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Experimental Study of Flex-C Trac for Dome Applications

A typical cold-formed steel dome structure consists of a compression ring, tension ring and ribs. Under gravity loads the rib members must possess bending strength. To quantify the bending strength of Flex-C Trac profiles that may be utilized for dome construction a test program was performed. This report summarizes the test program which was conducted September 21, 2009 and the findings of this test program.

Test Specimens and Setup

The test program was performed in accordance with the *North American Specification for the Design of Cold-Formed Steel Structural Members*, AISI S100-07. To determine the pure bending capacity of the Flex-C Trac profiles that may be used as rib members in a dome the following products were tested:

Depth (in.)	Thickness (Ga)	Moment Capacity (in-lbs)
3 5/8	20	368
3 5/8	18	637
3 5/8	16	1151
6	20	645
6	18	1911
6	16	2107

The test specimens were randomly selected and represent typical manufactured product.

The test setup simulated a simple span beam with two equal concentrated loads located to create a constant bending condition in the mid-section of the beam (Figure 1). For each Flex-C Trac profile three tests were performed. The above moment capacity is the average tested moment capacity of three identical tests of each profile. A safety factor of 2.5 was used when computing the above moment capacities.



Figure 1 Typical Test Specimen