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The technical terminology of
the copper industry of Canada

A GLOSSARY

ENGLISH-FRENCH

PUBLISHED JOINTLY BY THE DEPARTMENT OF INDUSTRY,
TRADE AND COMMERCE, OTTAWA, AND THE CANADIAN
COPPER & BRASS DEVELOPMENT ASSOCIATION

INTRODUCTION

Increasing amounts of technical information are required to ensure maximum efficiency and to keep abreast of technological developments. This is especially true in Canada due to the industrial growth and the greater sophistication of the products being manufactured. Communication also becomes a vital factor, and reliable and rapidly understood communication calls for standardized technical terminology.

It was for these reasons that this Glossary has been produced and the technical terminology it contains is intended to apply to the copper industry of Canada. Many of the French language terms are similar to those used in France or other French speaking countries, but there are some French terms that apply only to Canada.

At the outset, it was realized that it was not sufficient to have simply a technical term in one language and then the equivalent term in the other language. When using the Glossary, the reader will appreciate that unless the definition of the term is read and its meaning confirmed, the translated term will be of little value. The Glossary, in a French-English direction, commences at the other end of this publication.

The major portion of the work on the Glossary has been carried out by an Editorial Committee made up of representatives from our Member Companies. The names of the Committee and our Member Companies are listed on this page. A publication of this type, especially in these times of expanding technology, is out of date almost on the day that it is published. Consequently, up-dating and reprinting will be made as deemed necessary and our Committee will be pleased to receive any comments our readers may have.

We wish to thank the American Society for Metals and the Copper Development Association of the U.S.A., whose Handbooks were used as references in preparing the English definitions. Also, our thanks to the copper development association of France (Centre d'Information Cuivre, Laitons, Alliages) and the International Wrought Copper Council, for their assistance with the French definitions and terminology.

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**Acid Dip / Fini à l'acide**

A dip solution commonly consisting of sulphuric acid, nitric acid, hydrochloric acid, and water, used to give a bright surface to brasses.

Acid Dipped-Dry Rolled Finish / Décapé et laminé à sec (See Finish)**A.C.R. Tube / Tube A.C.R. (See Tube)****Admiralty Brass / Laiton amirauté (See Copper Alloy)****Admiralty, Inhibited / Laiton amirauté inhibé (See Copper Alloy)****Age Hardening / Durcissement par vieillissement**

A process of increasing the hardness and strength by the precipitation of particles of a phase from a super-saturated solid solution alloy.

Air Conditioning / Climatatisation

Control of the temperature, humidity, motion, and other conditions of the atmosphere.

Air Stain / Tarnissement à l'air (See Stain)**Alloy / Alliage**

A substance having metallic properties and composed of two or more elements, at least one of which is a metal.

Alloying Elements / Éléments d'addition

Elements added to a metal to effect changes in properties and which remain within the metal.

Alpha / Alpha

The name of a phase or of a certain range of copper alloys which contain one or more alloying elements dissolved in copper, the phase being a homogeneous solid solution.

Aluminum Brass / Laiton d'aluminium (See Copper Alloy)**Aluminum Bronze / Bronze d'aluminium (See Copper Alloy)****Angle / Angle**

A shape consisting of two straight legs meeting in a right angle, usually but not necessarily of equal length and with a sharp or slightly rounded corner and with or without fillets.

Annealed Temper / État recuit (See Temper)**ANNEALING / RECUIT**

A process involving heating and cooling designed to effect.

1. softening of a cold-worked structure
2. softening of an age-hardened alloy
3. relief of residual stress

Bright Annealing / Recuit brillant

Annealing in a protective or inert atmosphere to prevent discoloration by oxidation of the bright surface.

Continuous Annealing / Recuit de passage

Annealing operation which continuously anneals metal.

Finish Annealing / Recuit de finition

Annealing operation to convert work-hardened metal to annealed temper for a finished product.

Induction Annealing / Recuit par induction

Annealing operation in which heat is supplied by electrical induction.

Resistance Annealing / Recuit par résistance

Annealing operation in which heat is supplied by electrical resistance in the metal being annealed.

Anode / Anode

1. In corrosion processes, usually the metal that has the greater tendency to dissolve.
2. In electroplating, the positive electrode used in a plating bath.

Anode Casting / Coulée en anodes (See Casting)**Anvil Effect / Bourrelet d'empreinte**

In an indentation hardness test, the bulge formed on the anvil side of the specimen which indicates that the hardness determination is of questionable accuracy.

Applied Stresses / Efforts appliqués (See Stress)**Arbor / Arbre ou Mandrin**

Cylindrical core around which metal is wound to obtain a desired inside diameter of the wound coil or roll.

Architectural Bronze / Bronze architectural (See Copper Alloy)**Arc Melting / Fusion à l'arc (See Melting)****Area Reduction / Réduction de section**

The decrease in cross-section of a product by rolling or drawing. This is a measure of the temper of metal in the cold worked condition.

Arsenical Tough Pitch Copper / Cuivre à l'arsenic non désoxydé (See Copper)

As-Cast / Brut de coulée, Brut de fonderie

A condition of a metal product which has been produced by casting, before there has been any further work or treatment.

As-Extruded / Tel que filé

A condition of a metal mill product resulting from hot-extrusion; soft, not cleaned nor drawn or rolled to size.

As-Hot-Rolled / Tel que laminé à chaud

A condition of a metal mill product resulting from hot rolling; soft, not cleaned nor drawn or rolled to size.

As-Welded / Brut de soudage

A condition of a metal product after welding, before there has been any further work or treatment.

Atmospheric Corrosion / Corrosion atmosphérique (See Corrosion)

Atomic Weight / Masse atomique

The relative weights of the atoms of the different elements, expressed on a scale in which the atomic weight of oxygen is taken to be 16.000.

Automatic Brazing / Brasage automatique (See Brazing)

Automotive Service Tube / Tubes pour l'industrie automobile (See Tube)

Bar / Barre

A solid rectangular section, or one with two plane parallel surfaces and round or other simple regularly shaped edges, up to and including 12in. in width and over .188in. in thickness.

Barrel Plating / Placage au tonneau

A method of plating small parts in which the parts are placed in a perforated barrel, which revolves partially submerged in a plating solution.

Barrel Rolling (or Tumbling) / Polissage au tonneau (Finition au tonneau)

A method of polishing small parts in which the parts and a polishing medium are placed in a barrel, the polishing action resulting from the revolving of the barrel.

Baseboard Units / Convecteurs-plinthes

Heating convectors for hydronic (hot water) heating, resembling a baseboard in appearance and installation.

Beading / Bourrelet (Fabrication de)

The process of forming a lip or groove around the body of a shell by means of suitably shaped interior and exterior rolls.

Bearing / Coussinet

A metal support for a revolving axle or shaft.

Bearing Bronze / Bronze pour coussinets (See Copper Alloy)

BENDING / CINTRAGE OU PLIAGE

A fabrication method to obtain a product of the required shape, usually by means of a bending machine or other mechanical device.

