Strength analysis

Monitored quantities:

Stress: dislocation on the 3D volume of the loaded body

Deformation: in 3D space, all directions (x, y, z)

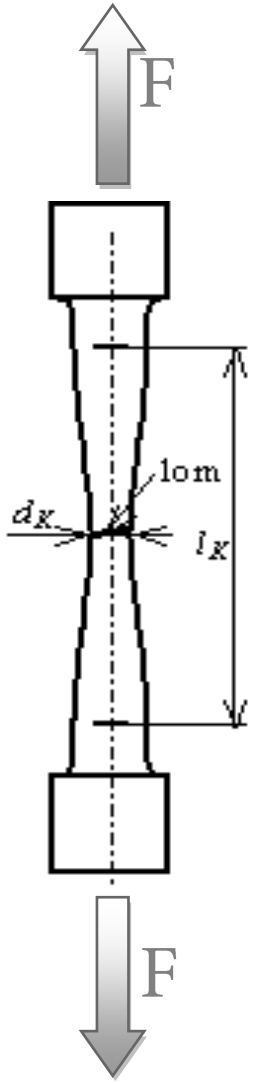
Modulus of elasticity **E** is defined:

Elastic property of the material

but in **uniaxial direction only**.

It needs parameter for

determination deformation in all directions.



Deformation in the perpendicular direction to the load direction

Relative narrowing in a tensile test defined:

Poisson ratio **μ**

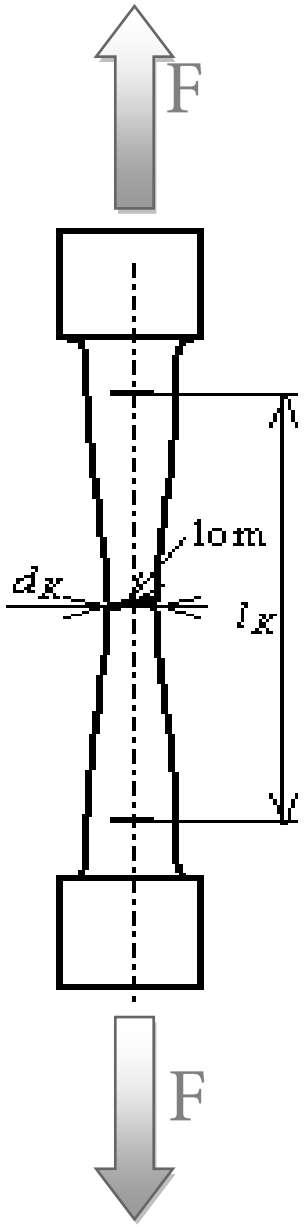
Ratio of relative deformations in 2 perpendicular directions.

$\varepsilon_a / \varepsilon = \mu$ = **ratio,** for steel about **μ = 0,3**

Modulus of elasticity **E** and Poisson ratio **μ**

together define

the elastic properties of the material for 3D.



Material Parameters

for simple FEM task - linear static strength analysis:

E …. Modulus of Elasticity (material **linearity**)

μ …. Poisson ratio

ρ …. Density

Linear static strength FEM analysis

Static: Loads and deformations are constant over time.

(time from 0 to maximal load, possible create movie)