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You are here: [Resources](#) > [Corrosion Glossary](#) > B

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[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

B

backfill

Material placed in a drilled hole to fill space around anodes, vent pipe, and buried components of a cathodic protection system.

bainite

A metastable aggregate of ferrite and cementite resulting from the transformation of austenite at temperatures below the pearlite range but above the martensite start temperature. Bainite formed in the upper part of the bainite transformation range has a feathery appearance; bainite formed in the lower part of the range has an acicular appearance resembling that of tempered martensite.

banded structure

A segregated structure consisting of alternating nearly parallel bands of different composition, typically aligned in the direction of primary hot working.

base

A chemical substance that yields hydroxyl ions (OH) when dissolved in water. Compare with acid.

base metal

(1) The metal present in the largest proportion in an alloy; brass, for example, is a copper-base alloy. (2) An active metal that readily oxidizes, or that dissolves to form ions. (3) The metal to be brazed, cut, soldered, or welded. (4) After welding, that part of the metal which was not melted.

beach marks

Macroscopic progression marks on a fatigue fracture or stress-corrosion cracking surface that indicate successive positions of the advancing crack front. The classic appearance is of irregular elliptical or semielliptical rings, radiating outward from one or more origins. Beach marks (also known as clamshell marks or arrest marks) are typically found on service fractures where the part is loaded randomly, intermittently, or with periodic variations in mean stress or alternating stress. See also striation.

biaxial stress

See principal stress (normal).

bimetallic corrosion

(Galvanic Corrosion) Corrosion resulting from dissimilar metal contact.

biological corrosion

Deterioration of metals as a result of the metabolic activity of microorganisms.

bipolar electrode

An electrode in an electrolytic cell that is not mechanically connected to the power supply, but is so placed in the electrolyte, between the anode and cathode, that the part nearer the anode becomes cathodic and the part nearer the cathode becomes anodic. Also called intermediate electrode.

bituminous coating

Coal tar or asphalt-based coating.

black liquor

The liquid material remaining from pulpwood cooking in the soda or sulfate paper-making process.

black oxide

A black finish on a metal produced by immersing it in hot oxidizing salts or salt solutions.

blister

A raised area, often dome shaped, resulting from (1) loss of adhesion between a coating or deposit and the base metal or (2) delamination under the pressure of expanding gas trapped in a metal in a near-subsurface zone. Very small blisters may be called pinhead blisters or pepper blisters.

blow down

(1) Injection of air or water under high pressure through a tube to the anode area for the purpose of purging the annular space and possibly correcting high resistance caused by gas blocking. (2) In connection with boilers or cooling towers, the process of discharging a significant portion of the aqueous solution in order to remove accumulated salts, deposits, and other impurities.

blue brittleness

Brittleness exhibited by some steels after being heated to a temperature within the range of about 200 to 370C 400 to 700F), particularly if the steel is worked at the elevated temperature.

blushing

Whitening and loss of gloss of a usually organic coating caused by moisture. Also called blooming.

brackish water

(1) Water having salinity values ranging from approximately 0.5 to 17 parts per thousand. (2) Water having less salt than seawater, but undrinkable.

breakdown potential

The least noble potential where pitting or crevice corrosion, or both, will initiate and propagate.

brightener

[HOME](#)[MATERIALS TECHNOLOGY](#)[WELDING TECHNOLOGY](#)[NON-DESTRUCTIVE TESTING](#)[CALIBRATION CENTRE](#)[DIMENSIONAL TESTING](#)[CERTIFICATION OF PERSONNEL](#)[TRAINING](#)[SHRIMP ON](#)

A A A I | EN

HOME

[COMPANY PROFILE](#)
[LABS LOCATION](#)
[ACCREDITATIONS AND RECOGNITIONS](#)
[NEWS](#)
[GLOSSARY OF TERMS](#)
[TEC EUROLAB CHANNEL](#)
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Certif. and
Inspect.
bodies

Back abstract:
 R-curve, Radial marks,
 Radiation, Radiation Absorbed
 Dose (RAD), Radiation

Glossary of terms[A-B](#)[E-F](#)[G-L](#)[M-Q](#)[T-Z](#)[Other](#)**MATERIALS TECHNOLOGY - GLOSSARY****R-curve**

A plot of crack-extension resistance as a function of stable crack extension, which is the difference between either the physical crack size or the effective crack size and the original crack size. R-curves normally depend on specimen thickness and, for some materials, on temperature and strain rate.

MATERIALS TECHNOLOGY - GLOSSARY**Radial marks**

Lines on a fracture surface that radiate from the fracture origin and are visible to the unaided eye or at low magnification. Radial marks result from the intersection and connection of brittle fractures propagating at different levels. Also known as shear ledges. See also chevron pattern.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radiation**

Energy traveling in the form of electromagnetic waves or photons.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radiation Absorbed Dose (RAD)**

The quantity that expresses the amount of energy which ionizing radiation imparts to a given mass of matter.

