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DOI <https://doi.org/10.30525/978-9934-26-264-7-9>

**TO CALCULATE THE DRIVES OF SCREW COMBINED
CONVEYORS FOR TRANSPORTING WASTE FROM
MECHANICAL INDUSTRIES AND AGRICULTURAL INDUSTRY**

**ДО РОЗРАХУНКУ ПРИВОДІВ ШНЕКОВИХ КОМБІНОВАНИХ
КОНВЕЄРІВ ДЛЯ ТРАНСПОРТУВАННЯ ВІДХОДІВ
МЕХАНІЧНИХ ВИРОБНИЦТВ ТА АГРАРНОЇ
ПРОМИСЛОВОСТІ**

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Knife crushers are used for crushing waste from mechanical industries and the agro-industrial sector, which works according to the kinematic scheme of scissors with the involvement of torque obtained from the drive of the screw conveyor (Fig. 1).

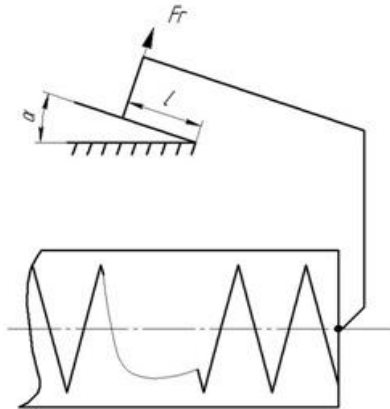


Fig. 1. Calculation scheme of the knife crusher (α -working angle of the knife, F_r – calculated cutting force, l – distance from the chopping line to the knife fixation point, m)

Hydraulic cylinders are used to ensure an alternative flow of energy (in order to reduce energy consumption and save resources due to the lack of use of a separate power source). Among the many advantages of such a drive, there is the main disadvantage – a possible rupture of the bottom of the hydraulic cylinder.

Based on the condition of strength, we have the dimensions of hydraulic cylinders

$$D_z = D_v \sqrt{\frac{[\sigma] + 0,4p_u}{[\sigma] - 1,3p_u}}, \quad (1)$$

where D_z – diameter of the hydraulic cylinder (outer), m;

D_v – cylinder diameter (internal), m;

$[\sigma]$ – permissible tensile stress of the material, MPa;

p_u – liquid pressure (conditional), Pa.

Taking into account the flat shape of the bottom of the cylinder, we determine its thickness

$$h_t = 0,405 D_v \sqrt{\frac{p}{[\sigma]}}; \quad (2)$$

The resulting stresses on the inner surface of the walls are determined from the ratio of the outer diameter to the inner diameter at the place of the smallest thickness of the cylinder wall $k = D_z / D_v$

$$\sigma_r = p \frac{\sqrt{3k^4 + 1}}{(k^2 - 1)}, \quad (3)$$

It is advisable to check the rods, the length of which exceeds ten diameters, for longitudinal bending.

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