
KX

Development of Steel Box Column RIVER BOX W by KX Welding Method

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:

KX

(1)KX

16 40mm

(2)

Synopsis :

Steel box column built-up from four steel segments by welding has many advantages over the counterparts made by other methods. Only disadvantage is its high production cost because of relatively large manhour. As a result of the studies on the welding method, it was proved that the application to the box column of "KX welding method", a multi-electrode submerged-arc welding method developed by this company, leads to cutting down welding manhour. This article reports on various experiments conducted in the course of development. Main results are as follows: (1) KX welding method, when applied to the seam welds of steel box column, makes possible a full-penetration by one-side and one-pass welding with 16 to 40mm thick plates.(2) KX welding method has advantage over the conventional welding methods in welding manhour, material consumption and weld deformation.

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KX 溶接法による角鋼管柱リバーボックス W の開発

Development of Steel Box Column RIVER BOX W by KX Welding Method

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Synopsis

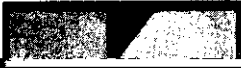
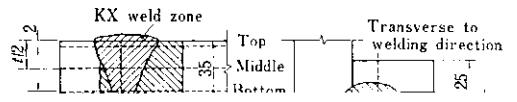
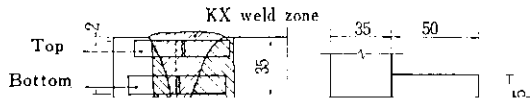


Table 2 Chemical compositions of KX weld metal

Element	Symbol	Unit	Value
Carbon	C	%	0.05
Manganese	Mn	%	0.02
Phosphorus	P	%	0.005
Sulfur	S	%	0.002
Iron	Fe	%	99.92
Nickel	Ni	%	0.005
Copper	Cu	%	0.002
Aluminum	Al	%	0.001
Silicon	Si	%	0.001
Chromium	Cr	%	0.001
Molybdenum	Mo	%	0.001
Niobium	Nb	%	0.001
Titanium	Ti	%	0.001
Zinc	Zn	%	0.001
Lead	Pb	%	0.001
Antimony	Sb	%	0.001
As	As	%	0.001
Sn	Sn	%	0.001
Bi	Bi	%	0.001
Se	Se	%	0.001
Te	Te	%	0.001
Ag	Ag	%	0.001
Au	Au	%	0.001
Hg	Hg	%	0.001
Co	Co	%	0.001
N	N	%	0.001
O	O	%	0.001
H	H	%	0.001



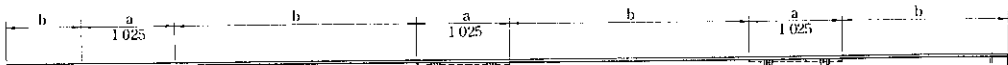


and manual or CO₂ gas shielded arc we

ldings

Table 7 Welding conditions for each weld pass

	Weld pass	Current (A)	Voltage (V)	Speed (cm/min)
A-specimen	1st	700	38	22
	2nd	"	"	"
	3rd	"	"	"