Roll Bending / Cintrage par rouleaux

Obtaining desired curvature in sheet metal, bar, or sections by means of rolls.

Bend Test / Essai de pliage (See Tests)

Beryllium Copper / Cuivre au béryllium (See Copper Alloy)

Beta / Bêta

The name of a second phase in the internal structure of certain copper alloys, generally harder and less ductile than the alpha phase.

Bichromate Dipped Finish / Fini bichromaté (See Finish)

Billet / Billette

A solid cylindrical casting used for hot extrusion into rod, bar, tube, or shape or for hot piercing into tube.

Bimetal Tube / Tube bimétallique (See Tube)

Blank / Découpe

A piece from any wrought product intended for subsequent fabrication by such operations as, forming, bending, cupping, drawing, hot pressing.

Blanking / Découpage au poinçon

The process of cutting metal blanks by a die and punch set in a press, or by sawing or shearing.

Blister Copper / Cuivre « Blister »

Boiling Point / Point d'ébullition

The temperature at which a substance boils. Copper boils at 4703°F or 2595°C.

Bonding Resin / Résine liante

Thermosetting plastic resin which is mixed with sand, formed on a pattern, and cured by heat to produce a shell mold in which metal is cast.

Boring (Drilling) / Perçage (forage)

A machining operation using single-point tools for producing holes or cylindrical cavities.

Bornite / Bornite

Suitable ore mineral of copper and iron containing 55.5% copper and commonly known as "peacock ore" because of its iridescent purple colour.

Bourdon Gauge Tube / Tube de Bourdon (See Tube)**Brass Foundry / Fonderie de laiton**

General term for a plant producing copper and copper-alloy castings.

Brazed Tube / Tube roulé-brasé (See Tube)**Braze Welding / Brasage fort ou à l'argent**

A method of welding whereby a groove fillet, plug or slot weld is made using a non-ferrous filler metal having a melting point below that of the base metals but above 800F. The filler metal is not distributed in the joint by capillary attraction. (The term "Bronze Welding", formerly used, is a misnomer for the process).

BRAZING / BRASAGE

A joining process wherein coalescence is produced by heating to suitable temperatures above 800F and by using a non-ferrous filler metal having a melting point below that of the base metals. The filler metal is distributed between the closely fitted surfaces of the joint by capillary attraction. (See also *Soldering*)

Automatic Brazing / Brasage automatique

A mechanical brazing operation in which the assembly to be joined is loaded, and usually followed by automatic application of required amounts of flux, heat and filler metal to the joint area.

Diffusion Brazing / Brasage par diffusion

A bonding process which relies on a thin layer of liquid-phase alloy, at the joint interface, diffusing into the metals being joined.

Salt Bath Brazing / Brasage par bain de sel

A process where the joints to be made are pre-loaded with brazing alloy or solder, and immersed into molten flux.

Brazing Rod / Baguette pour brasage

Rod which is manufactured to special chemical composition for use in joining metals by brazing.

Brazing Filler Metal / Métal d'apport pour brasage

Wire, rod strip or powder which is manufactured to special chemical composition for use in joining metals by brazing.

Bridge Plate / Plaque d'appui de pont

A low-friction plate of a copper alloy used to provide bearing for expansion end of trussed bridge structures.

Bright Annealed Finish / Fini recuit brillant (See Finish)**Bright Annealing / Recuit brillant (See Annealing)****Bright Dipped Finish / Fini brillanté (See Finish)****Brinell Hardness Test / Essai de dureté Brinell (See Tests)****Brittleness (Temper) / Fragilité**

The quality of a metal that leads to crack propagation without appreciable plastic deformation.

Bronze Fittings / Raccords en bronze

Tube joining fittings made of bronze.

Bronze valves / Valves en bronze

A flow control device made of bronze.

Brush Brass Finish / Fini brossé (See Finish)**Buck / Croisillon**

A device on which flat wire and strip are wound to facilitate handling and shipping.

Buckle / Ondulation du centre

Alternate bulges and hollows recurring along the length of a flat product with the edges remaining relatively flat.

Buffed Surface Finish / Fini bufflé (See Finish)**Buffing / Bufflage ou Avivage**

The finishing of metal surfaces by rubbing with a compound applied to the pliable rim of a wheel usually consisting of a large number of treated or untreated muslin discs sewed together, and which rotates at high speed.

Bulging (tubes) / Gonflement (tubes)

The expanding of a portion of the body of a drawn shell below the top or neck.

Bunch Coil / Couronne bottelée (See Coil)**Burnishing / Brunissage**

A fabrication method of securing a smooth finished surface by slight deformation with highly polished tools.

Burr / Bavure

The thin ridge or roughness left by a cutting operation such as slitting, shearing, blanking or sawing.

Bursting Pressure / Pression d'éclatement

The internal pressure required to burst tubes or other hollow products.

Bus Bar, Bus Conductor / Barre omnibus

Rigid, high conductivity copper electrical conductor of tubular or solid section.

Bus Conductor Stock / Méplat pour barres omnibus

A bar, rod, shape or tube of high conductivity copper used for manufacture of bus conductor or bus bar.

Butt Seam Tube / Tube roulé (See Tube)**Cadmium Copper / Cuivre au cadmium (See Copper)****Capacitor Plate Stock / Bande pour condensateur**

Strip manufactured to special flatness and thickness tolerances for use in electrical variable condensers.

Capillary Tube / Tube capillaire (See Tube)**Carbon-Arc Welding / Soudage à l'arc au carbone (See Welding)****Cartridge Brass / Laiton jaune à cartouche 70-30 (See Copper Alloy)****Cast Bar / Barre coulée**

Flat casting for rolling into sheet and strip, or round casting for rolling and drawing into wire.

Cast Shell Process / Procédé de coulée d'ébauches tubulaires

A process for making seamless brass tube whereby the brass is cast in the form of a shell or tube and subsequently reduced to the finished size by a series of suitable alternate cold drawing and annealing operations.

CASTING**1. A Casting: / Pièce Coulée**

An article formed by solidification of molten metal in a mold.

2. To Cast: / Coulée

Pouring molten metal into a mold to produce an object of desired shape.

Anode Casting / Coulée en anodes

A refinery operation in which copper is melted and fire-refined in reverberatory furnaces and then cast into anodes for use in the electrolytic refining process.

Centrifugal Casting / Coulée centrifuge

1. A casting made by pouring molten metal into a mold that is being rotated.

2. Casting method in which molten metal is poured into a mold that is being rotated or revolved.

Chill Casting / Coulée à refroidissement rapide (See Permanent Mold Casting)

Term used for permanent mold casting.

Continuous Casting / Coulée continue

1. A rod, bar, tube or other shape made by the continuous solidification of metal in a mold of suitable cross-sectional shape, with the solidified metal being withdrawn in a continuous length.

2. Casting method in which molten metal is continuously fed to and solidified in a mold of suitable cross-sectional shape, with the solidified rod, bar, tube or other shape being withdrawn in a continuous length at a steady and controlled speed.

