

What is impermeability ? How can we calculate it ?

Impermeability is the capacity of fabric at preventing the penetration of rainwater.

We can make clothing waterproof by coating it with a specific membrane.

The Schmerber is the unit of measure for the impermeability of a fabric (measured in mm)

We perform a test with the help of a water column to measure the resistance of the fabric against pressure, using conditions found in the real world.

In fact the exterior of the clothing undergoes a single pressure which affects the two surfaces of the fabric, the internal and external.

This phenomenon allows water that has penetrated the interior of the fabric to be drawn out to the exterior by means of capillary motion.

The average pressure of rainwater varies between 1000 to 2000 Schmerber.

The calculations are performed by a “hydrostatic” test with help from a water column.

The column is filled with water.

The volume of water creates a square inch of pressure on the surface for a period of 24 hours.

The number of ‘mm’ corresponds to the height of the water column (in millimetres) that the fabric can support without letting water pass through. (1 Schmerber = 1 mm water column)

See EN20811 standard

= Determination of resistance of textile fabrics to water penetration - hydrostatic pressure test

What is breathability ? How can we calculate it ?

Breathability of a fabric is a measure of its ability to remove water vapour.

Fabric that has good breathability limits the amount of water vapour condensing on the interior of clothing.

This eases the removal of sweat and keeps the body dry.

It is measured in gr/m² in 24h, and measures the litres of water, in the form of vapour, that the fabric lets through within 24 hours. The greater the number, the greater the breathability.

The thermal evaporation resistance confines to the standard ISO 11092:1993.

(Textiles—physiological effects—measurement of thermal and water vapour resistance under steady-state conditions)

How can fabric be impermeable yet breathable at the same time?

The membrane (or coating) contains millions of microscopic pores each cm², big enough to let water vapour pass through (sweat), but small enough to block the penetration of rainwater