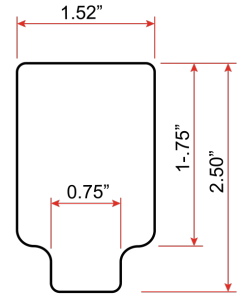
- Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI A3.3.2 of AISI S100-16 (2020) w/S2-20.
- Tabulated gross properties, including torsional properties, are based on full-unreduced cross section of the studs, away from punchouts.
- For deflection calculations, use the effective moment of inertia.
- Allowable moment includes cold work of forming.
- Allowable moment is taken as the lowest value based on local or distortional buckling. Distortional buckling strength is based on a  $k\text{-}\phi = 0$ .

### Code Approvals & Performance Standards

- [AISI S100-16 \(2020\) w/S2-20](#) North American Specification for the Design of Cold-Formed Steel Structural Members
- [AISI S220-20](#) North American Standard for Cold-Formed Steel Framing - Nonstructural Members
  - (Compliant to ASTM C645, but IBC replaced with AISI S220 in IBC 2015)
  - Section A3 Material - Chemical & mechanical requirements (Referencing ASTM A1003/A1003M)
  - Section A4 Corrosion Protection (Referencing ASTM A653/A653M)
  - Section A5 Products - Thickness, shapes, tolerances, identification
  - Section C Installation - (Referencing ASTM C754)
- [AISI S202-20](#) Code of Standard Practice for Cold-Formed Steel Structural Framing
  - Section F3 Delivery, Handling and Storage of Materials
- [ASTM E72](#) Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- [ASTM E90](#) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- [ASTM E119](#) Standard Test Methods for Fire Tests of Building Construction and Materials
- [IBC 2024](#) International Building Code
- [Intertek CCR-0207](#) Non-Structural Metal Framing
- [LA RR #26019](#) City of Los Angeles ProSTUD Research Report
- [UL Designs 263](#) "Fire Tests of Building Construction and Materials"
- [UL File Number R26512](#) Full list of ProSTUD and ProTRAK UL design assemblies
- [SDS For ASTM A1003 Steel Framing Products](#) For Interior Framing, Exterior Framing and Clips/Accessories



- Embossments in web are only placed on sections 2-1/2" and wider.
- U.S. Patent No. 9,010,070



#### Non-Structural Punchout

##### East Coast / Central punch spacing:

Center of punchouts are  
12" from lead end, then 48" o.c.

##### West Coast punch spacing:

Center of punchouts are  
24" from lead end, then 24" o.c.

Center of tail end punchout not less  
than 12" from end of stud.

If custom punchout patterns are required,  
contact ClarkDietrich Sales or local plant for requests.

**Sustainability Credits** For more details and LEED letters contact Technical Services at 888-437-3244 or visit [clarkdietrich.com/LEED](http://clarkdietrich.com/LEED).

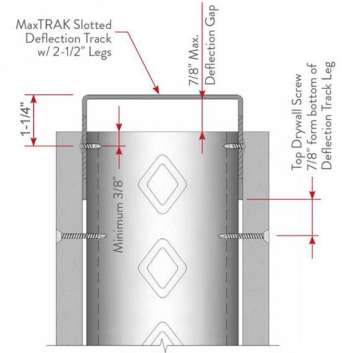
- **LEED v4.1 MR Credit:** Environmental Product Declarations: EPD (1 point) - Sourcing of Raw Materials (up to 2 points) - Material Ingredients (1 point) - Construction and Demolition Waste Management (up to 2 points)
- **LEED v4 MR Credit:** Building Product Disclosure and Optimization: EPD (1 point) - Sourcing of Raw Materials (1 point) - Material Ingredients (1 point) - Construction and Demolition Waste Management (up to 2 points) - Innovation Credit (up to 2 points).

**4" ProSTUD 20 (18mil 70ksi) Drywall Stud - Head-of-Wall (HOW) Composite Limiting Heights**
**With 30mil 2-1/2" Leg MaxTRAK + (1 layer) 5/8" Type X Gypsum Board each side**

Spacing (inches)	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
12	22'-5"	18'-8"	16'-4"	19'-7"	16'-4"	14'-3"	17'-10"	14'-10"	13'-0"
16	21'-0"	17'-7"	15'-4"	18'-4"	15'-4"	13'-5"	16'-8"	13'-11"	12'-2"
24	18'-11"	15'-10"	13'-10"	16'-6"	13'-10"	12'-1"	14'-4" f	12'-6"	10'-6"

Allowable HOW composite limiting heights were tested in accordance with AISI S916 and ICC-ES AC86.