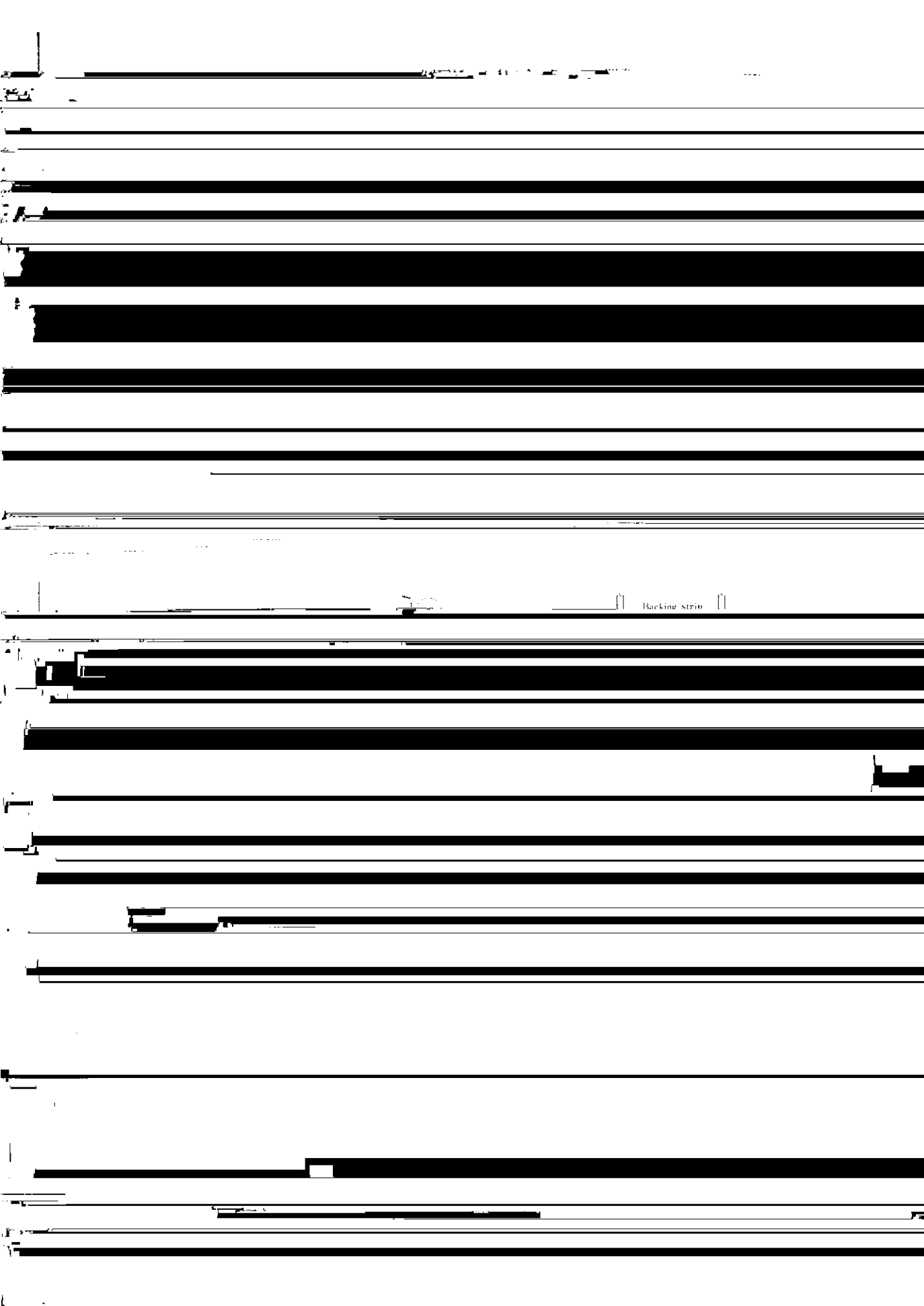
りを示す。Y方向の変形は、A試験体で平均7.67 mmであるのに対し、B試験体では2.70mmとなっている。すなわち、KX溶接法を用いると、Y

4.3.2 断面変形

Table 9 に入熱量と断面変形量を示す。同表に

を順次すましていく方法を、Dは対角に溶接して

ば、最も大きい場合でも 1.8mm となり、並列溶



Backing strip

図 11 40 角鋼管柱リバーボックス W の製作

Table 11. Welding test results of S45C

Thickness <i>t</i> (mm)	Gouging length (mm)	Operation on welding finish	Penetration depth (mm)		Defects in bead section		Bead width (mm)		Crater length	Judgment
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	0	E-0-0-100	3	0	△	△	31	27	310	×
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25	0	E-0-0-100	3	0	△	△	31	27	310	×
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	0	E-0-5-100	3	0	●△	●	32	27	260	×
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40	0	E-0-3-100	2	0	○	○	40	30	280	×
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	0	E-0-5-100	0	-5	○	●△	43	30	250	×
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(7) エンドタブは母材と同厚の鋼板にアーケア
ガウジングを施したものでよい。なお、クレー
クは溶接機操作により300mm程度を150mm

質に関する実験は、リバーSteel(株)に担当
していただいた。また、製造実験は川崎重工業
(株) 野田工場の協力をお願いした。機械的性