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

http://glassproperties.com/resistivity

Ohm's law:
\[ R = \frac{E}{I} \]

**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: \( \Omega^{-1} = S \) (Siemens):
\[ G = \frac{1}{R} \]

The Resistance is proportional to distance between the electrodes and inversely proportional to the surface area of the electrodes.
\[ \rho = \frac{R \cdot A}{L} \]

\( \rho \) - **Specific resistance** or resistivity in Ω · m
**R** - Resistance in Ω
**A** - Surface area of electrodes in m²
**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 m³ has a resistance of 1 Ω, i.e. a cubic block with the volume of 1 cm³ has a resistance of \( 10^5 \) Ω.*

1 Ω · m = 100 Ω · cm

The conductivity or specific conductance is the inverse of the specific resistance:
\[ K = \frac{1}{\rho} \]

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