MATERIALS TECHNOLOGY - GLOSSARY**Radiation damage.**

A general term for the alteration of properties of a material arising from exposure to ionizing radiation (penetrating radiation), such as x-rays, gamma rays, neutrons, heavy-particle radiation, or fission fragments in nuclear fuel material. See also neutron embrittlement.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radioactive Material**

Includes any such material whether or not subject to licensing control by the commission.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radiographer**

Any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of these regulations and the conditions of the licenses.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radiographic Film**

A type of film that is sensitive to a certain type of radiation allow an image to form when exposed.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radiographic Interpretation**

The determination of the cause and significance of subsurface discontinuities indicated on the radiograph. The evaluation as to the acceptability or rejectibility of the materials is based upon the judicious application of the radiographic specifications and standards governing the material.

NON-DESTRUCTIVE TESTING - GLOSSARY**Radiography**

The process of making a radiograph

WELDING TECHNOLOGY - GLOSSARY**Range of qualification**

Extent of qualification for an essential welding variable.

MATERIALS TECHNOLOGY - GLOSSARY**Ratchet marks**

Lines on a fatigue fracture surface that result from the intersection and connection of fatigue fractures propagating from multiple origins. Ratchet marks are parallel to the overall direction of crack propagation and are visible to the unaided eye or at low magnification.

original dimensions of the cross section of the specimen. Stress can be either direct (tension or compression) or shear. Usually expressed in pounds per square inch (psi) or megapascals (MPa).

MATERIALS TECHNOLOGY - GLOSSARY

Stress amplitude

One-half the algebraic difference between the maximum and minimum stress in one cycle of a repetitively varying stress.

MATERIALS TECHNOLOGY - GLOSSARY

Stress concentration

A change in contour or a discontinuity that causes local increases in stress in materials under load. Typical are sharp-cornered grooves or notches, threads, fillets, holes, etc. Also called stress raiser.

NON-DESTRUCTIVE TESTING - GLOSSARY

Stress Corrosion

Preferential attack area under stress in a corrosive environment, where such an environment alone would not have caused corrosion.

MATERIALS TECHNOLOGY - GLOSSARY

Stress cycle

The smallest segment of the stress-time function that is repeated periodically.

MATERIALS TECHNOLOGY - GLOSSARY

Stress raiser

See stress concentration.

MATERIALS TECHNOLOGY - GLOSSARY

Stress ratio, A or R

The algebraic ratio of two specified stress values in a stress cycle. Two commonly used stress ratios are (1) the ratio of the alternating stress amplitude to the mean stress, $A = S_a/S_m$, and (2) the ratio of the minimum stress to the maximum stress, $R = S_{min}/S_{max}$

MATERIALS TECHNOLOGY - GLOSSARY

Stress-concentration factor, K_t

A multiplying factor for applied stress that allows for the presence of a structural discontinuity such as a notch or hole; K_t equals the ratio of the greatest stress in the region of the discontinuity to the nominal stress for the entire section. Also known as theoretical stressconcentration factor.

MATERIALS TECHNOLOGY - GLOSSARY

Stress-corrosion cracking, SCC.

A cracking process that requires the simultaneous action of a corrodent and sustained tensile stress. This excludes corrosion-reduced sections that fail by fast fracture. It also excludes intergranular or transgranular corrosion, which can disintegrate an alloy without applied or residual stress. See also corrosion.

MATERIALS TECHNOLOGY - GLOSSARY

Stress-intensity factor, K

A scaling factor used in linear-elastic fracture mechanics to describe the intensification of applied stress at the tip of a crack of known size and shape. At the onset of rapid crack propagation in any structure containing a crack, the factor is called the critical stress-intensity factor, or the fracture toughness.

MATERIALS TECHNOLOGY - GLOSSARY

Stress-rupture strength

See creep-rupture strength.

MATERIALS TECHNOLOGY - GLOSSARY

Stress-strain curve

See stress-strain diagram.

MATERIALS TECHNOLOGY - GLOSSARY

Stress-strain diagram

A graph in which corresponding values of stress and strain are plotted against each other. Values of stress are usually plotted vertically (ordinate or y axis) and values of strain horizontally (abscissa or x axis). Also known as deformation curve and stress-strain curve.

MATERIALS TECHNOLOGY - GLOSSARY

Stretcher strains

See Lueders lines.

MATERIALS TECHNOLOGY - GLOSSARY

Striation

A fatigue fracture feature often observed in electron micrographs that indicates the position of the crack front after each succeeding cycle of stress. The distance between striations indicates the advance of the crack front across that crystal during one stress cycle, and a line normal to the striation indicates the direction of local crack propagation. Not to be confused with beach marks, which are much larger (macroscopic and form differently).

MATERIALS TECHNOLOGY - GLOSSARY

Stringer

In wrought materials, an elongate configuration of microconstituents or foreign material aligned in the direction of working. The term is commonly associated with clot gated oxide or sulfide inclusions in steel.

MATERIALS TECHNOLOGY - GLOSSARY

Sub-boundary structure (subgrain structure)

A network of low-angle boundaries usually with misorientations less than 1 within the main grains of a microstructure.

MATERIALS TECHNOLOGY - GLOSSARY

Subgrain

A portion of a crystal or grain, with an orientation slightly different from the orientation of neighboring portions of the same crystal.