

**Ministry of Education and
Science of the Republic of
Kazakhstan**



**Karaganda State Industrial
University**

IMPROVING THE RELIABILITY OF METAL STRUCTURES OF BUILDINGS AND STRUCTURES DURING RECONSTRUCTION

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Goal, task

- Strengthen the bearing capacity of building structures
- Identify the performance characteristics of tubular elements that are strained using LDC


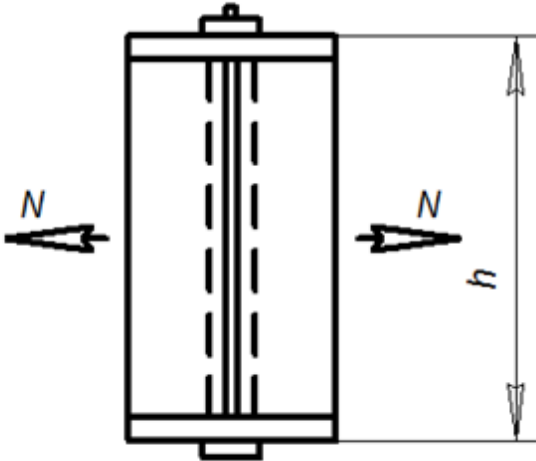
Scientific novelty and practical significance

- Creating pre-stress by non-traditional methods when strengthening the load-bearing capacity of building structures
- The expediency of using new expanding materials in industrial and civil construction is proved from the modern point of view

Relevance

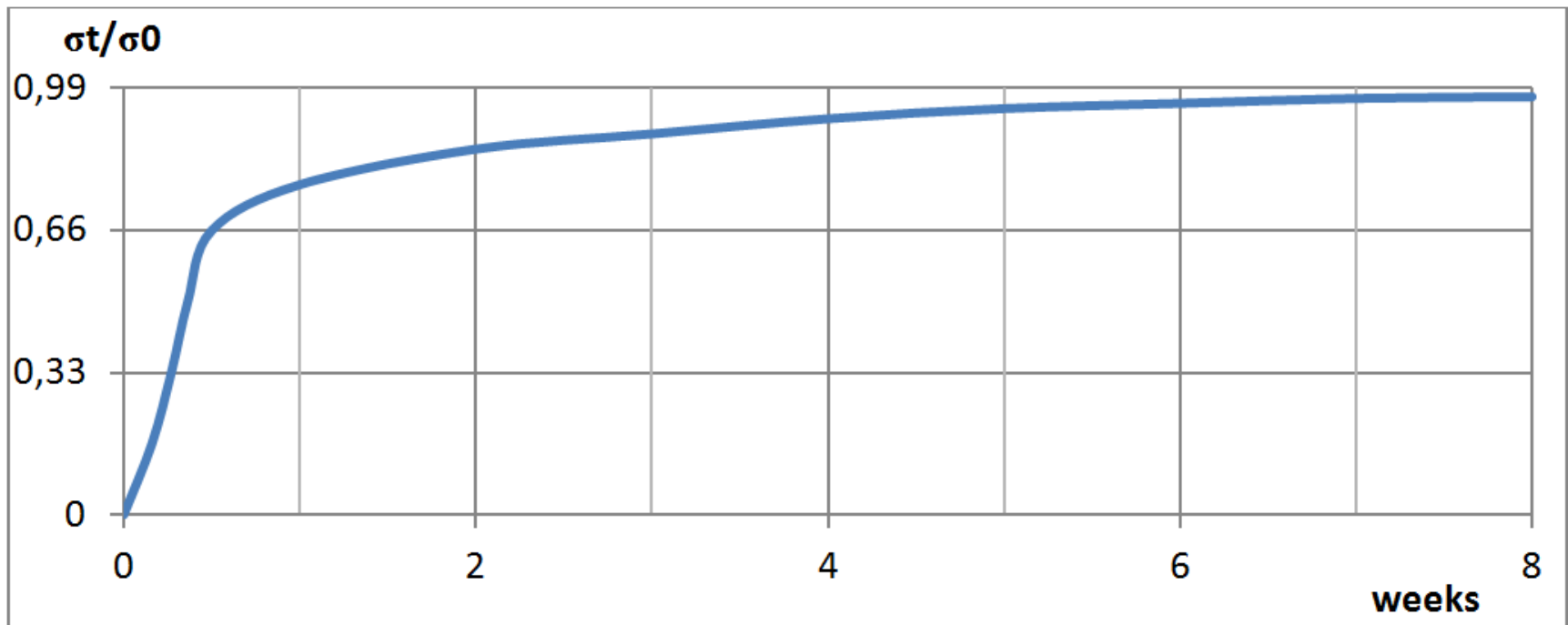
- It consists in searching for the application of non-traditional methods for creating pre-stress in tubular elements using a non-explosive expanding substance