Core-Mold Casting / Coulée avec moule et noyau

Casting in a mold, where core(s) shape(s) the interior or exterior of a casting.

Die Casting / Coulée sous pression

1. A casting made by forcing molten metal under considerable pressure into the cavity of a metal mold.

2. Casting method in which molten metal is forced under considerable pressure into the cavity of a metal mold.

Gravity Die Casting / Coulée par gravité en moule métallique (See Permanent Mold Casting)

Term sometimes used for permanent mold casting.

Investment Casting / Moulage en cire perdue

Casting metal into a mold produced by surrounding (investing) an expendable pattern (wax, plastic or frozen mercury) with a refractory slurry that sets at room temperature after which the wax, plastic or frozen mercury pattern is removed through the use of heat. It is also called precision casting or the lost-wax process.

Permanent Mold Casting / Coulée en moule permanent

1. Casting method in which molten metal is poured into a mold constructed from chill material (metal, graphite, etc.) and having two or more parts that are used repeatedly for the production of many castings of the same form or shape.

2. A casting made by the permanent mold method.

Precision Casting / Coulée de précision (See Investment Casting)

Term sometimes used for Investment Casting.

Sand Casting / Coulée en sable

Process in which molten metal is poured into a sand mold to produce an object of a desired shape.

Semi-Continuous Casting / Coulée semi-continue

Casting method in which molten metal is poured slowly into a special water-cooled mold, the bottom of which is slowly lowered as solidification progresses. Rate of pouring is adjusted to equal the rate of withdrawal of the solidified billet from the underside of the mold.

Shell-Mold Casting / Coulée en coquille (See Shell Molding)

Pouring molten metal into a mold produced by the shell molding method.

Slush Casting / Coulée renversé

A hollow casting normally made of low melting point metal. As soon as the desired thickness of the metal is solidified, the remaining liquid is poured out of the mold.

Cathode / Cathode

1. In corrosion processes, usually the metal that is not corroded.
2. Cathode Copper

Cathode Copper / Cathode en cuivre (See Copper)**Cathodic Protection / Protection cathodique**

Reduction or prevention of corrosion of a metal surface by making it a cathode.

Cavitation / Cavitation (See Corrosion—Erosion)**Centrifugal Casting / Coulée centrifuge (See Casting)****Chalcocite / Chalcocite ou Chalcosine**

Cuprous sulphide ore mineral containing 79.8% copper, and a slate-grey in colour.

Chalcopyrite / Chalcopyrite

Sulphide ore mineral of copper and iron containing 34.5% copper, and yellow in colour.

Chamfer / Chanfrein

The bevelled surface normally at a 15° to 45° angle, to eliminate a sharp corner or edge.

Channel / Profilé en "U"

A shape having two straight flanges or legs of equal length, extended at right angles from same side of the edges of a web or base, the legs and base having sharp or slightly rounded corners, and with or without fillets.

Chatter Marks / Marques de broutage

A series of transverse ripples encircling a drawn product visible on outer or inner surfaces.

Chemical Colouring / Coloration chimique (See Colouring)**Chill Casting / Coulée à refroidissement rapide (See Casting)****Chromium Copper / Cuivre au chrome (See Copper)****Chrysocolla (Green) / Chrysocolle (vert)**

Oxide ore mineral of copper, containing 36.0% copper.

Circle / Disque ou flan

A completely round, commercially flat, solid blank made from a flat rolled product.

Cladding / Plaquage

Bonding of two dissimilar sheets of plates.

Clamp / Serre-joint

Device for fastening or holding objects together.

Closed-Die Forging / Forgeage en matrice fermée (See Forging)**Coalesced Copper / Cuivre coalescé (See Copper)****Coated Metal Arc Welding / Soudage avec électrodes enrobées (See Welding)****Coefficient of Linear Expansion / Coefficient de dilation linéaire**

The increment of length in a unit of length for a change in temperature of 1 degree.

COIL / ROULEAU

A length of a product other than a flat rolled or flat drawn product, wound into a merchantable hoop-like bundle.

Bunch Coil / Couronne bottlée

A coil helically wound and subsequently bunched. (The unqualified term "coil" applied to either tube or wire would normally indicate a bunch coil).

Double Layer Flat Coil / Couronne à double hélice à plat

A coil in the form of two flat spirally wound layers (applied particularly to copper water tube or refrigeration service tube).

Helical Coil / Couronne hélicoïdale

A coil in the form of a regular cylindrical helix.

Single Layer Flat Coil / Couronne à plat à simple enroulement

A coil in the form of a single flat spirally wound layer (applied particularly to copper water tube or refrigerator service tube. Also known as Pancake Coil or Single Layer Spirally Wound Coil).

Coining / Frappe

A process of impressing images or characters from a die onto plain metal surfaces.

Cold Forging / Forgeage à froid (See Forging)**Cold Heading / Matricage à froid**

A fabrication method in which a blank is held in a stationary die and struck by a moving die, the manufacture of nails being one example.

Cold Pressure Welding / Soudage par déformantion à froid (See Welding)**Cold Rolled Finish / Fini laminé à froid (See Finish)****Cold Rolling / Laminage à froid (See Rolling)****Cold Shortness / Cassant à froid**

The characteristic of metals that are brittle at temperatures below the recommended hot working temperature ranges.

Cold Shut / Reprise

1. A discontinuity that appears on the surface of cast metal as a result of two streams of liquid metal meeting and failing to unite.
2. On a forging, a portion of the surface that is separated by oxide from the main body of the metal.

Cold side / Matriage à température insuffisante

As applied to forging, the temperature range below the optimum hot working temperature.

Cold Working / Déformation à froid

The process of changing the form of cross-section of a piece of metal at a temperature below the softening or recrystallization point, but commonly at or about room temperature. Includes rolling, drawing, pressing and stretching.

Collapsing Pressure / Pression d'écrasement

The external hydrostatic or pneumatic pressure required to collapse a tube or other hollow article.

COLOURING / COLORATION*Chemical Colouring / Coloration chimique*

Process of imparting to a metal surface a colour other than its natural one by chemical means.

Mechanical Colouring / Coloration mécanique

A light final buffing operation using a crocus or lime composition or grease compound on a soft cloth wheel after the article has been cut down or plated. Sometimes called Glossing.

Commercial Bronze / Laiton rouge 90-10 (See Copper Alloy)**Commutator Segment Stock Bar / Lames de collecteurs**

A bar for use in the making of commutators of electric motors and generators, the cross-section of the bar being a trapezoid or truncated sector or segment of a circle.

Compound Bunch / Torsade composée

A number of bunches twisted together in the same direction and in a uniform manner.

Compound Strand / Toron composé

A number of simple strands twisted together so that each simple strand, with the exception of the centre one, has a helical form of pre-determined lay ratio. When the number of simple strands exceeds four they are arranged in concentric layers. Alternate layers are usually laid in opposite directions.

