

SBHS (Steel for Bridge High Performance Structures) are high-performance, high-tensile strength steels developed to reduce the construction costs of steel bridges. SBHS have several important features:

- **Higher yield strength** than conventional steel and **uniformity of yield strength** regardless of sheet thickness. This allows for thinner plates to be used without a reduction in strength, reducing the overall weight and cost. In the example of the Tokyo Gate Bridge, SBHS 500 steel plates accounting for 50% of the total steel weight were used, reducing the cost of construction of the bridge by about 12%.

Nippon Steel Corp. Estimation Results of Savings on a 3-span continuous composite, 2 main girders (maximum span 60m)

Reduction of steel weight:

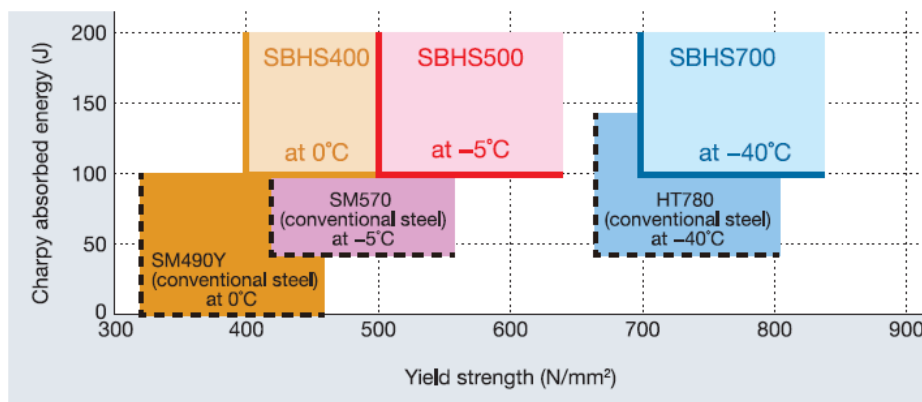
Using SBHS500 : **Approximately 7% reduction** (relative to SM570)

Using SBHS700 : **Approximately 15% reduction** (relative to SM570)

Reduction in total construction costs:

Maximum reduction of approximately 10% using SBHS500

Graph 1. Comparative Yield Strengths and Charpy Values of SBHS to Conventional Steels



- SBHS have **improved fracture toughness and plasticity**, which improves ease of welding and cold forming work. Improving fracture toughness of the welded joints can reduce the need for bolted joints.

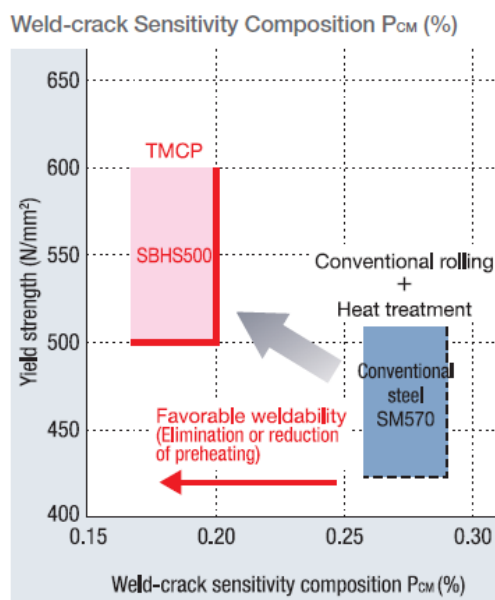


Smooth surface
 =
 Long Life for
 Painting

Bolt less Joint

- In SBHS high-performance steel plates, unlike conventional steels, high strength is compatible with **high weldability and workability**. Compositional changes in SBHS steels give a lower weld crack sensitivity factor which **eliminates or reduces preheating requirements**, (see Graph 2).

Graph 2.



- SBHS have a **higher capacity for heat input during welding**. This allows for reduced number of welding passes, eg, standard SM570 compared to SBHS 500 steel joint below.



There are many application advantages to using SBHS such as longer spans, efficient transport and erection, more efficient fabrication and welding, all of which can lead to significant cost savings on a bridge project.

SBHS is available in conventional weathering steel specifications, (identified by the added W in the designation), optimising all the benefits of using SBHS Steels plus lower cost of life maintenance and improved environmental impact of a weathering steel.

For coastal applications, SBHS is available in Ni-added advanced weathering steel specifications, or as CORSPACE. This is a high performance steel which requires a coating system like conventional steels but its corrosion resistance gives the advantage of an extended re-coating cycle, i.e. can be reduced from three or four re-coats required during service life to just one, significant life cycle cost savings and better environmental sustainability.