

# MOMENTUM TRANSFER

## FLUID PROPERTIES

### APPLICATIONS

#### Exercise 1

Given a volume of oil  $V = 6\text{m}^3$  weighing  $G = 47\text{KN}$ . Calculate the volumetric mass, specific weight, and density of this oil knowing that  $g = 9.81 \text{ m/s}^2$ . Calculate the weight  $G$  and the mass  $M$  of a volume  $V = 3\text{l}$  of gearbox oil with a density equal to  $0.9$ .

#### Exercise 2

Determine the volumetric weight of gasoline knowing that its density  $d = 0.7$ . Given:

- the acceleration due to gravity  $g = 9.81 \text{ m/s}^2$ ;
- the density of water  $\rho = 1000 \text{ kg/m}^3$ .

#### Exercise 3

Determine the dynamic viscosity of a motor oil with density  $d = 0.9$  and kinematic viscosity  $\nu = 1.1 \text{ St}$ .

#### Exercise 4

When compressing a liquid whose initial state parameters are:  $p_1 = 50 \text{ bar}$  and  $V_1 = 30.5 \text{ dm}^3$  and the final state parameters are:  $p_2 = 250 \text{ bar}$  and  $V_2 = 30 \text{ dm}^3$ . Calculate the compressibility coefficient  $\beta$  of this liquid.