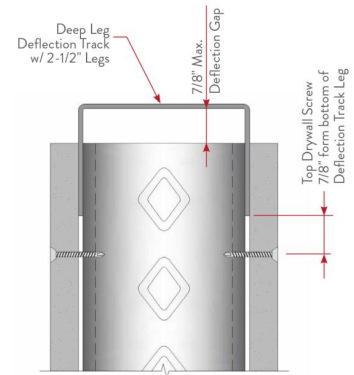
- The tests were modified from the standards with the tracks fastened to the test fixture such that the wall stiffness included the track deformation.
- In accordance with current building codes and AISI design standards, the 1/3 Stress Increase for strength was not used.
- The composite limiting heights provided in the tables are based on a single layer of 5/8" Type X Gypsum Board from the following manufacturers: American, CertainTeed, Georgia Pacific, Continental, National, PABCO, and USG.
- The gypsum board must be applied full height in the vertical orientation to each stud flange and installed in accordance with ASTM C754 using minimum No. 6 Type S Drywall screws spaced as listed below:
  - Sheathing screws spaced a maximum of 16 in on-center to framing members (including bottom track) when studs spaced at 16 in or 12 in on-center.
  - Sheathing screws spaced a maximum of 12 in on-center to framing members (including bottom track) when studs spaced at 24 in on-center.
- #8 wafer head screws shall be used for attaching the stud to 30mil 2-1/2" Leg MaxTRAK (as top track) adhering to details below:
  - Stud to track connection must be installed as depicted in figure with a maximum gap of 7/8" between the web of the MaxTRAK and end of stud.
  - Slots in the MaxTRAK Legs allows for a total vertical movement of 1-1/2" (+/- 3/4") with screw centered in slots.
  - Screws shall be placed in each flange of the stud at a minimum of 3/8" from the end of the stud.
  - To permit head of wall deflection, gypsum board must not be fastened directly to the MaxTRAK.
- No fasteners are required for attaching the stud to the bottom track except as detailed in ASTM C
- f: Adjacent to the height value indicates that flexural stress controls the allowable wall height.


**4" ProSTUD 20 (18mil 70ksi) Drywall Stud - Head-of-Wall (HOW) Composite Limiting Heights**
**With 30mil 2-1/2" Deep Leg Deflection Track + (1 layer) 5/8" Type X Gypsum Board each side**

Spacing (inches)	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
12	22'-5"	18'-7"	16'-4"	19'-7"	16'-3"	14'-3"	17'-10"	14'-9"	12'-11"
16	20'-10"	17'-3"	15'-2"	18'-3"	15'-1"	13'-3"	16'-7"	13'-9"	12'-1"
24	18'-7"	15'-5"	13'-6"	16'-3"	13'-6"	11'-9"	14'-2" f	12'-3"	10'-2"

Allowable HOW composite limiting heights were tested in accordance with AISI S916 and ICC-ES AC86.

- The tests were modified from the standards with the tracks fastened to the test fixture such that the wall stiffness included the track deformation.
- In accordance with current building codes and AISI design standards, the 1/3 Stress Increase for strength was not used.
- The composite limiting heights provided in the tables are based on a single layer of 5/8" Type X Gypsum Board from the following manufacturers: American, CertainTeed, Georgia Pacific, Continental, National, PABCO, and USG.
- The gypsum board must be applied full height in the vertical orientation to each stud flange and installed in accordance with ASTM C754 using minimum No. 6 Type S Drywall screws spaced as listed below:
  - Sheathing screws spaced a maximum of 16 in on-center to framing members (including bottom track) when studs spaced at 16 in or 12 in on-center.
  - Sheathing screws spaced a maximum of 12 in on-center to framing members (including bottom track) when studs spaced at 24 in on-center.
- No fasteners are required for attaching the stud to the Deflection Track at the top except as detailed in ASTM C754:
  - Stud to track connection must be installed as depicted in figure with a maximum gap of 7/8" between the web of the Deflection Track and end of stud.
  - To permit head of wall deflection, gypsum board must not be fastened directly to the Deflection Track.
- No fasteners are required for attaching the stud to the bottom track except as detailed in ASTM C754.
- A Spazzer Spacing Bar (or bridging & bracing) shall be installed in the punchouts immediately adjacent to the top Deflection Track to hold studs in place.
- f: Adjacent to the height value indicates that flexural stress controls the allowable wall height



