1. Introduction

Following the Great East Japan Earthquake on March 11, 2011, further improvement in the earthquake resistance of buildings has been demanded. Accompanying the recent trends toward high-rise and long-span construction in buildings, examples of application of large section, high strength welded H-shapes have also increased. In response, JFE Steel developed Japan's frst 520 N/mm² class TMCP H-shape "HBLTM-H355" for building construction (with maximum strength)

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Charpy Tensile test (Test piece: JIS No. 1A) Chemical composition (%) impact test Size (mm) YP or YS $P_{\rm CM}$ C Si Mn $C_{\rm eq}$ YR(%) EL(%) $_{\mathbf{V}}E_{0}\left(\mathbf{J}\right)$ (N/mm^2) (N/mm^2) *H*4

 $\leq 1.65 \leq 0.030 \leq 0.015 \leq 0.44 \leq 0.29 \quad 355-475 \quad 520-640 \leq 80 \qquad 19 \leq 0.09 \leq 0$

Thickness (mm)	Welding process	Welding material	Pre-heat temperature (°C)	Cracking (%)
40	GMAW (CO ₂)	YGW18	5 25	0

GMAW: Gas metal arc welding YGW18: JIS Z 3312

Thickness (mm)	Wolding	Bead length					
	process	Δrc	10 mm	20 mm	40 mm	50 mm	125 mm
40	SMAW	412	368	347	315	282	287
	GMAW (CO ₂)m	m					