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Steel Pipe

Automation of Ultrasonic Plate Inspection

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Synopsis :
To reinforce the Works, heavy-plate quality assurance System, the existing auton atic ultrasonic test (AUT) system has been recently retrofitted into a fully automated one, followed by the development of a new AUT system for ultra-thick plates, in the Mizushima Works of Kawasaki Steel. All the operations of the AUT system for plates whose thickness range is up to 60mm, such as the setting of testing conditions, testing operation, evaluation, and recording of test results, can be automatically carried out by the digitized devices and a process control computer system. The ultra heavy plate AUT system, which can test plates of over 60mm in thickness, has been developed with emphasis on the automatic recording of test results and the collapsible and portable mechanism that has provided an easier handling of the system. These AUT system have successfully automated the ultrasonic inspection of plates in all thickness ranges, including ultra-thick plates, with very high reliability since their commissioning.

The body can be viewed from the next page.

Automation of Ultrasonic Plate Inspection*

Synopsis:

viewpoint of quality control, more ultrasonic inspection

The decision on whether all or a some of these working

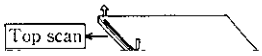
2.4 Inspection Capabilities

(1) Plate AUT System
To cope with high volume production, the overall cycle time required shortening. An AUT capacity of 10 000 pieces per month was provided.

Table 1 General specification of automatic ultrasonic tester (AUT) for steel plates

Item	Specification
Material	
Thickness	6.0~60.0 mm

formed. The results of the ultrasonic inspection are



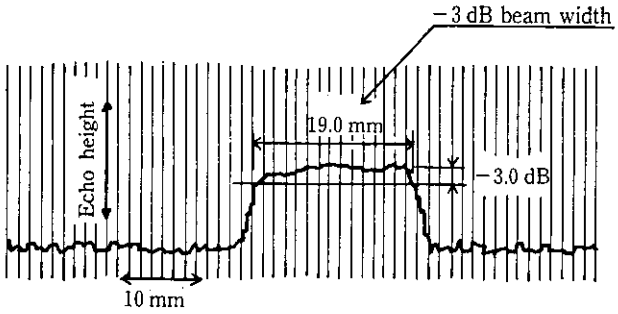


Fig. 7 Analogue chart of effective beam

3.3.3 Countermeasures against quasi-defects[4)]

One problem affecting the accuracy of AUT is quasi-defects due to noise. Conceivable causes of noise are noise generated by probe malfunction and surface irregularities of the plate such as shearing fins, grinder

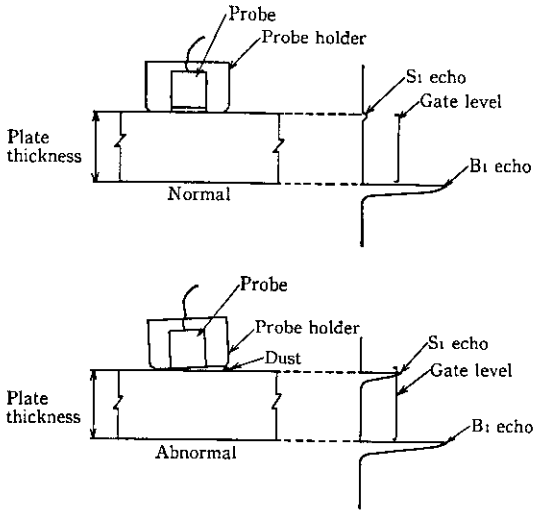


Fig. 8 Schematic figure of surface echo increasing mechanism

provided with the following measures against such plate-

Depth ness of the system. Side and inside views of the probe

Table 3 General specification of ultra-thick plate AUT

Item	Specification
Material	
Thickness	160~300 mm

scanning unit, controller, and water supply unit.

(2) The scanning unit can be disassembled into the scanning rail, probe, and scanner, which are then reassembled on the inspection piece at the operation site.

(3) Each bolck of the inspection unit is mainly of aluminum alloy; the weight of each block is under