KAWASAKI STEEL TECHNICAL REPORT No. 17 October 1987

Mechanical Properties of 9% Ni Steel Plates Produced from Continuously Cast Slabs*

Synopsis:

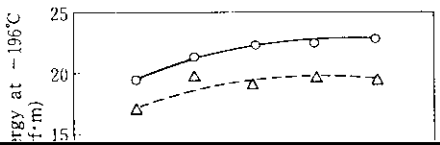
From a low P (0.006% max), low S (0.002% max) con

process (MACS-T) was investigated, and the applicability of the 9% Ni steel plates produced by the above-men-

Table 1 Chemical composition of steel tested (%)

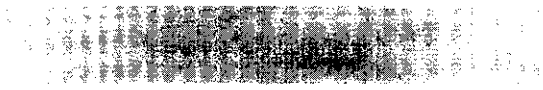
0.06	0.24	0.59	0.002	0.001	8.98	0.029	0.0037

This paper presents the results of such investigation and evaluation.



2 Optimum Manufacturing Conditions for MACS-T Process

(1) ductile fracture energy increases when the slab reheating and finish-rolling temperatures are raised, and that (2) the strength and toughness of base metal are good when the cooling rate after rolling ranges from 10



10 mm

Table 3 Mechanical properties of tested plates

Steel	Thickness (mm)	Direction	Tension test						Bend test	Charpy impact test*					
			Base metal			PWHT				Base metal		Strain aging		PWHT	
			YP	TS	El	YP	TS	El	$R=$	−170°C	−196°C	−170°C	−196°C	−170°C	−196°C

prestrain aging, the degree of this decrease was low; the critical COD value was 0.35 mm or more in all the

test was conducted using specimens taken at the center of the weld metal, the bond (WM/BM = 1), and the

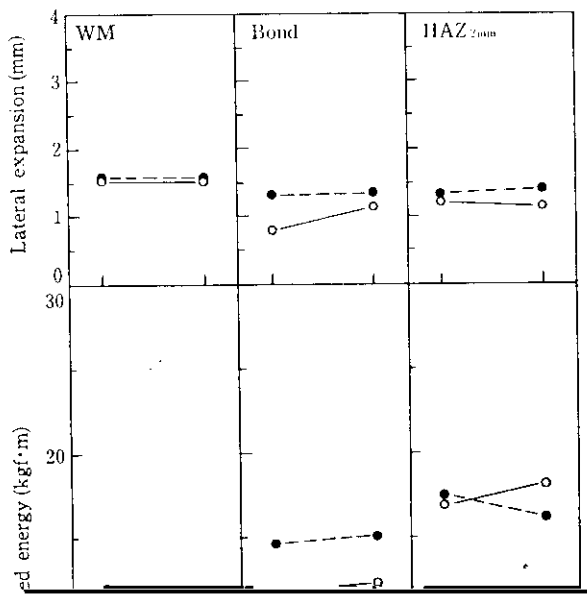
cases at −170°C and it was found that the steel in question met the requirements for LNG storage tank steel

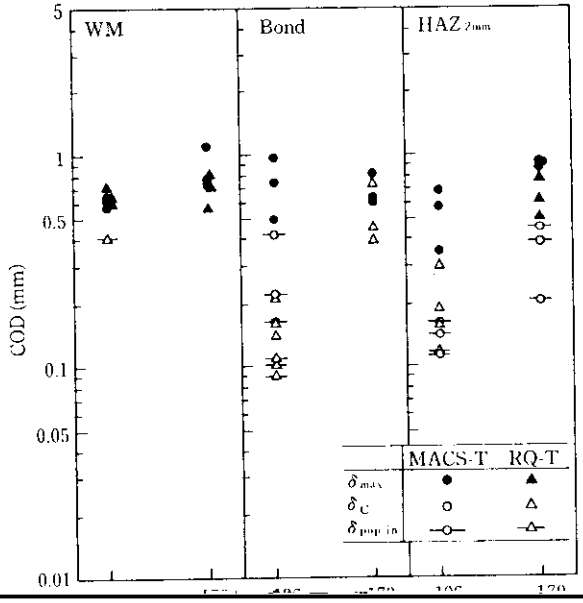
HAZ-2-mm (2 mm from the bond toward the base metal side). The test results are shown in **Figs. 6** and 7.

toughness.

Although the COD test results showed that the RQ-T

Table 5 Mechanical properties of welded joints


WM
Bond
HAZ 2mm
Lateral expansion (mm)
4
3
2
1
0
30
20
ed energy (kgf·m)


WM
Bond
HAZ 2mm
COD (mm)
5
1
0.5
0.1
0.05
0.01
MACS-T
RQ-T

test results

Table 7 Duplex ESSO test results (6) Critical COD of $\delta_c = 0.2$ mm (minimum

immediately after they reached the tested plates. The for RQ-T steel can be allowed at the design stress.