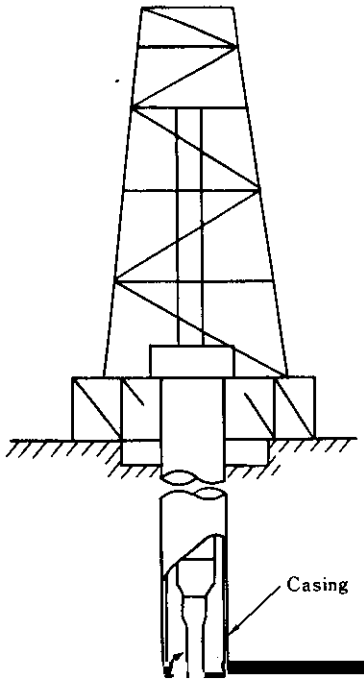
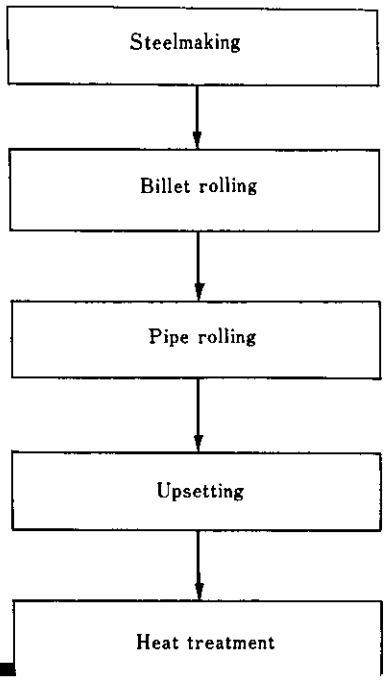
KAWASAKI STEEL TECHNICAL REPORT No. 10 December 1984

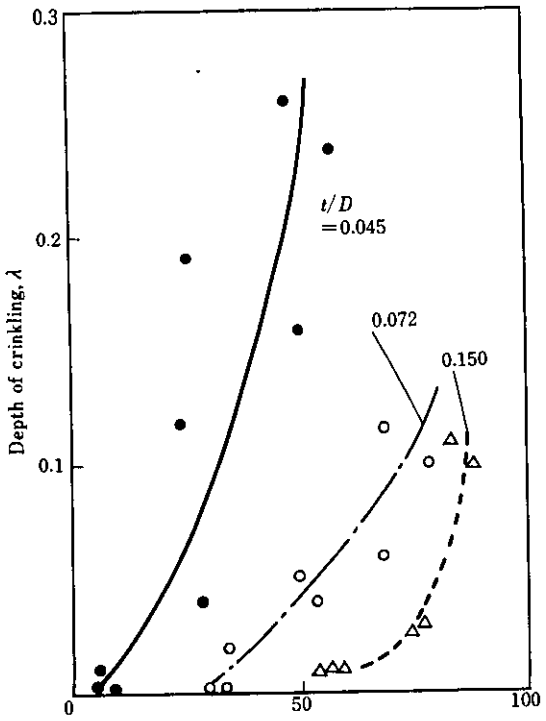
The Manufacture of Drill Pipe and Its Properties*

Manufacturing and properties of drill pipes of API 5A E, 5AX X95, 5AX G105, and

Outer dia. (in)	Grades						Total
	D	E	X95	G105	S135	Others	
2⅜	326	262	89	371	30	313	1 391
2⅞	635	2 889	238	1 893	605	868	7 128


Casing


Steelmaking
Billet rolling
Pipe rolling
Upsetting
Heat treatment



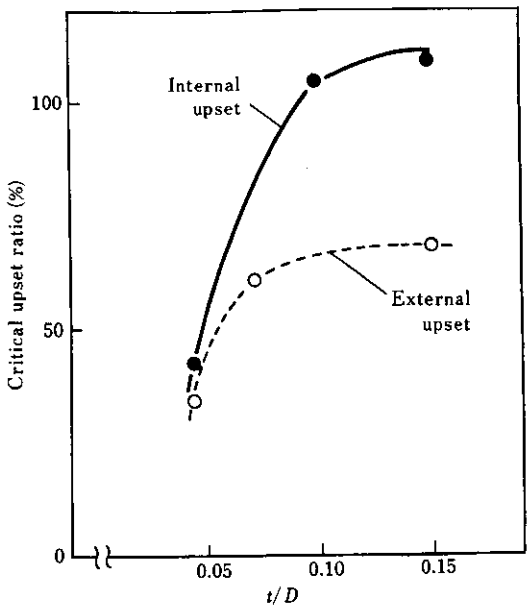


Fig. 4 Effect of t/D on critical upset ratio[2)]

