

ESPI

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A study on the measurement of Internal Defects of Flange Weld Zone by using ESPI Methods.

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Key words : (Internal Defects), ESPI, Flange, Weld Zone

1.

RT(Radiographic Testing) 가 RT 가 가 RT 가 가 ESPI(Electronic Speckle Pattern Interferometry) . ESPI 가 ESPI 가 Out of plane ESPI, Shearography plane ESPI가 In plane of ESPI (ESPI .2005) Out of plane ESPI DATA

$$I_1 = I_O^2 + I_R^2 + I_O I_R \cos[\theta - \phi_R] \quad (2)$$

가 (Object beam) I_1 I_2

$$= 2N \quad (3)$$

$$= (2N+1) \quad (4)$$

Fig 1 N

가

$$= \frac{2}{\lambda} \{ d_1(1 + \cos \theta) + d_2 \sin \theta \} \quad (5)$$

Out of plane $d_1(1 + \cos \theta)$, $d_2 \sin \theta$, λ (wave length)

$$d_1 = \frac{n}{(1 + \cos \theta)} \quad (6)$$

2.

2.1 Out of plane ESPI

ESPI (Out of plane displacement) 가 (wave front) (fringe image) 가 (Intensity) $I_1 = I_O^2 + I_R^2 + I_O I_R \cos[\theta - \phi_R]$ (1) I_O, I_R (Object beam) (Reference beam) (amplitude) , θ, ϕ_R (phase) 가 (Intensity) 337

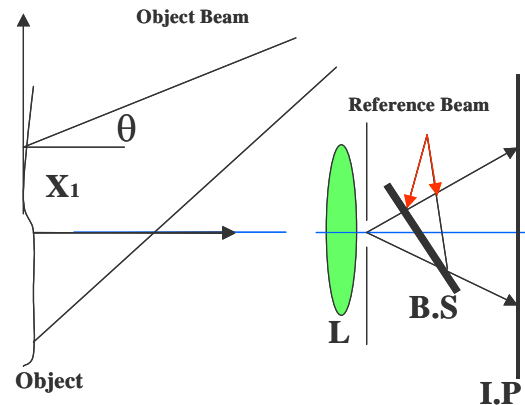


Fig 1 An optical arrangement giving fringe representing out of plane displacement

3.

ASME code section

가

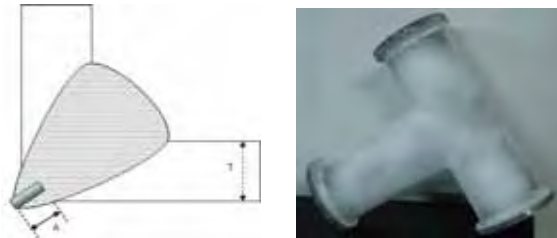


Fig 2 The shape of defect

Specimen	Length of defect(mm)
1	5
2	10
3	15
4	20
5	15(용입 부족)

Table 1 Specification of defects

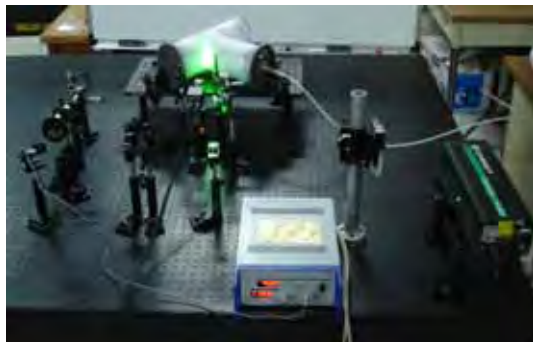


Fig 3 Out of plane ESPI setting

가 4 2, 4, 6, 8, 10 kgf/cm² 가

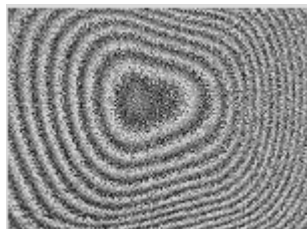


Fig 4 Not a defect



Fig 4 Results of 5mm (2,4,6,8,10 kgf/cm²)

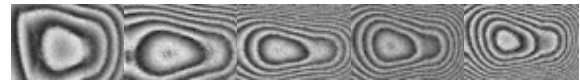


Fig 6 Results of 10mm (2,4,6,8,10 kgf/cm²)

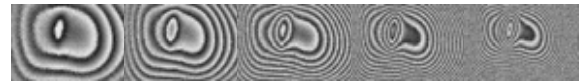


Fig 7 Results of 15mm (2,4,6,8,10 kgf/cm²)



Fig 8 Results of 20mm (2,4,6,8,10 kgf/cm²)

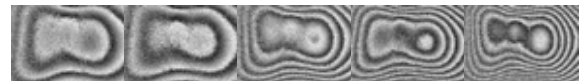


Fig 9 Results of Specimen5 (2,4,6,8,10 kgf/cm²)

Fig 4 , Fig 5 Fig 9 . Fig 5 Fig 8 Fig 4 가 Fig 4 , Fig 9 Fig 5-8

4.

ESPI Out of plane ESPI

Out of plane ESPI Out of plane ESPI

ESPI 가

(GJ-05-1-015)

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