

CAE 를 이용한 Bolt 체결 외팔보의 동특성 해석

Analysis of Dynamic Characteristics of Bolted cantilever using CAE Simulation

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1.

가 , 가
 Bolt가
 Bolt
 Bolt
 3가
 CAE

p_{max} :

r_o :

r_i :

F_b : Bolt

Normal Force

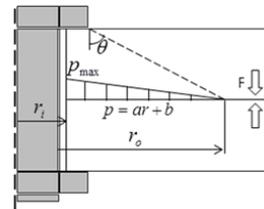


Fig 1. Relation clamping force with contact pressure

Bolt

Ostrovskii

(2), (3)

$$k_n = \frac{dF_b}{d\delta} = \frac{A}{mc} p_n^{1-m} \quad (2)$$

$$k_t = \frac{cm}{R} p_n^{m+s-1} \times k_n \quad (3)$$

2.2

30mm, 3.5mm,
 400mm . Bolt, Nut
 200, 300mm 12mm Hole
 .[Fig2]

(1)



Fig 2. Configuration of cantilever

2.1

(1)

$$p_{max} = \frac{3F_b}{\pi(r_o^2 + r_o r_i - 2r_i^2)}$$

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* ** FFT 가 (B&K Pulse3560-B040), 가 (Rion PV-90B),

Impact Hammer

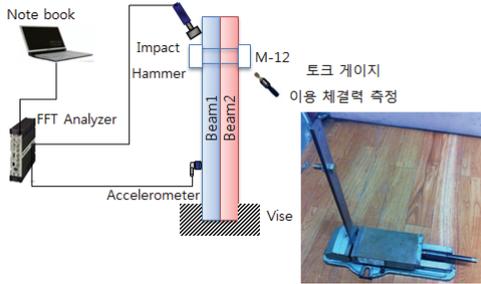


Fig 3. Equipment of experiment

2.3

Bolt

3/4L, 1/2L Bolt Force 0, 1, 2, 3, 5, 10, 15, 20kN,
Surface Roughness Fine/Rough

Table 1. Bolt joint condition

	Condition			
Bolt position	3/4L		1/2L	
Bolt Force	0, 1, 2, 3, 5, 10, 15, 20kN			
Surface Roughness	Fine	Rough	Fine	Rough

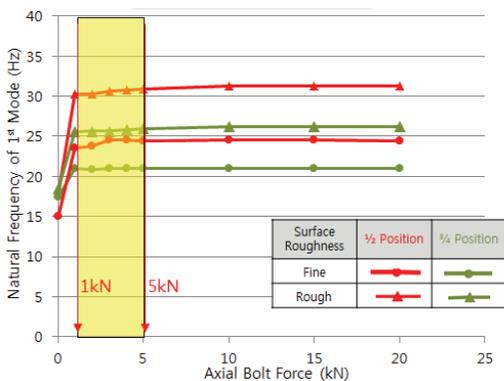


Fig 3. Result of experiment

Bolt 1/2 가
3/4 가 가 가 가
5kN 가

3. CAE

3.1 Simulation model

Simulation
Steel

3.2 Simulation

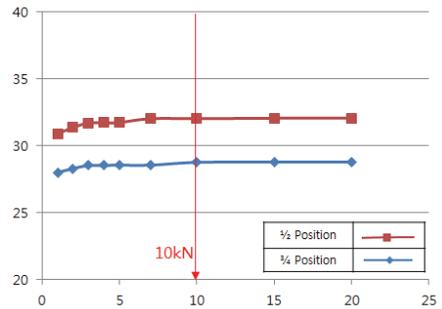


Fig 4. Result of Simulation

Simulation Bolt 1/2
가 3/4 가
가 가 가 10kN 가

4.

Bolted

CAE

가

- (1) Yoon Ji-Hyun, Sim Hyun-Jin, Fawazi Noor, Lee You-Yub, Oh Jae-Eung, 2007, Experimental Analysis on Conditions of Joint for Cantilever Beam, Journal of Sound and Vibration, Proceedings of the KSNVE Annual Autumn Conference pp. 1302~1306