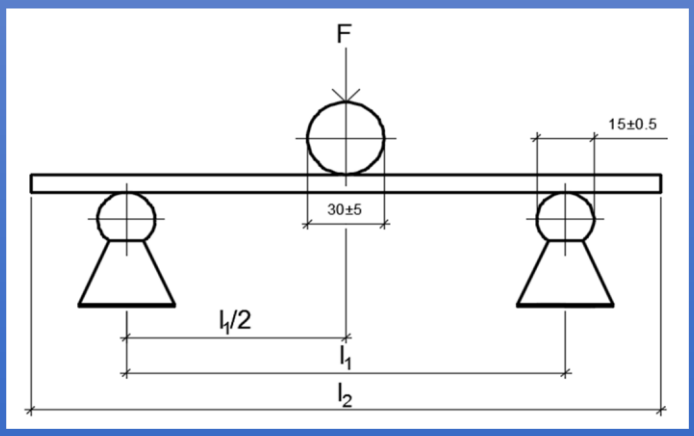
Tehnologija izrade CTL ploče	Zadatak	6
	List	1

Razlika između EN standarda 310 i 789.

STANDARDI:

EN 310 STANDARD – ispitivanje nestrukturnih ploča



1-epruveta zaispitivanje
F-sila pritiska $l_2$min=150mm
t-debljina epruvete
B=50mm
$l_2$max=1050mm
l_1=20t (mm)
l_2= l_1+50 (mm)

FORMILE I ZNAČENJE ČLANOVA:

$$f_s = \frac{3Fmax * l_1}{2 * b * t^2}(MPa)$$

F_{max} – max sila,

l_1 – dužina epruvete,

b – širina epruvete,

t – debljina epruvete,

$$E_m = \frac{M^3 * (F_2 - F_1)}{4 * b * t^3 * (a_1 - a_2)}(Mpa)$$

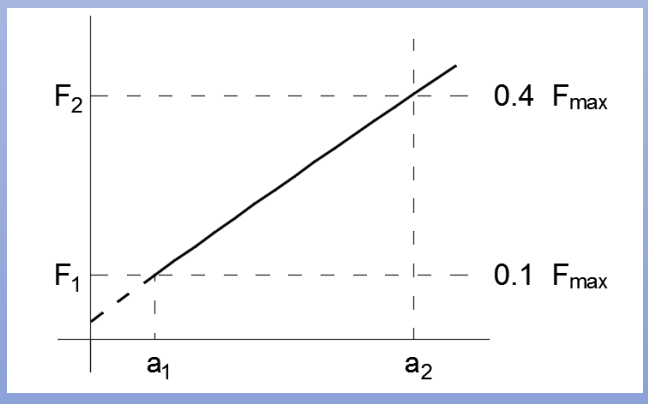
M –

$F_{1,2}$ – sila

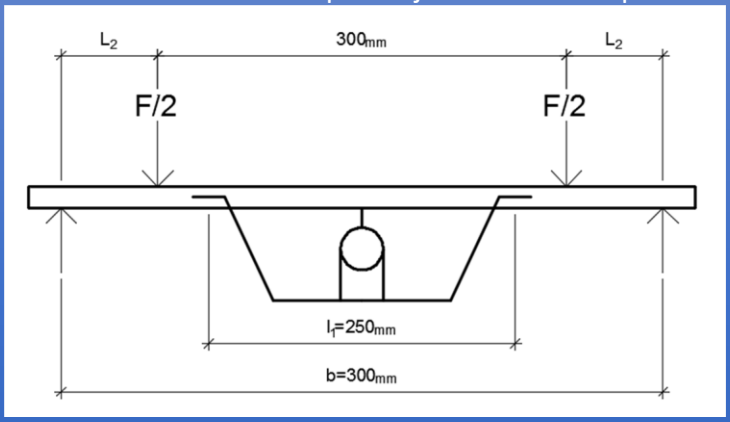
b – širina epruvete,

t – debljina epruvete,

$a_{1,2}$ -



EN 789 STANDARD – ispitivanje strukturalnih ploča



L_2=16t
min 240, max 400
L_1=250
b=300mm

FORMILE I ZNAČENJE ČLANOVA:

$$f_s = \frac{Fmax * l_2}{2 * \frac{b * t^2}{6}} \ (Mpa)$$

F_{max}– max sila,

l_2 – dužina epruvete,

b – širina epruvete,

t – debljina epruvete.

$$E_m = \frac{M^3 \ * \ (F_2 - F_1)}{4 \ * b * \ t^3 * (a_1 - a_2)} (Mpa)$$

M –

$F_{1,2}$ – sila

b – širina epruvete,

t – debljina epruvete,

$a_{1,2}$ -

TEXT ZADATKA:

1) Izračunati dimenzije uzoraka za ispitivanje savojne čvrstoće po EN 310 i EN 789 standarda, ako se ispituju ploče sledećih debljina: 4mm, 20mm i 60mm
2) Za izabrane vrednosti debljine ploče, sile loma i ugiba uzoraka, izračunati savojnu čvrstoću I modul elastičnosti prisavijanju. Proračunu raditi iza EN 310 i EN 789, a kod EN 789 uzeti da je sila loma (Fmax) 10 puta veća od zadate u tabeli.

