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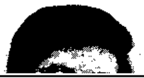
KAWASAKI STEEL TECHNICAL REPORT No. 17 October 1987

Al-killed Steel Plates for LPG Storage Tanks*



Synopsis:

conventional QT steel plates

(2) Ascertainment of the basic properties, fracture

Table 1 Characteristics of chemical composition

Table 2 Chemical composition of materials

(%)

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Steel	Three point bending COD test**	Deep notch test		ESSO test			Double tensile test		
	δ_C (mm)	σ_{net} (kgf/mm^2)	K_C (kgf/mm$^{3/2}$)	K_{Ca} (kgf/mm$^{3/2}$)	Classification*** A (°C)	Classification*** G (°C)	K_{Ca} (kgf/mm$^{3/2}$)	Classification*** A (°C)	Classification*** G (°C)
QT	>1.70 >1.73	58.6	634.2	190	−31	−64	210	−35	−67
KTR	>1.75 >1.79	53.8	550.5	600	−75	−105	700	−94	−138
MACS	1.51 1.41	56.7	580.2	660	−67	−88	700	−74	−103

* Tested at −50°C

** BS 5762

*** WES 3003

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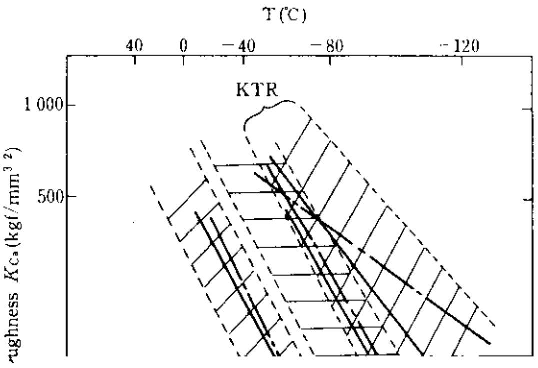

Table 5 The value of m and C obtained in fatigue crack propagation tests

Steel	Material constants	
	m	C
QT	3.20	5.71×10^{-11}
KTR	3.06	1.04×10^{-10}
MACS	3.36	3.35×10^{-11}

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Table 7. Mechanical [illegible] of [illegible]

Tensile test*	Bend test	Charpy V-notch test

fusion line of horizontal SAW joints of the QT steel. Results of these tests are shown in Table 8. As is apparent from this table, the temperatures for A-grade were $-66°C$ or below; the results were equivalent to or better

It is considered that the COD value δ and the strain e have the following relationship to the defect parameter $\bar{a}$:

$$\delta = 3.5 e \bar{a}$$

Table 9 The values of m and C obtained in fatigue crack propagation test

was more than 20 kgf·m at −60°C in the direction perpendicular to the rolling direction and the COD

value was more than 1.4 mm at −50°C in the direc-