

1.2.15. EDDY CURRENT INSPECTION OF STEEL CASTINGS WITH ROUGHLY FINISHED SURFACES

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For detection of flaw in railway rolling stock casting components radiographic (RT) and ultrasonic (UT) methods usually are used. These methods have some disadvantages. RT method is expensive, creates unhealthy radioactive emanation and is low productive for testing the different thickness components due long time for RT apparatus retuning. UT method is not efficient for testing surfaces with different curvature, low sensitive to surface flaws and need very good surface for good acoustical contact with transducer.

The goal of this paper is to turn the attention to possibility of eddy current (EC) method to detect surface breaking flaws in casting components with rough surface. Long time EC method was supposed to be not applicable for such product testing due high noise from the surface inhomogeneities. Another problem is low frequency signal trend during EC probe scanning due the magnetic property changes.

To work out the presented problem selective multidifferential EC probes in combination with additional differential summation signal response processing by application to 10 samplings it was proposed to use. The main advantage of such simple algorithm is the possibility to be applied with ordinary EC device. For example EC method was effectively used for testing of rolling stock lateral frames and above-spring frames made from 20GL steel by casting to ground. The surface roughness corresponds to Rz 320. This steel has small-grained ferrite-perlite structure after normalization. The comparative investigations of different size EC probes on operational frequency 17 kHz were conducted. The best results were obtained with the application of the Leotest MDF 1201 multidifferential EC probes and VD 3-71 EC device. Obtained results present good perspectives to solve problems of rough surface component nondestructive testing by the EC method application.