Compound Stranded Bunch / Torsade câblée composée

A number of stranded bunches twisted together so that each stranded bunch, with the exception of the centre one, has a helical form of pre-determined lay ratio. When the number of stranded bunches exceeds four they are arranged in concentric layers. Alternate layers are usually stranded in opposite directions.

Compressed Strand / Toron comprimé

A strand which has been consolidated and shaped by rolling or otherwise into a required section.

Concentration Cell Reaction / Pile de concentration

A localized corrosion process electrochemical in character, due to differences in electrical potential between surface areas where a difference exists in the concentration of ions in the medium in contact with the metal surface.

Concentricity / Concentricité (See Tube Measurement Terms)**Condenser Tube / Tube de condenseur (See Tube, Heat Exchanger Tube)****Condenser Tube Plate / Plaque tubulaire**

Plate manufactured to special thickness tolerances and furnished in various contours as tube sheets or head plates in condensers and heat exchangers.

Condition—Hard, Soft / État—Dur, Mou

General term for temper, hard being the as-worked temper, and soft being the annealed temper.

Continuous Annealing / Recuit de passage (See Annealing)**Continuous Casting / Coulée continue (See Casting)****Continuous Strip Annealing / Recuit continu en bandes**

Thermal treatment (annealing) of strip in which the strip travels through the annealing equipment in a continuous length under controlled conditions and speed.

Converter / Convertisseur

A large, cylindrical steel vessel lined with refractory material and equipped with a number of air inlets, or tuyeres, in which air under pressure is passed through molten copper matte to remove iron, sulphur, and certain other impurities to produce blister copper.

Converting / Convertissage

Smelting operation in which iron, sulphur, and certain other impurities, are removed from molten copper matte to produce blister copper.

COPPER / CUIVRE

Coppers / Cuivres

Metals which have a minimum copper content of 99.3%.

Arsenical Tough Pitch Copper / Cuivre à l'arsenic, non désoxydé

Copper No. 141. A modified tough pitch copper containing substantial amounts of arsenic regardless of origin or treatment.

Blister Copper / Cuivre « Blister »

Copper of 99% or more purity produced in the converting operation, with the surface of the metal having a rough or blistered appearance when in solid form.

Cadmium Copper / Cuivre au cadmium

Copper Nos. 162, 164 and 165, containing cadmium as the principal alloying element normally in the range of 0.6 to 1.2%, with or without minor additions of other elements.

Cathode Copper / Cathode en cuivre

A commercially pure copper electrolytically refined in cathode form.

Chromium Copper / Cuivre au chrome

Copper Nos. 182, 184 and 185, containing chromium as the principal alloying element, normally in the range of 0.4 to 1.2%, with or without minor additions of other elements.

Coalesced Copper / Cuivre coalescé

A commercially pure oxygen-free copper formed in a protective atmosphere at elevated temperature but below its melting point by application of mechanical pressure to particles of electrolytic cathode copper.

Electrolytic Tough Pitch Copper / Cuivre électrolytique, non désoxydé

Copper No. 110. A commercially pure high conductivity copper of any origin which has been refined by electrolytic deposition, then melted, oxidized and brought to tough pitch or controlled low oxygen content, and finally cast into cakes, billets wire bars, etc., suitable for hot or cold working, or both.

Fire Refined Copper / Cuivre affiné au feu

A commercially pure copper of any origin or type which is finished by furnace refining without at any stage having been electrolytically refined.

High-Conductivity Copper / Cuivre à haute conductivité

Copper Nos. 100 to 116 inclusive. A copper which, in the annealed condition, has a minimum electrical conductivity of 100 IACS.

Leaded Copper / Cuivre au plomb

Copper No. 187, containing lead as the principal alloying element, normally in the range of 0.8 to 1.2%

Native Copper / Cuivre natif

Pure copper found in nature in scattered lumps or lattice-like formations.

Oxygen-Free Copper / Cuivre exempt d'oxygène

Copper Nos. 101 and 102. A commercially pure high-conductivity copper which has been produced in such a manner as to contain no oxide or residual deoxidants.

Oxygen-Free Silver Bearing Copper / Cuivre à l'argent, exempt d'oxygène

Copper Nos. 104, 105 and 107. A commercially pure high-conductivity copper containing silver in amounts as agreed upon between the supplier and the consumer for the purpose of raising the softening temperature.

Phosphorus Deoxidized Arsenical Copper / Cuivre à l'arsenic, désoxydé au phosphore

Copper No. 142. A modified deoxidized copper containing arsenic in amounts as agreed upon between the supplier and the consumer mainly for the purpose of increasing corrosion resistance.

Phosphorus Deoxidized Copper / Cuivre désoxydé au phosphore

1. HIGH RESIDUAL PHOSPHORUS, Copper No. 122. A commercially pure copper which has been deoxidized with phosphorus, leaving a relatively high residual phosphorus content.

2. LOW RESIDUAL PHOSPHORUS, Copper No 120. A commercially pure copper which has been deoxidized with phosphorus in such a manner as to leave a very low residual phosphorus content.

Phosphorus Deoxidized Copper, Silver Bearing / Cuivre à l'argent, désoxydé au phosphore

Copper Nos. 121 and 123. A commercially pure deoxidized copper containing silver in amounts agreed upon between the supplier and the consumer.

Phosphorus Deoxidized Copper, Tellurium Bearing / Cuivre au tellure, désoxydé au phosphore

Copper No. 145. A modified deoxidized copper containing tellurium in amounts as agreed upon between the supplier and the consumer to improve machinability.

Silver Copper / Cuivre à l'argent

Copper Nos. 104, 105, 107, 113, 114, 115, 116, 121, 123, 127, 128, 129 and 130. Any copper containing substantial amounts of silver, regardless of origin or treatment.

Silver Bearing Tough Pitch Copper / Cuivre à l'argent, non désoxydé

Copper Nos. 113 to 116 inclusive. A commercially pure high conductivity tough pitch copper containing silver in amounts agreed upon between the supplier and the consumer for the purpose of raising the softening temperature.

Sulphur Copper / Cuivre au soufre

Copper No. 147, containing sulphur as the principal alloying element, normally in the range of 0.2 to 0.5%.

Tellurium Copper / Cuivre au tellure

Copper No. 145, containing tellurium as the principal alloying element, normally in the range of 0.4 to 0.6%.

Zirconium Copper / Cuivre au zirconium

Copper No. 150, containing zirconium as the principal alloying element, normally in the range of 0.1 to 0.2%.

COPPER ALLOY / ALLIAGE DE CUIVRE

High Copper Alloys / Alliages à haute teneur en cuivre

Alloys which have a designated copper content in excess of 94%.

Admiralty Brass / Laiton amirauté

Copper Alloy No. 442, containing nominally 71% copper, 28% zinc and 1% tin.

Admiralty, Inhibited / Laiton amirauté inhibé

Copper Alloy Nos. 443, 444 and 445, respectively. Admiralty modified by the addition of .02 to .10% of arsenic, antimony or phosphorus to inhibit dezincification.

