KAWASAKI STEEL GIHO
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Development of Extra-Deep Drawing Cold-Rolled Sheet Steels for Integrated Parts

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20ppm

850 880 0.5

Synopsis :

To develoc 0-62Tc 02-0.A855-0.008 47(f6 02-0.A855-0.00458ifFJ105 Tc 0.0064 (lp1M10.008[0)-5.6 (
properties of extra-low C steels have been investigated. Strong carbide-forming elements such as Ti and Nb are necessary to stabilize C even in 20-ppm C steels. Ti-bearing steel has superior ductility and drawability to Nb-bearing steel since grain growth at recrystallization is faster in Ti-added steel than in Nb-added steel due to the difference in the precipitate dispersion. A small amount of Nb addition to Ti-stabilized steel is effective in decreasing the planar anisotropy of mechanical properties. High temperature continuous annealing (850-880

複数難加工部品の一体プレス成形に適する超深絞り性

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要旨

一体成形用超深絞り性冷延鋼板の開発を目的として，極低炭素鋼

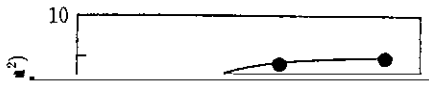
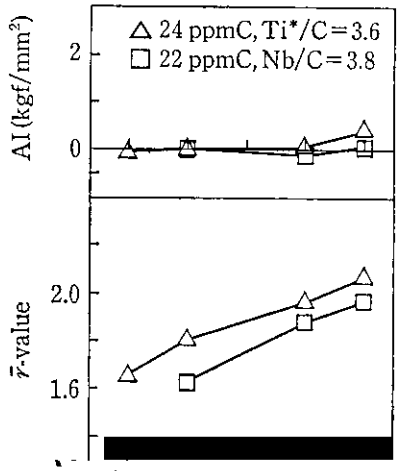


Table 1 Chemical compositions of steels used

Steel*	C	Ti	Ti*(at.%)	Nb	Nb (at.%)



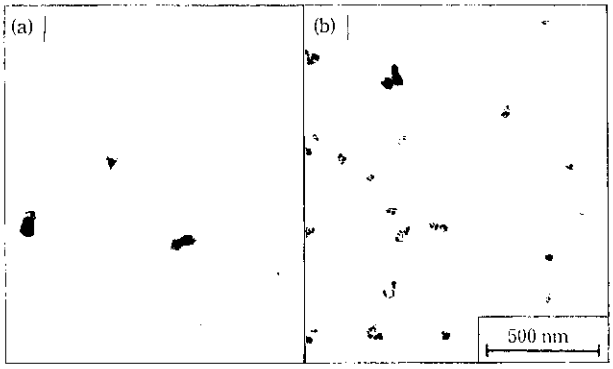
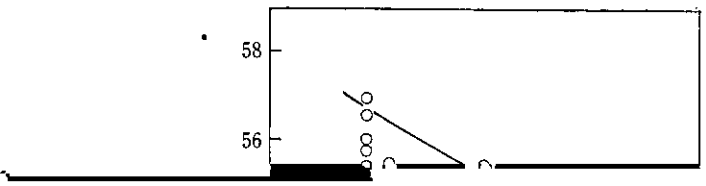


Photo 1 Transmission electron micrographs of (a) Ti- (steel T) and (b) Nb-bearing (steel N) hot bands


58
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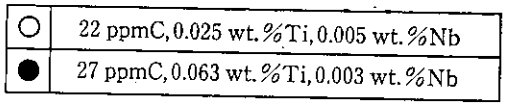
○ 22 ppmC, 0.025 wt.%Ti, 0.005 wt.%Nb
● 27 ppmC, 0.063 wt.%Ti, 0.003 wt.%Nb

Table 3 Manufacturing conditions and mechanical properties of newly developed EDDQ steels

Steel Type	Chemical Composition			Annealing temp. (°C)	Temper-R. reduction (%)	YS	TS	El	$\bar{r}$	Δr
	C	Ti	Nb							