STEEL KING®

TEST #030494a

Effect of Heavy Horizontal Braces Upon Impact Resistance.
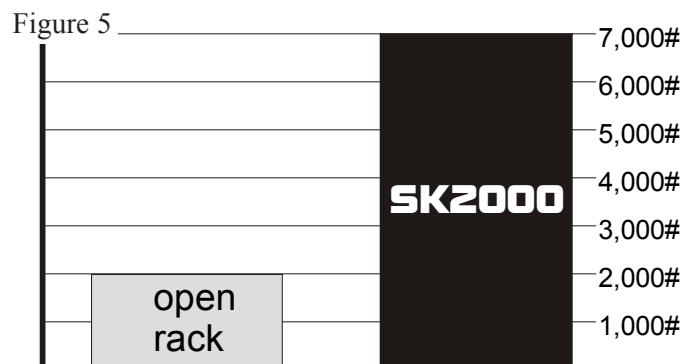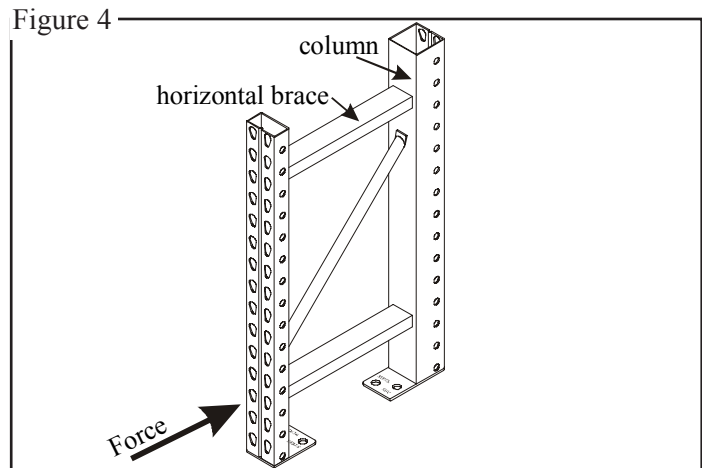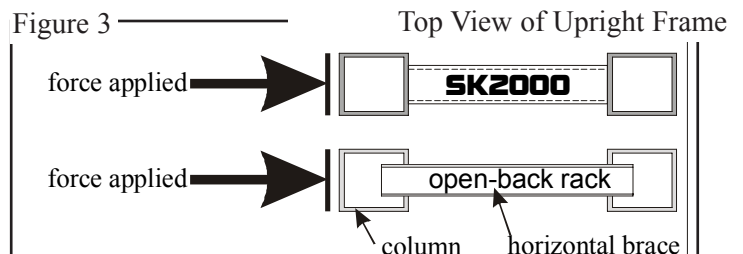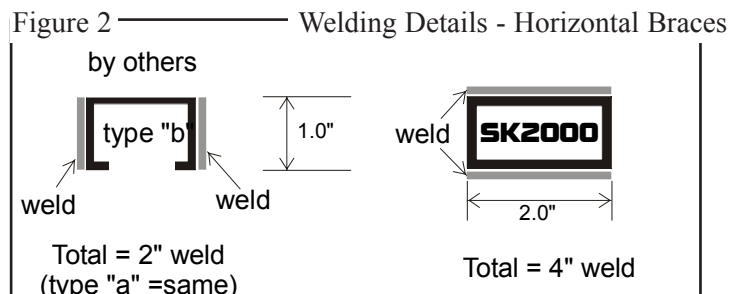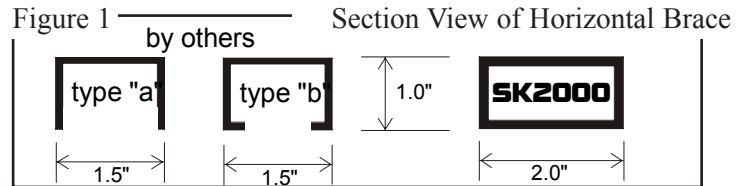
An independent engineering laboratory tested SK2000 racking for the purpose of quantifying several of the design advantages inherent in SK2000 pallet rack. The results of one such test is outlined below.

At no extra charge to the consumer, Steel King's SK2000 series pallet rack frames feature "heavy horizontal braces". These braces are constructed of closed structural steel tubing, 1" high x 2" wide, as compared to the industry standard formed sheet metal sections, usually 1" high x 1.5" wide, with or without return flanges **(Figure 1)**. The SK2000 brace is welded across both 2" surfaces, as compared to two 1" welds on most other racks **(Figure 2)**. When these design features are combined with the SK2000 tubular column, resistance to damage from accidental impacts is greater. This test was performed to quantify that difference.

The SK2000 frame type, and the industry standard open-back frame type, were tested as detailed in **Figure 3**. The "industry standard" frame type included braces with return flanges (type "b"). A continually increasing force was applied to one column, through the horizontal brace, and into the rear column. This is in the same direction as one would expect fork truck impacts to occur **(Figure 4)**.

The industry standard open section design failed at 2,000# of pressure. When subjected to a 2,000# load, the SK2000 design performed without any visually detectable damage, and continued to withstand increased pressure, until reaching it's own yield point at 7,000# **(Figure 5)**.

CONCLUSION: Users of SK2000 rack systems can expect decreased maintenance costs, and improved safety, by taking advantage of the **250% greater strength** proven by this test. (An even greater advantage would exist between SK2000 racks, and racks manufactured with bracing type "a"). This is only one feature of the SK2000 system that gives users more value for their investment.

Figure 1 — Section View of Horizontal Brace
by others
type "a"   type "b"   1.0"   **SK2000**
1.5"   1.5"   2.0"

Figure 2 — Welding Details - Horizontal Braces
by others
type "b"   1.0"   weld **SK2000**
weld   weld   2.0"
Total = 2" weld (type "a" =same)   Total = 4" weld

Figure 3 — Top View of Upright Frame
force applied → **SK2000**
force applied → open-back rack
column   horizontal brace

Figure 4
column
horizontal brace
Force

Figure 5
7,000#
6,000#
5,000#
4,000#
3,000#
2,000#
1,000#
SK2000
open rack

Force Applied, in pounds, to reach yield (failure) of frame assembly.