

ROLL INSPECTION

Advances in nondestructive testing have improved the methods used by both the roll manufacturer and the roll shop to evaluate the quality of the roll material. The objective of a proper roll maintenance program is to detect the earliest stage of a roll problem and to prevent that roll from being returned to mill service unless corrective action is made. The general inspection methods that can be employed by a roll shop are eddy current, surface wave ultrasonic, dye penetrant, etch, magnaflux and hardness testing. With all of the inspection techniques available, the quickest, most accurate and reliable are the eddy current and ultrasonic inspection. When used together, all surface conditions that could be detrimental to the roll or the rolled product during mill service can be detected with 100% accuracy (Table 1). Dye penetrant, and etch testing have the benefit of being an inexpensive method for inspection, however, they are time consuming and not always 100% reliable, therefore, they should be used in conjunction with eddy current and ultrasonic inspection.

TABLE 1

	<u>Inspection Method</u>			
	<u>Eddy Current</u>	<u>Surface (2)</u>	<u>Ultrasonic Pitch Catch Dual Probe</u>	<u>Straight Beam</u>
Effective Radial Depth (1)	0-.003"	0-.050"	0-6"	.5" -Bore
Bruise/Soft Spot	X			
Surface Micro Cracks (<.006")		X		
Surface Macro Cracks (>.006")	X	X		
Sub-Surface Indications			X	X
Residual Magnetism	X			
Work Hardening	X			

(1)Function of equipment parameters (Frequency crystal, type crystal, probe design)

(2) Circumferential Direction (3 scans required)
Longitudinal Direction (2 scans required)