

## Reference procedure

Densitometric classification of X-ray film systems for non-destructive testing (NDT)

## Proof of competence

ISO/IEC 17025 accreditation

## Testing quantities and objects

From the exposed film response curve (optical density  $D$  versus X-ray dose  $K$ ) the parameters gradient at density 2 or 4 above fog, sensitivity (ISO speed) and granularity at density 2 above fog will be measured, the gradient-to-granularity ratio determines the achieved film system class.

## Testing range

Film response curve in the optical density range  $0 < D < 5$ , Granularity measurements using a micro photo densitometer (0.1 mm optical aperture, density range up to  $D < 3$ ) down to minimal 0.001 achievable, film size for exposure typically  $10 \times 24 \text{ cm}^2$

## Expanded measurement uncertainty ( $k = 2$ )

Diffuse density (range  $0 < D < 5$ ): absolute  $< 0.02$

Gradient (at  $D - D_0 = 2$  or  $4$ ):  $< 2 \%$  or  $< 4 \%$ ,

Granularity (at  $3 \times 1100$  measurement points):  $< 5 \%$

## Field of application

Industrial radiographic testing using X-ray films as image detector and archive, classification of image quality of X-ray film systems into film system classes C1 to C6 acc. to ISO 11699-1, basis for BAM certification scheme BZS-ZP / 2.5.1 "Film Systems for Industrial Radiography".

## References

DIN EN ISO 11699-1:2012-01, Non-destructive testing - Industrial radiographic films - Part 1: Classification of film systems for industrial radiography (ISO 11699-1:2008); German version EN ISO 11699-1:2011, <https://dx.doi.org/10.31030/1826570>.  
ASTM E1815-18, Standard Test Method for Classification of Film Systems for Industrial Radiography, <https://www.doi.org/10.1520/E1815-18>.

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