

4.1.4. MATERIAL, STRUCTURE AND HARDNESS TESTING OF CAST-IRON SAFETY PARTS BY NDT METHODS

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In the past, the producers of safety cast-iron parts were executing only random check to control their production line as relatively high rate of defective parts were acceptable.

Nowadays, due to the market demand because of producing high speed vehicles, continuous decreasing of the weight of parts and consequently using lower safety design factor and finally due to the high competition in the world market, very high quality parts are demanded and very low rate of defective parts even lower than the range of PPM is acceptable.

Therefore, random check is no more sufficient at all and 100 % of products should be tested. In testing safety parts 2 categories of tests must be executed:

1 – Flaw detection to find defects like: porosity, shrinkage, cracks and inclusion.

2 – Checking material mix, structure, heat treatment, microscopic texture, graphite type and other properties like tensile strength, hardness, and case depth.

In this study we concentrate on the second category of tests.

All of these tests can be done only by fast, reliable, and re-producible NDT methods. Different NDT methods like Eddy Current Testing (ET), Ultrasonic Testing (UT), Vibration Analysis (VA) or Thermography can be used for this purpose.

In this paper more common methods i.e ET and UT are described. The practical tests on production line of a passenger car to check Nodularity and Hardness of 3 types of cast-iron safety parts by both methods have been reported. By comparison of the results of both methods on the same parts, the conclusion and comments to select the proper test method has been presented.