

KAWASAKI STEEL GIHO

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2-1/4 3Cr-1

High Strength 2-1/4 and 3%Cr-1%Mo Steels with Excellent Hydrogen Attack Resistance

(Jun-ichi Shimomura)

## High Strength 2 $\frac{1}{4}$ and 3% Cr-1% Mo Steels with

## Excellent Hydrogen Attack Resistance

要旨

高強度鋼の製造技術とその応用 第 11 巻 第 4 号 昭和 40 年 12 月

Table 1 Chemical compositions of laboratory steels used

(mass %)

| Steel | C    | Si   | Mn   | P     | S     | Cr   | Mo   | V    | Nb    | Ti    | Al   | B      | REM*  |
|-------|------|------|------|-------|-------|------|------|------|-------|-------|------|--------|-------|
| A     | 0.13 | 0.05 | 0.52 | 0.004 | 0.001 | 2.37 | 1.09 | 0.25 | 0.021 | —     | 0.03 | —      | —     |
| B     | 0.13 | 0.06 | 0.52 | 0.004 | 0.001 | 2.37 | 1.09 | 0.31 | 0.021 | —     | 0.03 | —      | 0.004 |
| C     | 0.13 | 0.06 | 0.53 | 0.003 | 0.001 | 2.43 | 1.10 | 0.35 | 0.021 | —     | 0.03 | —      | 0.006 |
|       | 0.13 | 0.06 | 0.51 | 0.003 | 0.001 | 2.33 | 1.07 | 0.30 | 0.021 | 0.010 | 0.03 | 0.0010 | 0.004 |

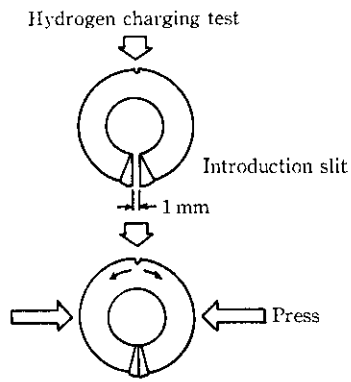
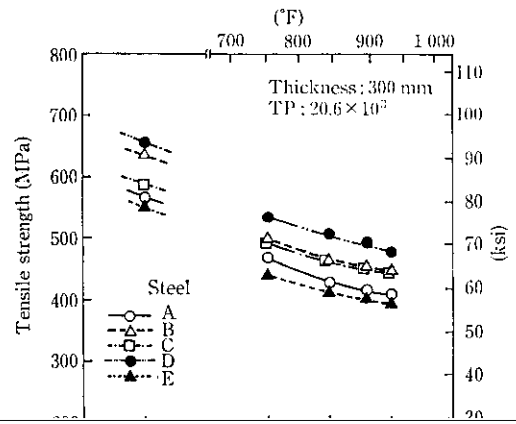
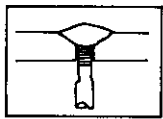


Fig. 1 Hydrogen attack test using cylinder type restraint crack.



ing specimen (IHI<sup>®</sup>)

R.T. 400 450 500 550  
Test temperature (°C)



Submerged-arc weld bead

Base plate and test specimens after welding

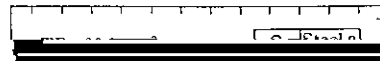
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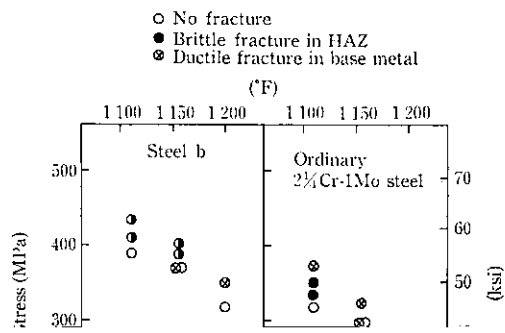
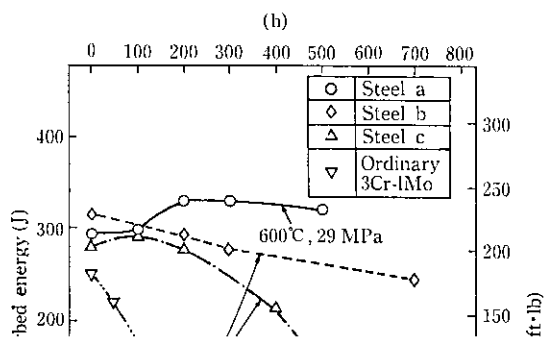
steel





Tempering parameter,  $T (R)[20 + \log t(h)] \times 10^{-3}$





- No fracture
- Brittle fracture in HAZ
- ⊗ Ductile fracture in base metal