PODACI:

Redni br.	d (mm)	Fmax	F_2	F_1	a_1	a_2
4	21	860	40%	10%	24	16

PRORAČUN:

RAD: STANDARD EN 310

1) t = 4mm

$$l_1 = 20 \cdot t$$
$$l_1 = 20 \cdot 4$$
$$l_1 = 80mm$$

$$l_2 = l_1 + 50$$
$$l_2 = 80 + 50$$
$$l_2 = 130mm => 150mm$$

2) t = 20mm

$$l_1 = 20 \cdot t$$
$$l_1 = 20 \cdot 20$$
$$l_1 = 400mm$$

$$l_2 = l_1 + 50$$
$$l_2 = 400 + 50$$
$$l_2 = 450mm$$

3) t = 60mm

$$l_1 = 20 \cdot t$$
$$l_1 = 20 \cdot 60$$
$$l_1 = 1200mm$$

$$l_2 = l_1 + 50$$
$$l_2 = 1200 + 50$$
$$l_2 = 1250mm => 150mm$$

RAD: STANDARD EN 789

1) t = 4mm , $l_1 = 250\ mm$

$$l_2 = 16 \cdot t$$
$$l_2 = 16 \cdot 4$$
$$l_2 = 64\ mm => 240\ mm$$

$$l_{uk} = 2 \cdot l_2 + 300 + 50$$
$$l_{uk} = 2 \cdot 240 + 300 + 50$$
$$l_{uk} = 830\ mm$$

2) t = 20mm , $l_1 = 250\ mm$

$$l_2 = 16 \cdot t$$
$$l_2 = 16 \cdot 20$$
$$l_2 = 320mm$$

$$l_{uk} = 2 \cdot l_2 + 300 + 50$$
$$l_{uk} = 2 \cdot 320 + 300 + 50$$
$$l_{uk} = 990\ mm$$

3) t = 60mm , $l_1 = 250\ mm$

$$l_2 = 16 \cdot t$$
$$l_2 = 16 \cdot 60$$
$$l_2 = 960\ mm => 400\ mm$$

$$l_{uk} = 2 \cdot l_2 + 300 + 50$$
$$l_{uk} = 2 \cdot 400 + 300 + 50$$
$$l_{uk} = 1150\ mm$$

RAD: STANDARD EN 310

t= 21mm

Fmax = 860N

$$l1 = 20 \cdot t = 20 \cdot 21 = 420mm$$

$$F_2 = 0{,}4 \cdot Fmax = 344N$$

$$F_1 = 0{,}1 \cdot Fmax = 86N$$

$$f_s = \frac{3Fmax \cdot l_1}{2 \cdot b \cdot t^2}$$

$$f_s = \frac{3 \cdot 860 \cdot 420}{2 \cdot 50 \cdot 21^2}$$

$$f_s = \frac{1\,083\,600}{44\,100}$$

$$f_s = 24{,}57\ MPa$$

$$E_m = \frac{M^3 \cdot (F_2 - F_1)}{4 \cdot b \cdot t^3 \cdot (a_1 - a_2)}$$

$$E_m = \frac{420^3 \cdot (344 - 86)}{4 \cdot 50 \cdot 21^3 \cdot (24 - 16)}$$

$$E_m = \frac{19\,114\,720\,400}{14\,817\,600}$$

$$E_m = 1292{,}89\ MPa$$

RAD: STANDARD EN 310

t= 21mm

Fmax = 8600N

$$l_2 = 20 \cdot t = 16 \cdot 21 = 336\,mm$$

$$F_2 = 0{,}4 \cdot Fmax = 3440N$$

$$F_1 = 0{,}1 \cdot Fmax = 860N$$

$$b = 300\,mm$$

$$l_1 = 250\,mm$$

$$f_s = \frac{3Fmax \cdot l_2}{2 \cdot \frac{b \cdot t^2}{6}}$$

$$f_s = \frac{8600 \cdot 336}{2 \cdot \frac{50 \cdot 21^2}{6}}$$

$$f_s = \frac{2\,889\,600}{44\,100}$$

$$f_s = 7\,350\,MPa$$

$$E_m = \frac{l_1^2 \cdot l_2 \cdot (F_2 - F_1)}{16 \cdot \frac{b \cdot t^3}{12} \cdot (a_1 - a_2)}$$

$$E_m = \frac{250^2 \cdot 336 \cdot (3360 - 860)}{16 \cdot \frac{300 \cdot 21^3}{12} \cdot (24 - 16)}$$

$$E_m = \frac{52\,500\,000\,000}{29\,635\,200}$$

$$E_m = 1\,771{,}54\,MPa$$

Datum	Radio/la	Datum	Overio
22.04.2020.	Sanja Vasić		