Definitions: Resistance, Specific resistance (resistivity), Conductance, Specific conductance (conductivity)

http://glassproperties.com/resistivity

Ohm's law:

$R = E / I$

R - **Resistance** in V/A = Ω (Ohm)
E - Voltage or potential difference in Volts, V
I - Current in Amperes, A

If a material has a resistance of 1 Ω, it means that when applying a potential difference of 1 V, the current in the material is 1 A.

The **conductance** G is the inverse of the resistance; unit: Ω^{-1} = S (Siemens):

$G = 1 / R$

The Resistance is proportional to distance between the electrodes and inversely proportional to the surface area of the electrodes.

$\rho = R \cdot A / L$

ρ - **Specific resistance** or **resistivity** in Ω · m
R - Resistance in Ω
A - Surface area of electrodes in m^2
L - Distance between the electrodes in m

A specific resistance of 1 Ω · m means that a cubic block of a material with the volume of 1 m^3 has a resistance of 1 Ω, i.e. a cubic block with the volume of 1 cm^3 has a resistance of 10^{-2} Ω.
1 Ω · m = 100 Ω · cm

The conductivity or specific conductance is the inverse of the specific resistance:

$K = 1 / \rho$

K - **Conductivity** or **specific conductance** in $\Omega^{-1} \cdot m^{-1}$ = S / m (S = Siemens = 1 / Ω)