A large vessel of height H, is filled with a liquid of density D, up to the brim. A small hole of radius r is made at the side verticle face, close to the base. The horizontal force is required to stop the gushing of liquid?

Force equals:

$$F = pS$$

where p – pressure, S – area of the hole.

The pressure of liquid at the height H equals:

$$p = DgH$$

where D - density of liquid, g- acceleration due to gravity

Area of the hole equals:

$$S = \pi r^2$$

Therefore:

$$F = DgH\pi r^2$$

Answer: $F = DgH\pi r^2$