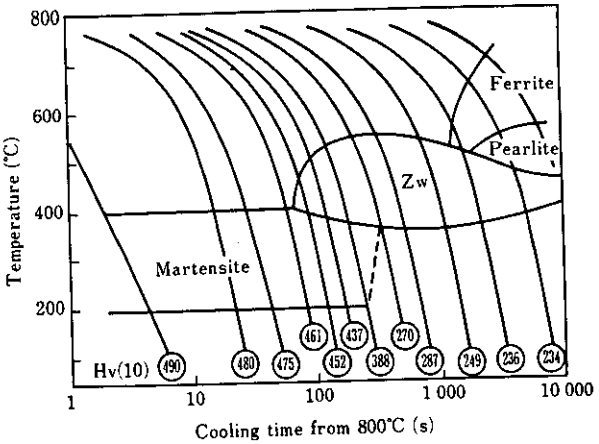


Fig. 5 CCT diagram of steel for S135 drill pipe

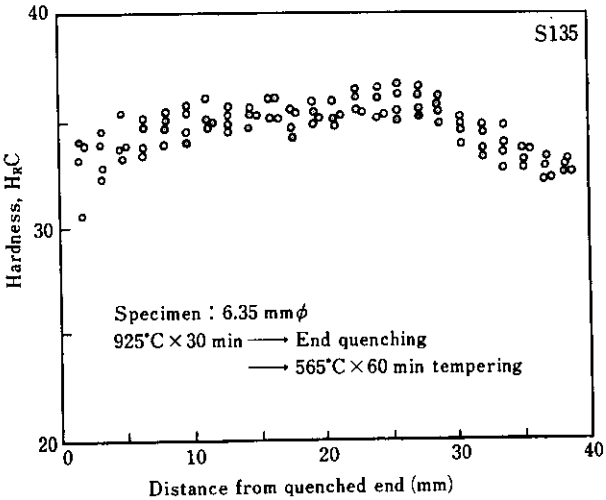


Fig. 6 Hardness distribution in Jominny specimen after end-quenching and tempering (S135 drill

recognized even at the upset portion.

3.1.3 Cleanliness

The cleanliness of drill pipe of various grades is shown in **Table 3**. As the content of non-metallic inclu-

3.2.3 Impact properties

The results of Charpy impact test at the middle of pipe body are shown in **Table 5**, and an example of tran-

Grade	Upset ($t/2$)	Pipe body ($t/2$)

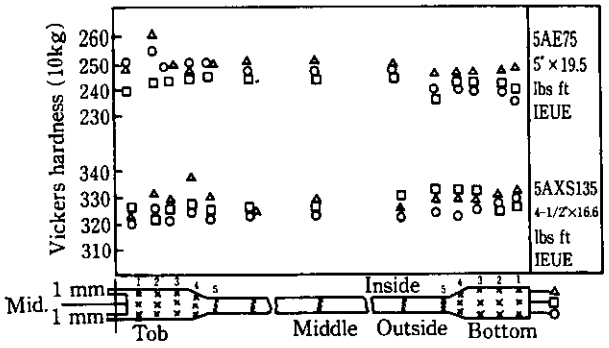


Fig. 7 Hardness distribution in E75 and S135 drill pipes

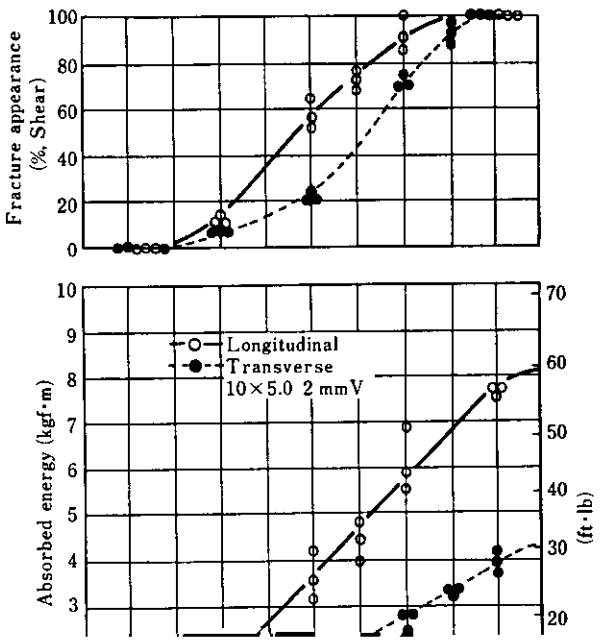
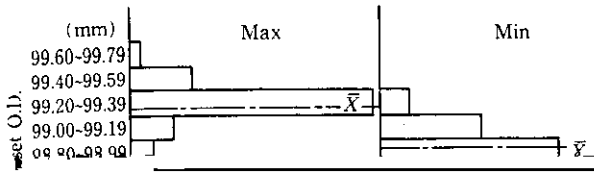


Table 5 V-notched impact test results

Grade	Direction	Specimen size	$vTrs$	vE_{-40}
		mm	°C	kgf·m
F	L	10×7.5	−128	16.0

Specimen	Stress range (kgf/mm²)	Number of cycles to failure	Upsetting condition
C1	65	1.21×10^5	Bad



duction process.

4 Production of Drill Pipe

Before starting the commercial production of drill