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Development of On-line Wall Thickness Gauge for Small Size Seamless Tubes

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Synopsis :
Recently, seamless tube has been expanding its application fields. Accordingly customers want further improvement in accuracy of tube dimensions. In order to improve the wall thickness accuracy of small-sized seamless tube, an on-line wall thickness gauge has been developed right after the stretch reducing mill as a finishing rolling mill. This wall thickness gauge is a full-automatic measuring system requiring no size change. A measuring principle has been established for tube as three dimensional material using γ-rays. This development has also made clear an optimal signal processing method on the statistical noise of γ-rays. Now, the wall thickness gauge is in smooth operation and is useful to rolling control by operators.

The body can be viewed from the next page.

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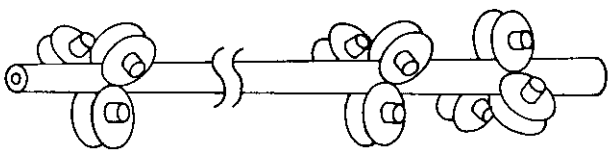
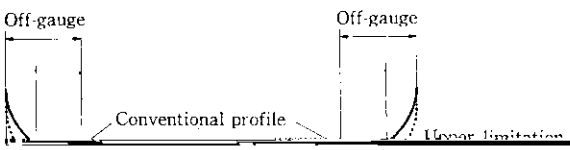


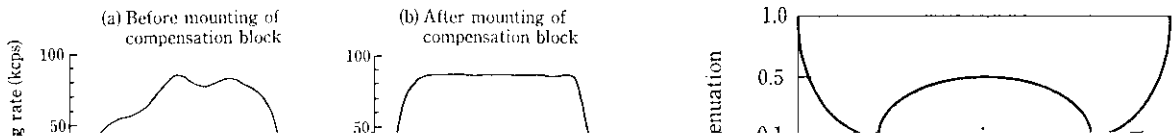
Fig. 1 Schematic illustration of rolling process of stretch reducing mill



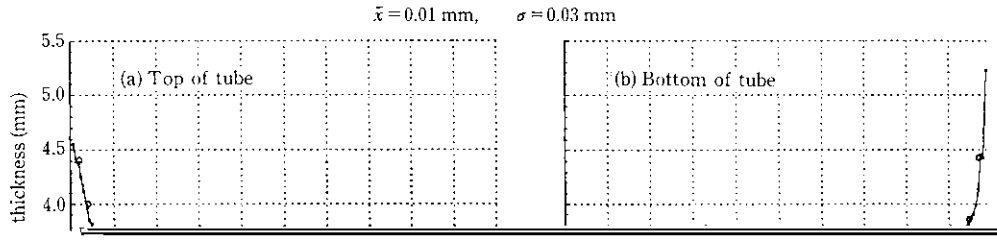
Items		Specifications
Diameter	(mm)	21.0～177.8
Wall thickness	(mm)	2.0～ 35.0
Length	(m)	6～ 67
Tube speed	(m/s)	2～ 8
Tube temperature	(°C)	600～950
Tact time	(s)	Min. 15
Response		0.01 s or 100 mm
Accuracy		±0.1 mm 100 mm ϕ × 10 mm t
Allowance of swing	(mm)	±10

Table 2 Comparison and selection on

this characteristic function is given by Eq.(2), it is


(a) Before mounting of compensation block
(b) After mounting of compensation block
g rate (kcps)
100
50
100
50
enuation
1.0
0.5

Tube size : 101.6 $\phi \times 3.45\ t$ (mm)



Length in longitudinal direction (m)