

Soil-penetrating working unit consists of a conical nose section, a cylindrical section of the body, and a cylindrical section of smaller diameter, all connected to one another. The base diameter of the conical nose section is greater than the diameter of the cylindrical section of the body, and their ratio is described by the following equation:

$$D_K/D_{II} = 1 + \sigma_1/E_v,$$

where: D_K/D_{II} is the ratio of the base diameter of the conical nose section of the body to the diameter of the cylindrical section of the body; σ_1 is the normal stress in the soil at the boundary of the elastic-plastic deformation zone; E_v is the modulus of volumetric deformation of the soil.