

Manufacturing Techniques and Characteristics of High Grade ERW Line Pipe API 5L X80*



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Synopsis:

Kawasaki Steel has been exploring technology for API 5L X80 by 26" ϕ ERW pipe mill at Chita Works. It is the most important to develop the high-strength, large-thickness hot rolled coil with excellent toughness and to improve the toughness of welded seam. By adoption of the new controlled-rolling method, edge miller machine and gas-shielded welding technology, Kawasaki Steel has made the development of API 5L X80 ERW line pipe 26" ϕ \times 0.574" t with excellent toughness, whose v_{TS} of the Charpy impact test is under -32°C . This paper describes the details of the pipe manufacturing process and the properties obtained.



Table 1 API 5L X80 requirement

No. 5 (R5) roughing mills is conducted in the unrecrystallized region of austenite. This is accomplished by

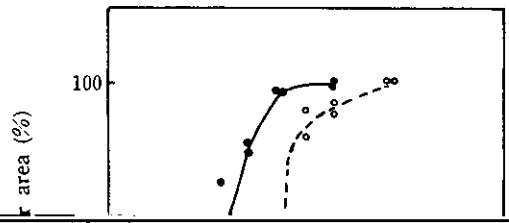
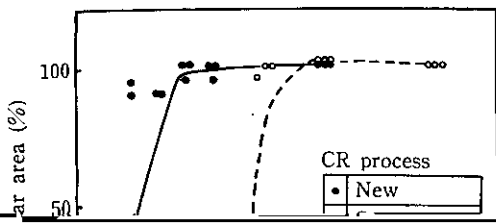
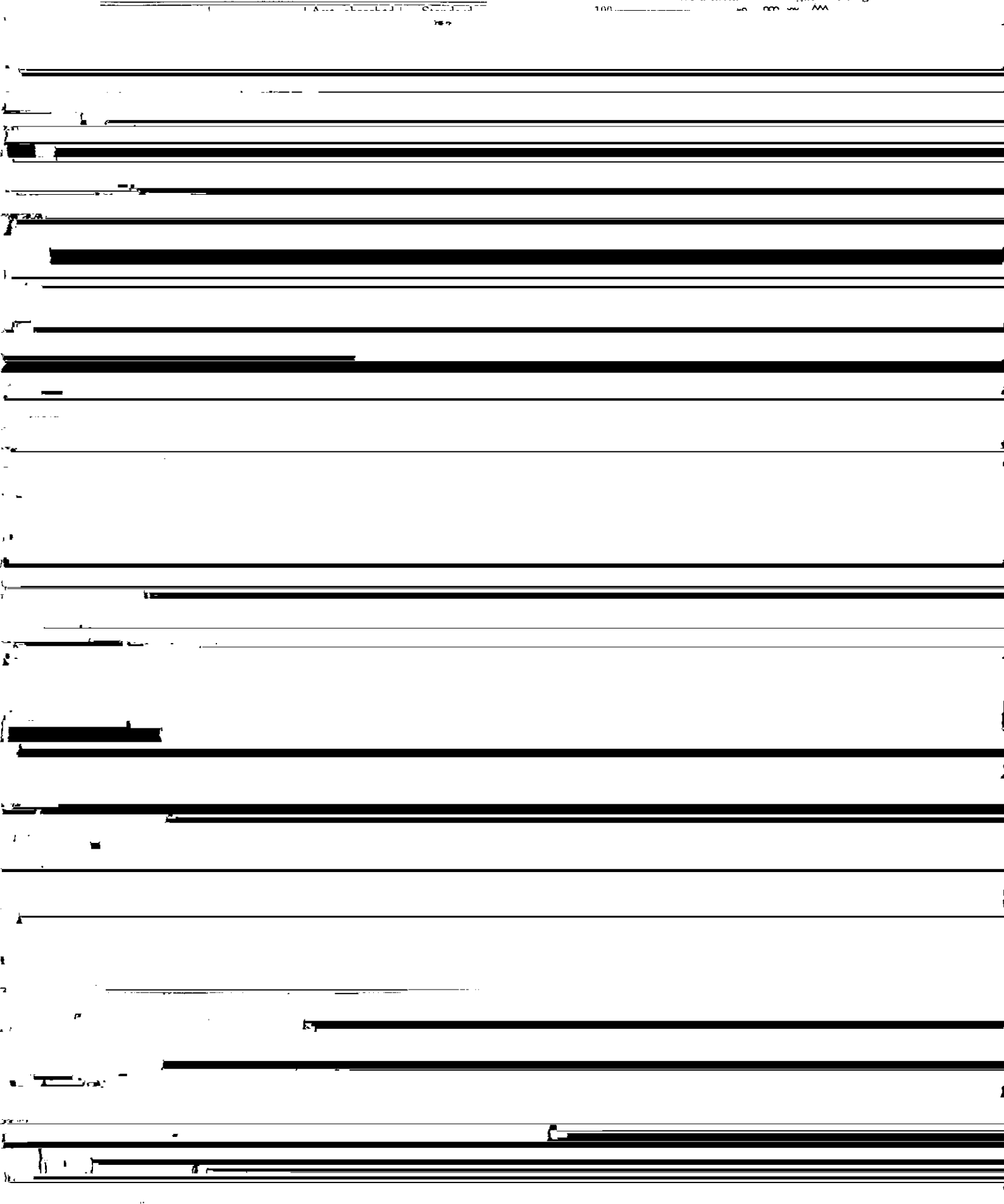


Table 4 Effect of edge trimming methods on Charpy absorbed energy of welded seams*1

○—○ Base metal
×-----× Weld metal with gas shielding
△-----△ Weld metal without gas shielding



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temperatures of -32°C or less. Incidentally, the shear area in the DWTT at 0°C is specified as 40% or better for API 5L SR6 (Supplementary Specifications). The 85% FATT was -20°C in this example of pipe making, as shown in Fig. 9.

of welded seams on the outer surface, at the midpoint, and on the inner surface is uniform, although the hardness of the welded seams is slightly lower than that of

Results of comparisons of the toughness levels with the new and conventional manufacturing methods are shown in Figs. 10 and 11. The toughness of X80 pipe produced by the new method shows substantial improvement.