Aluminum Brass / Laiton d'aluminium

Copper Alloy No. 687, containing nominally 77.5% copper, 20.5% zinc and 2% aluminum.

Aluminum Bronze / Bronze d'aluminium

Copper Alloy Nos. 606-644 inclusive, containing aluminum as the principal alloying element, normally in the range of 3 to 11%, with or without the additions of other elements.

Architectural Bronze / Bronze architecturale

Copper Alloy No. 385, containing nominally 57% copper, 40% zinc and 3% lead.

Bearing Bronze / Bronze pour coussinets

Copper Alloy Nos. 932 and 934 (cast products), containing tin and lead as the principal alloying elements and with small additions of other elements.

Beryllium Copper / Cuivre au béryllium

Copper Alloy Nos. 170, 172 and 175, containing varying amounts of beryllium and sometimes small amounts of cobalt, nickel and chromium.

Cartridge Brass / Laiton jaune à cartouche

Copper Alloy No. 260, containing nominally 70% copper and 30% zinc.

Commercial Bronze / Laiton rouge 90-10

Copper Alloy No. 220, containing nominally 90% copper and 10% zinc.

Copper-Iron Alloy / Alliage cuivre-fer

Copper Alloy Nos. 192, 193 and 194, containing iron as the principal alloying element with or without the addition of other elements.

Cupro Nickel Alloy / Cupro nickel

Copper Alloy Nos. 700 to 720 inclusive, composed of copper and nickel with nickel content up to 40% and with small additions of elements such as iron and manganese.

Etching Brass / Laiton pour gravure

A term used to indicate quality of material rather than chemical composition. The term signifies a flat product having unusual freedom from surface defects; very flat and usually of quarter-hard or half-hard temper.

Extra High Leaded Brass / Laiton au plomb 2.5%

Copper Alloy No. 356, containing nominally 63% copper, 34.5% zinc and 2.5% lead.

Forging Brass / Laiton de matriçage

Copper Alloy No. 377, containing nominally 59% copper, 39% zinc and 2% lead.

Free-Cutting Brass / Laiton de décolletage

Copper Alloy No. 360, containing nominally 61.5% copper, 35.5% zinc and 3% lead.

Free-Cutting Muntz Metal / Métal Muntz de décolletage

Copper Alloy No. 370, containing nominally 60% copper, 39% zinc and 1% lead.

Free-Cutting Phosphor Bronze / Bronze phosphoreux de décolletage

Copper Alloy No. 544, containing nominally 88% copper, 4% tin, 4% zinc and 4% lead.

Gilding Metal / Laiton rouge 95-5

Copper Alloy No. 210, containing nominally 95% copper and 5% zinc.

Gun Metal / Bronze à canon

1. Copper Alloy No. 905 (cast products), containing tin and zinc as the principal alloying elements and small additions of other elements.

2. Copper alloys having combinations of copper, tin, lead and zinc, on which the gun metals are based.

High Leaded Brass / Laiton au plomb 2%

Copper Alloy Nos. 342 and 353, containing nominally for 342, 65% copper, 33% zinc and 2% lead; and for 353, 62% copper 36% zinc and 2% lead.

High Leaded Tube Brass / Laiton au plomb pour tube 1.6%

Copper Alloy No. 332, containing nominally 66% copper, 32.4% zinc and 1.6% lead.

Jewelry Bronze / Laiton pour bijouterie

Copper Alloy No. 226, containing nominally 87.5% copper and 12.5% zinc.

Leaded Commercial Bronze / Laiton rouge 90-10 au plomb

Copper Alloy No. 314, containing nominally 89% copper, 9.25% zinc and 1.75% lead.

Leaded Muntz Metal / Métal Muntz au plomb

Copper Alloy No. 365, containing nominally 60% copper, 39.4% zinc and 0.6% lead.

Leaded Naval Brass / Laiton naval au plomb

Copper Alloy No. 485, containing nominally 60% copper, 37.5% zinc, 1.75% lead and 0.75% tin.

Leaded Red Brass / Laiton rouge 85-15 au plomb

Copper Alloy No. 320, containing nominally 85% copper, 13% zinc and 2% lead.

Leaded Tin Bronze / Bronze à l'étain au plomb

Copper Alloy Nos. 922 to 945 (cast products) inclusive, containing tin and lead as the principal alloying elements.

Low Brass / Tombac 80-20

Copper Alloy No. 240, containing nominally 80% copper and 20% zinc.

Low Leaded Brass / Laiton au plomb 0.5%

Copper Alloy No. 335, containing nominally 65% copper, 34.5% zinc and 0.5% lead.

Low Leaded Tube Brass / Laiton au plomb pour tube 0.5%

Copper Alloy No. 330, containing nominally 66% copper, 33.5% zinc and 0.5% lead.

Manganese Bronze / Bronze au manganèse

Copper Alloy No. 675, containing nominally 58.5% copper, 39% zinc, 1.4% iron, 1% tin and 0.1% manganese.

Medium Leaded Brass / Laiton au plomb 1%

Copper Alloy No. 340, containing nominally 65% copper, 34% zinc and 1% lead.

Muntz Metal / Métal Muntz 60-40

Copper Alloy No. 280, containing nominally 60% copper and 40% zinc.

Naval Brass / Laiton naval

Copper Alloy No. 464, containing nominally 60% copper, 39.25% zinc and 0.75% tin.

Nickel Silver Alloys / Maillechorts

Copper Alloy Nos. 730-779 inclusive, containing nickel and zinc as the principal alloying elements, normally in the range of 10 to 18% nickel and 17 to 27% zinc.

Ounce Metal / Métal pour robinetterie

Copper Alloy no. 836 (cast products), containing nominally 85% copper, 5% tin, 5% lead and 5% zinc. It derived its name from an old alloy which was made up of 1 lb. copper, 1 oz. tin, 1 oz. lead and 1 oz. zinc.

Phosphor Bronze / Bronze phosphoreux

Copper Alloy Nos. 500-549 inclusive, containing tin as the principal alloying element, normally in the range of 1.25 to 10% tin, and deoxidized with phosphorus.

Radiator Core Brass / Radiateurs, Bande de laiton pour

A term used to indicate strip brass of suitable characteristics for forming radiator cores.

Red Brass / Laiton rouge 85-15

Copper Alloy No. 230, containing nominally 85% copper and 15% zinc.

Silicon Bronze / Bronze au silicium

Copper Alloy Nos. 645-664 inclusive, containing silicon as the main alloying element, normally in the range of 0.5 to 4.0% silicon, and with or without additions of such elements as zinc, manganese, aluminum, iron or nickel.

Tin Bronze / Bronze à l'étain (See Phosphor Bronze)

Yellow Brass / Laiton jaune 65-35

Copper Alloy Nos. 268 and 270, containing nominally 65% copper and 35% zinc.

Copper Cake / Gâteau en cuivre

A cast shape, rectangular in cross-section, for rolling.

