

# Corrosion Glossary

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**macroscopic.**

Visible at magnifications to 25x.

**macrostructure.**

The structure of metals as revealed by macroscopic examination of the etched surface of a polished specimen.

**magnetite.**

Naturally occurring magnetic oxide of iron ( $\text{Fe}_3\text{O}_4$ ).

**martensite.**

A generic term for microstructures formed by diffusionless phase transformation in which the parent and product phases have a specific crystallographic relationship. Martensite is characterized by an acicular pattern in the microstructure in both ferrous and nonferrous alloys. In alloys where the solute atoms occupy interstitial positions in the martensitic lattice (such as carbon in iron), the structure is hard and highly strained; but where the solute atoms occupy substitutional positions (such as nickel in iron), the martensite is soft and ductile. The amount of high-temperature phase that transforms to martensite on cooling depends to a large extent on the lowest temperature attained, there being a rather distinct beginning temperature ( $M_s$ ) and a temperature at which the transformation is essentially complete ( $M_f$ ).

**mechanical plating.**

Plating wherein fine metal powders are peened onto the work by tumbling or other means.

**metal dusting.**

Accelerated deterioration of metals in carbonaceous gases at elevated temperatures to form a dustlike corrosion product; a unique form of high temperature corrosion which forms a dust-like corrosion product and sometimes develops hemispherical pits on a susceptible metal surface; simultaneous carburization is generally observed.

**metal ion concentration cell**

A galvanic cell caused by a difference in metal ion concentration at two locations on the same metal surface.

**metallic glass.**

An alloy having an amorphous or glassy structure. See also *amorphous solid*.

**metallizing.**

(1) The application of an electrically conductive metallic layer to the surface of nonconductors. (2) The application of metallic coatings by

**meteor perforation**

Perforation of material in outer space resulting from meteor strikes.

**microbial corrosion.**

See *biological corrosion*.

**microscopic.**

Visible at magnifications above 25x.

**microstructure.**

The structure of a prepared surface of a metal as revealed by a microscope at a magnification exceeding 25x.

**mill scale.**

The heavy oxide layer formed during hot fabrication or heat treatment of metals.

**mixed potential.**

The *potential* of a specimen (or specimens in a *galvanic couple*) when two or more electrochemical reactions are occurring. Also called galvanic couple potential.

**molal solution.**

Concentration of a solution expressed in moles of solute divided by 1000 g of solvent.

**molar solution.**

Aqueous solution that contains 1 mole (gram-molecular weight) of solute in 1 L of the solution.

**mole.**

One mole is the mass numerically equal (in grams) to the relative molecular mass of a substance. It is the amount of substance of a system that contains as many elementary units ( $6.023 \times 10^{23}$ ) as there are atoms of carbon in 0.012 kg of the pure nuclide  $\text{C}^{12}$ ; the elementary unit must be specified and may be an atom, molecule, ion, electron, photon, or even a specified group of such units.

**money-penny-strauss test.**

Corrosion testing in a copper-sulfate solution containing sulfuric acid. Used to detect the susceptibility of stainless steel to intergranular corrosion.

**monomer.**

A molecule usually an organic compound, having the ability to join with a number of identical molecules to form a *polymer*.

nonelectrolytic procedures such as spraying of molten metal and deposition from the vapor phase.