Results of stress determination experiments changes in the working mix (NDM)

Sketch of sliding cylinders	Parameters of cylinders				Results		
	D(cm)	H(cm)	F(cm ³)	n	$\sigma_t=N/F(\text{MPa})$	T(hour)	$\sigma_t/\sigma_{0\text{max}}$
	2.5	2.5	19.6	7	17.0±1.5	24	0.68
	3	6	28.4	7	16.8±1.1	24	0.67
	3.6	4	45.2	7	18.7±0.9	12	0.35
	4	3	37.7	7	18.1±0.8	12	0.34

The student's distribution coefficient for seven repetitions of experiments (n) and the confidence probability $P_S=0.95$ is equal to $t_{\alpha}=2.5$.

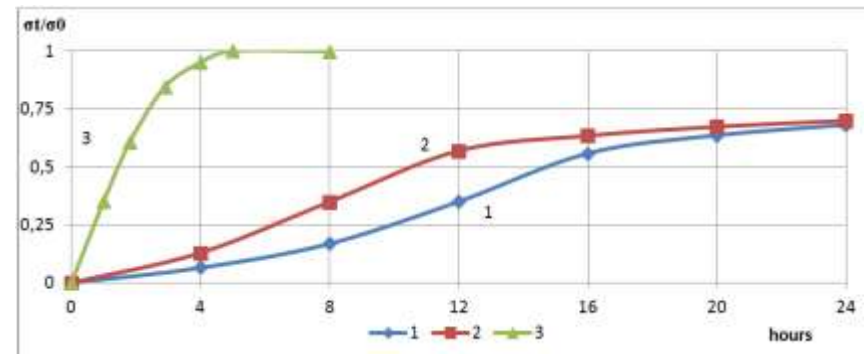
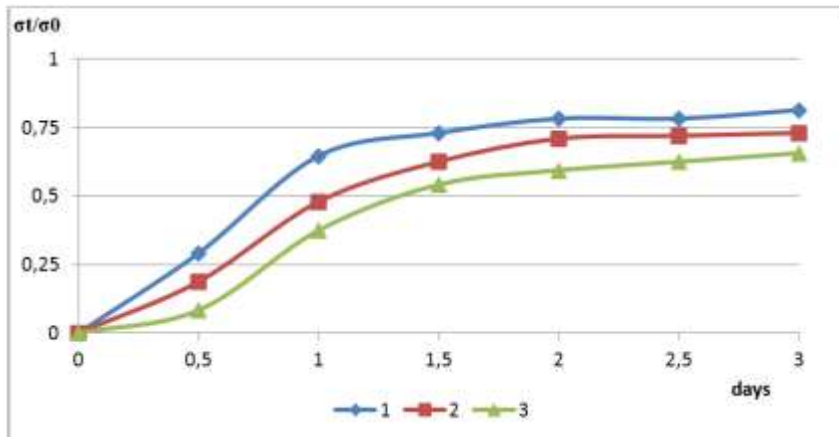
Graph of the intensity of stress growth during the expansion of the working mixture



Stress growth during expansion of the working mixture

Growth of stresses during expansion of the working mixture; 1 – clean working mix; 2 – working mix with 20% sand added by weight; 3 – working mix with 40% sand added by weight

Growth of stresses during the expansion of the working mixture on the first day; 1 – closing the mixture on water at room temperature ; 2 – closing the mixture on water at $t=50-60^{\circ}\text{C}$ and hardening the mixture at 20°C ; 3 – heating the mixture to intensify the hydration process



THANK YOU FOR YOUR ATTENTION

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