**4" ProSTUD 20 (18mil 70ksi) Drywall Stud - FULL COMPOSITE Limiting Heights (AC86-2019)**
**With 1-1/4" leg non-deflection track + (1 layer) 5/8" Type X Gypsum Board each side**

Spacing (inches)	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
12	22'-9"	18'-8"	16'-4"	19'-11"	16'-4"	14'-3"	18'-1"	14'-10"	13'-0"
16	21'-4"	17'-7"	15'-4"	18'-8"	15'-4"	13'-5"	16'-11"	13'-11"	12'-2"
24	19'-3"	15'-10"	13'-10"	16'-7" f	13'-10"	12'-1"	14'-4" f	12'-6"	10'-9"

Allowable composite limiting heights were tested in accordance with AISI S916 and ICC-ES AC86.

- Additional composite wall testing and analysis requirements of the SFIA Code Compliance Certification Program were also observed.
- In accordance with current building codes and AISI design standards, the 1/3 Stress Increase for strength was not used.
- The composite limiting heights provided in the tables are based on a single layer of 5/8" Type X gypsum board from the following manufacturers: American, CertainTeed, Georgia Pacific, Continental, National, PABCO, and USG.
- The gypsum board must be applied full height in the vertical orientation to each stud flange and installed in accordance with ASTM C754 using minimum No. 6 Type S Drywall screws spaced as listed below:
- Screws spaced a maximum of 16 in on-center to framing members (including top & bottom track) spaced at 16 in or 12 in on-center.
- Screws spaced a maximum of 12 in on-center to framing members (including top & bottom track) spaced at 24 in on-center.
- No fasteners are required for attaching the stud to the track except as detailed in ASTM C754.
- Stud end bearing must be a minimum of 1 inch.
- f: Adjacent to the height value indicates that flexural stress controls the allowable wall height.
- s: Adjacent to the height value indicates that shear/end reaction controls the allowable wall height.

**4" ProSTUD 20 (18mil 70ksi) Drywall Stud - NON-COMPOSITE Limiting Heights (FULLY BRACED)**

Spacing (inches)	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
12	19'-7"	15'-6"	13'-7"	17'-1"	13'-7"	11'-10"	15'-4"	12'-4"	10'-9"
16	17'-9"	14'-1"	12'-4"	15'-4"	12'-4"	10'-9"	13'-3"	11'-2"	9'-9"
24	15'-4"	12'-4"	10'-9"	12'-6"	10'-9"	9'-5"	10'-10"	9'-9"	8'-7"

- Heights are based on AISI S100-16 (2020) w/S2-20, North American Specification, and AISI S220-20, North American Standard for Cold-Formed Steel Framing - Nonstructural Members, using steel properties alone.
- Above listed Non-Composite Limiting Heights are applicable when the unbraced length is less than or equal to  $L_u$ .
- Heights are limited by moment, deflection, shear, and web crippling (assuming 1" end reaction bearing).

**4" ProSTUD 20 (18mil 70ksi) Drywall Stud - NON-COMPOSITE Limiting Heights (BRACED at 48" o.c.)**

Spacing (inches)	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
12	16'-3"	15'-6"	13'-7"	13'-3"	13'-3"	11'-10"	11'-6"	11'-6"	10'-9"
16	14'-1"	14'-1"	12'-4"	11'-6"	11'-6"	10'-9"	9'-11"	9'-11"	9'-9"
24	11'-6"	11'-6"	10'-9"	9'-4"	9'-4"	9'-4"	8'-1"	8'-1"	8'-1"

- Heights are based on AISI S100-16 (2020) w/S2-20, North American Specification, and AISI S220-20, North American Standard for Cold-Formed Steel Framing - Nonstructural Members, using steel properties alone.
- Above listed Non-Composite Limiting Heights are based on discreet stud bracing at 4 ft o.c.
- Heights are limited by moment, deflection, shear, and web crippling (assuming 1" end reaction bearing).