Copper Concentrate / Concentré de cuivre

The product of the flotation operation in the extraction of copper from ores, consisting of copper and iron sulphide particles.

Copper Drainage Tube / Tube d'évacuation en cuivre (DWV) (See Tube)

Copper-Iron Alloy / Alliage cuivre-fer (See Copper Alloy)

Copper Matte / Matte de cuivre

A liquid layer of copper and iron sulphides which forms under the liquid slag when smelting copper concentrate in a reverberatory furnace.

Coppermetals / Métaux cuprifères

A general term used in referring to all copper and copper alloys collectively.

Copper Nickel Welding Rod / Baguette de soudage en cupro nickel (See Welding Rod)

Copper Service Tube / Tube de cuivre pour branchements (See Tube)

Copper Water Tube / Tube en cuivre pour l'eau (See Tube)

Copper Welding Rod / Baguette de soudage en cuivre (See Welding Rod)

Cored Forging / Foreage avec noyau (See Forging)

Core-Mold Casting / Coulée avec moule et noyau (See Casting)

CORROSION / CORROSION

Atmospheric Corrosion / Corrosion atmosphérique

Deterioration or discolouration of metal by atmospheric attack.

Dealuminification / Désaluminisation

A phenomenon somewhat similar to dezincification involving loss of aluminum.

Denickelification / Dénickelification

A phenomenon somewhat similar to dezincification involving loss of nickel.

Dezincification / Dézincification

Corrosion of any alloy containing zinc (usually brass) involving loss of zinc.

Erosion / Érosion

The abrasion of metal or other material by liquid or gas usually accelerated by presence of solid particles of matter in suspension, and sometimes by corrosion.

1. *Cavitation / Cavitation*

The damage caused to a material by a moving liquid and associated with the formation and collapse of cavities in the liquid at the solid-liquid interface.

2. *Impingement Attack / Corrosion par érosion*

A type of localized corrosion caused by the striking of a liquid, containing entrained gases, on a metal surface.

Exfoliation Corrosion / Corrosion par exfoliation

Type of corrosion resulting in elevation of layers of metal at the surface.

Fretting Corrosion / Corrosion par frottement

Surface damage in a corrosive media, due to relative movement of solid surfaces in contact under pressure.

Galvanic Corrosion / Corrosion galvanique

Corrosion caused by passage of an electric current between two dissimilar metals in a contacting solution.

Stress Corrosion / Corrosion sous efforts

Spontaneous failure of metals by cracking under combined action of corrosion and stress, residual and applied.

Corrosion Fatigue / Fatigue par corrosion

The deterioration of properties resulting from repeated stressing of a metal in a corrosive medium. The rate of deterioration is greater than that resulting from either repeated stressing or corrosion alone.

Covellite / Covelline

Copper sulphide ore mineral containing 66.4% copper, and a rich blue in colour.

Cracking / Fissure

Rupturing caused mechanically or by thermal contraction or expansion.

Creep / Fluage

The flow or plastic deformation of metals held for long periods of time at stresses lower than the normal yield strength. The effect is particularly important if the temperature of stressing is in the vicinity of the recrystallization temperature of the metal.

See also Tests.

Creep Test / Essai de fluage (See Tests)

Crimped Copper / Cuivre gaufré

Copper in sheets or strips having relatively small transverse corrugations applied subsequent to normal finishing operations to provide for expansion, to increase rigidity or for ornamental purposes.

Cross-linked polyethylene / Polyéthylène réticulé

Thermosetting material derived from chemical cross-linking or vulcanizing of polyethylene at an elevated temperature and pressure so that the long polymer chains of independent molecules are reinforced by cross-linking into the form of a lattice network. Used for insulation of electrical cable.

Cross Rolling / Laminage en travers

Rolling at an angle to the long dimensions of the metal; usually done to increase width.

Crown / Bombage

The variation in thickness across the product from edge to center or edge to edge.

Crucible Melting / Fusion au creuset (See Melting)

Cupping / Emboutissage

A deep drawing operation.

Cup Test / Essai d'emboutissage (See Tests)

Cuprite (Red) / Cuprite (rouge)

Red cuprous oxide ore mineral containing 88.8% copper.

Cupro Nickel Alloy / Cupro nickel (See Copper Alloy)

Cutting / Coupage

1. The procedure of bringing a product to desired dimensions by such operations as slitting, shearing, sawing and blanking.
2. As applied to surface finishing—cutting through or removing the surface layer of a metal with a buffing wheel and suitable abrasive compound usually coarser than that used for buffing. *See buffing.*

Dealuminification / Désaluminisation (See Corrosion)

Deburring / Débavurage

Removing rough or sharp edges left on metal by cutting operations.

Deep Drawing / Emboutissage profond (See Drawing)

Degassing / Dégazage

The removal of gas from molten metal.

Degreasing / Dégraissage

Finishing operation for removal of grease, oil, dirt and other contaminants from metal surfaces by such methods as solvent degreasing, ultrasonic degreasing, and vapour degreasing.

D. & S. Tube / Tube déshumidifié et scellé (See Tube)

Denickelification / Dénickelification (See Corrosion)

Density / Densité

The mass per unit volume of a material or body, usually measured in pounds per cubic inch or grams per cubic centimeter.

Deoxidized / Désoxydé

A term applied to any metal or alloy to indicate that it has been treated to remove oxygen.

Desalination / Dessalage (Dessalement)

A process for converting saline and brackish water to fresh water.

Dezincification / Dészincification (See Corrosion)

Diameter at any Point—inside / Diamètre en un point intérieur quelconque (See Tube Measurement Terms)

Diameter at any Point—Outside / Diamètre en un point extérieur quelconque (See Tube Measurement Terms)

Diameter—Average Inside / Diamètre intérieur moyen (See Tube Measurement Terms)

Diameter—Average Outside / Diamètre extérieur moyen (See Tube Measurement Terms)

Dichromate Dipped Finish / Fini bichromaté (See Finish—Bichromate Dipped Finished)

DIE

1. *In Casting / En fonderie: Moule métallique ou coquille*

The metal mold into which molten metal is forced under considerable pressure to produce a die cast component.

2. *In Forging / En forgeage: Matrice*

Metal blocks having cavities so shaped as to impart the desired shape to the metal being forged when the dies (or blocks) are brought together in the forging press.

3. *In Drawing / Dans l'étirage: Filière*

The metal tools through which rod, wire or tube are pulled to reduce them to desired size.

Die Casting / Coulée sous pression (See Casting)

Die Life / Durée du moule

The satisfactory service period of dies before they become worn and must be removed from production equipment.

Dye Penetrant Test / Essai par ressuage (See Test)

Die Scalping (Die Shaving) / Écrotage par matrice

Drawing through a sharp edged die to remove the surface layer.

Die Scratch / Rayure

A longitudinal scratch on the surface of any drawn product resulting from the use of a roughened die or from the drag of a foreign particle between die and product.

Diffusion Brazing / Brasage par diffusion (See Brazing)

Dimensional Tolerances / Tolérances sur les dimensions

The amounts by which dimensions may vary from that specified.

