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(// : // :)

ANSYS

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(Kulkarni et al., 1983)

(Baley, 2002)

(Elenga et al., 2009)

(Asasutjarit et al., 2009;

Khanbashi & Al-Kaabi, 2005; Liu et al., 2009)

(d'Almeida et al., 2006)

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(Kaddami et al., 2006)

(Beg et al., 2008)

(Alwar et al., 2009; Zare et al., 2009)

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(PVA)

(Alix et al., 2009; Ghali et

.(Zare, 2010)

.al.,2009)

. (Jacob et al., 2004)

()
()



.(Zare, 2010)

:

$$v = -\frac{\varepsilon_r}{\varepsilon_l} \quad ()$$

(GM1) ε_r ε_t

(GM2) $\varepsilon_t = \frac{L' - L}{L}$ ()

$\varepsilon_r = \frac{D' - D}{D}$ ()

L L () ()

D D

()

(Ressing et al., 2007)

(RMSE)

$\int_v \delta \varepsilon^T D \varepsilon dv = \int_v \delta u^T f_b dv + \int_s \delta u^T f_s ds$ ()

()

$\delta \varepsilon$ δu

D E

() -

()

$\sum K_{st}^e U = \sum F^e$ () (discrete) ()

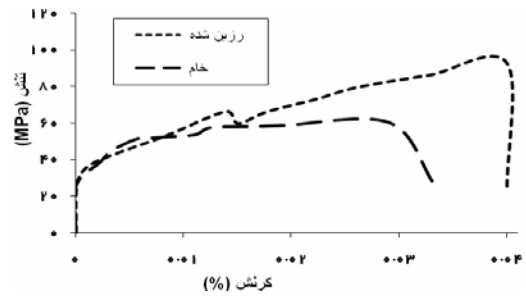
F^e K_{st}^e

()

U

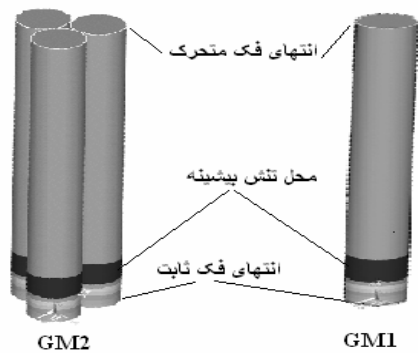
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(mm)	(N)	(MPa)	(%)	(MPa)
/	/	/	/	/
/	/	/	/	/
/	/	/	/	/
/	/	/	/	/
/	/	/	/	/
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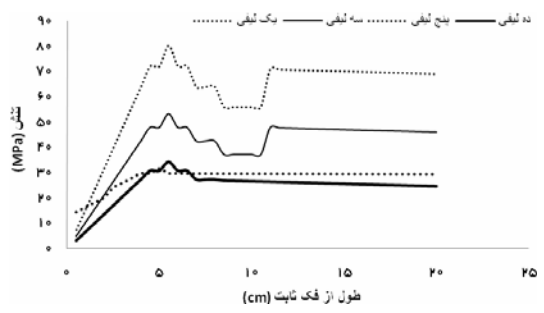
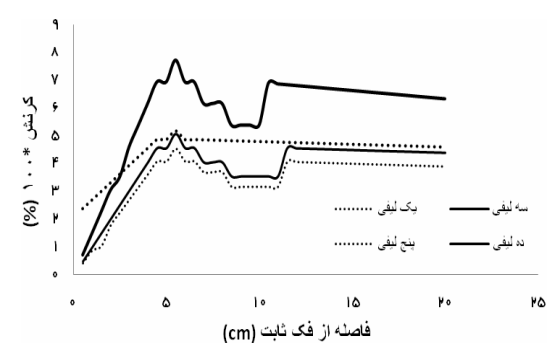
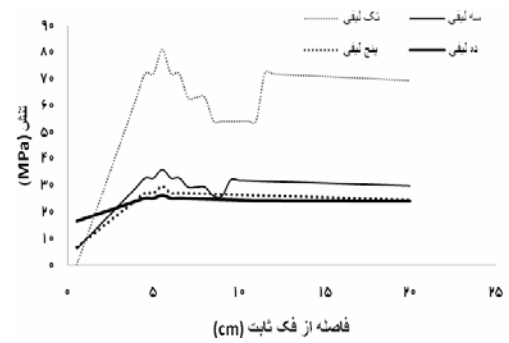
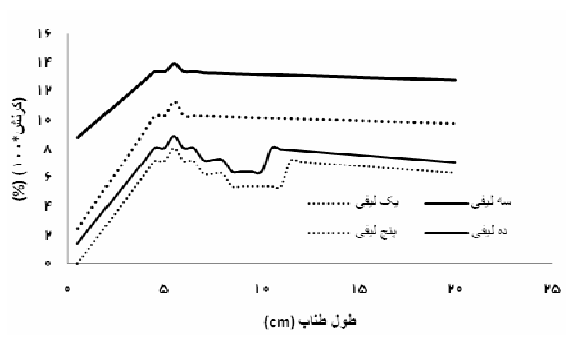
() ()

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(G'Sell et al., 1992)



() ()

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(RMSE)

(MPa)			(%)		
GM2	GM1		GM2	GM1	
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/		/	/	RMSE
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/		/	/	RMSE

$$\frac{1}{r}$$

(GM2)

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