

1.4.34. CONTRAST GRADIENT DETERMINATION IN DIGITAL RADIOGRAPHY TO OPTIMIZE THE CAPABILITY IN DEFECT DETECTION

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Digital radiography is a growing technique in x-ray examinations. The field of application is highly promising. The present work has the scope to study the main parameters that affect the quality of image in terms of contrast and definitions to establish the range in which the contrast reach the highest value.

A number of tests has been carried out on stepped wedge calibrated exposed at different level of energy and related time. The range of thickness involved has been between 5 mm and 20 mm. The steps change value has been between 0.2 mm and 1 mm.

Two fundamental diagrams have been traced after the experimental tests; grey level/ relative exposure relation and contrast gradient/ grey level relation.

The study of the research has been particularly focused on small thickness where digital radiography can give the best benefits compared to film radiography.

Another important consideration has been raised during the test; few cents of millimetres in wire diameter can cause a level of sensitivity more than 2% and consequently not accepted by the code.

This change in our opinion has not an effective impacts on the POD of type of defects like, lack of penetration, porosity, cracks, slag inclusion.

We propose in this case a tolerance of wire sensitivity up to 2.5 – 3%.