Dip Soldering / Soudage par trempage (See Soldering)

Dip Solution / Bain de finition

Any chemical solution used to produce a specific color or finish on copper or copper alloys.

Directional Solidification / Solidification directionnelle

Solidification of molten metal in a casting in such a manner that feed metal is continually available for that portion that is just solidifying, such as in continuous casting.

Disc-Type Straightening / Redressage à la machine (See Straightening—Ring-Type)

Dish / Tullage

The transverse departure of the concave surface from a straight line from edge to edge.

Double Layer Flat Coil / Couronne à double hélice à plat (See Coil)

Draft Angle / Angle de dégagement

Angle or taper on the die or pattern surface, that facilitates the removal of parts from a die or a mold.

DRAWING / 1. Étirage 2. Emboutissage

1. The process of pulling flat products, rod, wire, tube, shapes, etc., through a die. This effects a reduction in size or change in shape of the cross-section and hardens the metal.

2. The process of making articles in a press from blanks cut from flat products in which the gauge is reduced by pushing the metal between a punch and die to develop the side walls of the part.

Deep Drawing / Emboutissage profond

Forming of a hollow component with deeply recessed parts, by forcing a blank into and/or through a die.

Plug Drawing / Étirage avec poinçon

Refers to tube drawing for size reduction wherein the plug is inserted in the tube and the tube drawn through a die and over the plug.

Drawn Finish / Fini étiré (See Finish)

Drawn Temper / État étiré (See Temper)

Drop-Hammer Forming / Formage au marteau-pilon (See Forming)

Dross / Scorie ou Crasse

Oxides of metals and other impurities on the molten metal surface.

Dry Rolled Finish / Fini laminé à sec (See Finish)

Ductility / Ductilité

The property of a metal that permits permanent deformation before fracture by stress in tension.

Duplex Tube / Tube bimétallique (See Tube, Bimetal)

Ears / Cornes d'emboutissage

Wavy projections in a regular geometric pattern on the rim of drawn cups formed in the course of deep drawing, as a result of directional properties or anisotropy of the sheet metal.

Eccentricity / Excentricité (See Tube Measurement Terms)

Eddy Current Test / Essai par courants de Foucault (See Tests)

Edgewise Curvature / Courbure

The lateral curvature of the edge from a straight line, which may be unidirectional or reversing.

Electric Induction Furnace / Four électrique à induction

An electric melting furnace in which the primary conductor is coiled and generates, by electromagnetic induction, a secondary current which develops heat within the metal charge in the furnace.

Electric Resistance Welding / Soudure par résistance électrique (See Welding)

Electrocoating / Revêtement électrolytique

Process whereby metal is deposited from an electrolytic bath on an object serving as a cathode.

Electro-Deposition / Dépôt électrolytique

The deposition of a metal or alloy on an electrode by passing electric current through an electrolyte (electrolysis).

Electro-Formed Waveguides / Guides d'ondes formés par électrolyse

Hollow metal tubes used for the transmission of electrical energy, and produced by electrodeposition of metal on a removable form or mandrel.

Electroforming / Électroformage

Manufacture of articles by electro-deposition of a metal or alloy on a removable form or mandrel of the desired shape.

Electrolytic Tanks / Cuves électrolytiques

Vessels or cells in which electro-deposition is done.

Electrolytic Tough Pitch Copper / Cuivre électrolytique, non désoxydé (See Copper)

Electron-Beam Welding / Soudage par bombardement électronique (See Welding)

Electroplating / Galvanoplastie (See Electrocoating)

Electropolishing / Polissage électrolytique

An electrochemical surface finish obtained by preferential dissolution of metal at the anode.

Elongation / Allongement

The permanent extension of a specimen which has been stretched to rupture in a tension test. The percentage elongation is an indication of ductility. *See Test, Tension.*

Embossing / Repoussage

The ornamenting of metalwork with raised surfaces.

Embrittlement / Fragilisation

Loss in ductility of metal caused by physical or chemical change.

Enamelled Copper Wire / Fil de cuivre émaillé

Copper conductor insulated with a coating of enamel.

Enamelling, vitreous / Emaillage vitreux

Coating by thermal treatment, of a low melting point glass, compounded from a variety of chemicals such as feldspar, silica, borax and so forth.

Enargite / Enargite

Ore mineral containing 48.3% copper and sulphur and arsenic.

Endurance Test / Essai de fatigue (See Tests)

Equivalent Round / Section circulaire équivalente

The equivalent round of a tube other than round is the circular tube which has the same wall thickness as the average wall thickness of the tube under consideration and the same weight per linear foot.

Erosion / Érosion (See Corrosion)

Etching (an Etching) / Une gravure

In metallurgy, a specimen that has been subjected to preferential chemical or electrolytic attack in order to reveal structural details.

Etching (to Etch) / Gravage

1. As applied to mill products and forgings, an attack by corrosive media resulting in pitting, mealiness or outline of structural details of the metal.
2. In metallography, the process of revealing structural details by the preferential attack of reagents on a metal surface.

Etching Brass / Laiton pour gravure (See Copper Alloy)

Exfoliation Corrosion / Corrosion par exfoliation (See Corrosion)

Expanded Polyethylene / Polyéthylène spongieux

Polyethylene with a relatively low density produced by the addition of small unicellular air or gas bubbles.

Expansion Test / Essai d'évasement (See Tests)

Explosive Forming / Formage par explosion (See Forming)

Extra High Leaded Brass / Laiton au plomb 2.5% (See Copper Alloy)

Extruded Bar / Barre filée

Extruded Rod / Tige filée

Extruded Shape / Profilé filé

Extruded Tube / Tube filé

Extruded Wire / Fil extrudé

Stock brought to final dimensions by extrusion. *Also see As Extruded.*

Extrusion, Hot / Filage à chaud

The process of shaping metal into a chosen continuous form by forcing it from a closed container through a die of appropriate shape. *See As Extruded.*

Fatigue / Fatigue

The tendency for a metal to break under conditions of repeated cyclic stressing considerably below the ultimate tensile strength.

Fatigue Test / Essai de fatigue (See Tests—Endurance Test)

Ferrule / Ferrule

Metal ring or collar used in installation of boiler flues, condenser tubes and similar applications.

Filler Metal / Métal d'apport

A metal or alloy which is melted down in a welding or brazing operation to supply metal for the joint.

Filtering / Filtrage

In ore processing, filtering is the process which follows flotation.

FINISH / FINI

Acid Dipped-Dry Rolled Finish / Décapé et laminé à sec

The finish obtained by cold dry rolling on polished rolls of material previously bichromate dipped or bright dipped, giving a burnished appearance and retaining the color obtained by dipping.

Bichromate Dipped Finish / Fini bichromaté

A semi-matte finish approaching the true color of the metal, obtained by immersion in an aqueous solution of sodium bichromate and sulfuric acid to remove scale and oxide.

Bright Annealed Finish / Fini recuit brillant

The finish obtained by annealing under conditions of controlled atmosphere to prevent oxidation and to retain the original luster of the product.

