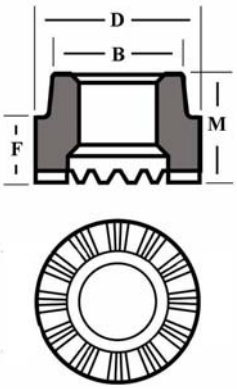
NELSON STUD WELDING

FERRULE SPECIFICATIONS: Special Ferrules for Welding Through Metal Deck

Stud shear connectors, pioneered be Nelson Stud Welding, have been recognized for many years as the most efficient means of achieving the necessary interaction between steel beams and concrete slabs in composite construction. Studs were soon followed by metal deck as another upgrading of the composite approach.



Nelson completed the cycle by developing the equipment and ceramic ferrules to reliably weld shear connector studs to beams, through metal deck, cellular decks, and single decks, with commercial grade (1-1/4 oz. per square foot) galvanized coatings.

Benefits of Basic Design Upgraded by Metal Deck

The recognized advantages of composite beam construction are augmented, in many cases, through the use of metal deck. The composite beam consists of three elements: the steel beam, a reinforced concrete slab, and shear connector studs welded to the beam. The studs transfer horizontal shear from slab to beam, causing the two elements to act as a single unit. The strength and stiffness of the effective section are increased without using more steel.

Composite design permits savings in steel tonnage of up to 20%. It reduces building height and saves on materials because lighter beams result in shallower floor sections, and provides larger rooms with fewer obstructions because longer spans may be used.

Although the advantages of metal deck may differ from job to job, the general benefits are so broad that deck can be recommended wholeheartedly. Here are some typical benefits:

- Metal deck provides a permanent form for concrete and eliminates the cost of wood forms and shoring costs.
- Less reinforcing steel is needed.
- Construction is faster because deck serves as a work platform for all trades.
- Electrical cables may be placed in cellular sections of deck.
- Suspended ceilings may cost less because it is simpler and faster to suspend them from metal deck than concrete.
- Metal deck stiffens the structure.
- A construction fire hazard is eliminated, usually resulting in more favorable insurance rates.

Stud Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
3/8	0.785	0.875	0.281	0.438	100101242
1/2	1.030	1.150	0.438	0.625	100101237
5/8	1.030	1.203	0.437	0.625	100101203
3/4	1.210	1.330	0.406	0.593	100101175*
3/4	1.210	1.304	0.406	0.593	100101177**
3/4	1.210	1.410	0.497	0.674	100101181***

* Standard ferrule
** Chamfered for narrow valley decking
*** Stud centering ribs in ferrule neck

The neck diameters of the ferrules are shown to assist in the selection of ferrule grips, ferrule holders, and foot plates.

For information on the studs that are used with this process, see Nelson H4L Concrete Anchor and S3L Shear Connector studs.

Note: Welding through metal deck is an application very dependent upon job site conditions and must be application qualified according to site conditions, metal deck thickness, amount of galvanizing on the deck, etc. Consult your Nelson Sales Representative for appropriate use of the ferrules shown and application details. Also consult guidelines and restrictions on through deck welding as shown in *AWS D1.1 Structural Welding Code – Steel and American*

Visit our website **www.NelsonStudWelding.com** for a list of our standard stock products.

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Institute of Steel Construction Allowable Strength Design and /or *Load &Resistance Factor Design* manuals of steel construction.

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