Bright Dipped Finish / Fini brillanté

A bright finish having the true color of the metal obtained by immersion in an aqueous solution of sulfuric acid and nitric acid.

Brush Brass Finish / Fini brossé

A frosted finish obtained on brass by brushing with a Tampico (Bristol brush) wheel treated with brush rouge and rotating at high speeds.

Buffed Surface Finish / Fini bufflé

The finish obtained by buffing with rouge or similar fine abrasive, resulting in a high gloss or finish.

Cold Rolled Finish / Fini laminé à froid

The finish obtained by cold rolling of plain pickled strip with a lubricant; giving a relatively smooth appearance.

Dichromate Dipped Finish / Fini bichromaté (See Bichromate Dipped Finish)

Drawn Finish / Fini étiré

The finish obtained on tube, wire, and drawn rod, bar and strip by drawing through a die.

Dry Rolled Finish / Fini laminé à sec

1. The finish obtained by cold rolling on polished rolls without the use of any coolant or metal lubricant, on material previously plain pickled, bichromate or bright dipped.

2. The finish obtained by the rolling or tumbling of brass articles in a barrel with either dry sawdust, leather or scrap cork.

Finish Annealing / Recuit de finition (See Annealing)

Hot Rolled Finish / Brut de laminage à chaud

The finish obtained by rolling metal while hot.

Plain Extruded Finish / Fini de filage

The finish obtained on tube, wire rod, bar, strip and sections, by extrusion through a die.

Plain Pickled Finish / Brut de décapage

The finish obtained by immersion in a sulfuric acid solution.

Planish Finish / Fini plané

A bright smooth finish usually obtained by rubbing metals together.

Scratch Brushed Finish / Fini satiné

The finish obtained by mechanically brushing the surface with wire bristle brushes or by buffing.

Finished Edges / Rives travaillées

Smooth edges produced on flat wire, strip or bar by drawing or rolling with or without previous slitting. The edge contours most commonly used are Square Corners, Rounded Corners, Rounded Edges and Full Rounded Edges.

Finned Tube / Tube à ailettes (See Tube)

Fire Refined Copper / Cuivre affiné au feu (See Copper)

Fixed-Type Cleats / Pattes fixes

Fastening devices for fixing sheet copper roofing to a substrate, and which acts as anchors and do not allow longitudinal movement due to expansion and contraction of the metal.

Flanging / Rabattage

Forming a projection, usually on the end of a tube, to increase its strength.

Flaring / Évasement

1. Forming an outward acute-angle flange on a tubular part.
2. Forming a flange by using the head of a hydraulic press.

Flaring Test / Essai d'évasement (See Tests—Expansion Test)

Flashing (Copper) / Noues en cuivre ou Solins en cuivre

Sheet or strip copper used to give a weather-tight joint, at such places as where a roofslope meets a vertical wall, or where two roofslopes meet, or to protect building structural materials from the elements.

Flatness / Planéité

The degree to which a surface of a flat product approaches a plane.

Flat Product: Drawn Flat; Rolled Flat / Produit plat: étiré plat; laminé plat

A product with rectangular or square solid section and relatively great length in proportion to thickness. DRAWN FLAT—brought to final dimensions by drawing through a die. ROLLED FLAT—brought to final thickness by rolling.

Flattening / Aplanissement

The mill operation performed on rolled flat products to reduce departure from flatness, such as curl and dish.

Flattening Test / Essai d'aplatissement (See Tests)

Flotation / Flottation (Flottage)

Concentrating operation in which available metallic minerals are separated from the waste rock of finely ground ores, by the principle of different minerals having different wetting characteristics, to produce copper concentrate.

Flow Lines / Veines

Deformation of the crystal structure revealed on a polished and etched section which discloses the manner in which the metal is made to fill and follow a die contour.

Fluidity / Fluidité

The ability of molten metal to run into and fill a mold cavity.

Fluted Outside & Plain Inside Tube / Tube à cannelures extérieures (See Tube)

Fluted Tube / Tube à cannelures (See Tube)

Flux / Flux

1. In melting, a substance added to the melt to promote removal of foreign materials, and protect the surface.
2. In brazing or welding, a substance introduced to remove oxide and impurities.

Foil / Feuillard

A term often applied to a thin flat rolled section usually .005 in. or less in thickness.

FORGING

1. A Forging: / Pièce forgée

An article produced by the forging process.

2. To Forge: / Forgeage

A method of forming parts by pressing a heated slug or blank cut from wrought material in an impression die.

Closed-Die Forging / Forgeage en matrice fermée

Shaping of metal completely within the cavities of the dies that enclose the metal when brought together.

Cold Forging / Forgeage à froid

Forging of metal heated below its recrystallization temperature.

Cored Forging / Forgeage avec noyau

Forging process used in the manufacture of complex parts.

Hammer Forging / Forgeage au marteau-pilon

A forging process in the piece is deformed by repeated blows.

Open-Die Forging / Forgeage avec matrice ouverte

Forging process wherein the workpiece is not completely surrounded by the dies.

Forging Brass / Laiton de matriçage (See Copper Alloy)**Forging Range / Limites de forgeage**

Temperature range within which the slug or blank cut from wrought material should be heated to give optimum forging conditions.

FORMING / FORMAGE

Shaping of metal part without intentionally changing its thickness.

Drop-Hammer Forming / Formage au marteau-pilon

Forming operation using a drop-hammer for force.

Explosive Forming / Formage par explosion

Shaping of metal in dies, using explosive charge to create the forming pressure.

Roll Forming / Formage par rouleaux

Forming of metal using power-driven rolls, the contour of the rolls determining the final shape of the product.

Freezing Range / Intervalle de solidification

The range of temperature within which a metal solidifies.

Furnace / Four

A chamber, apparatus or equipment in which fuel is consumed to produce heat for various purposes.

Free Machining / Facilement usinable

The quality of an alloy which enables it to be cut in automatic machines at relatively high speeds yielding a short brittle chip.

Free-Cutting Brass / Laiton de décolletage (See Copper Alloy)**Free-Cutting Muntz Metal / Métal Muntz de décolletage (See Copper Alloy)****Free-Cutting Phosphor Bronze / Bronze phosphoreux de décolletage (See Copper Alloy)****Fretting Corrosion / Corrosion par frottement (See Corrosion)****Fusion Welding / Soudage par fusion (See Welding)****Galvanic Corrosion / Corrosion galvanique (See Corrosion)****Gas Shielded Arc Welding / Soudage à l'arc sous gaz protecteur (See Welding)****Gassing / Gazage**

1. A phenomenon in metal caused by absorption of gas while molten and partial evolution as the metal cools, resulting in voids.
2. A condition in oxygen-bearing copper which has been heated to elevated temperatures in a highly reducing atmosphere.

Gas Welding / Soudage au gaz (See Welding)**Gating System / Dispositif d'alimentation**

Usually the assembly of pouring basin risers, sprues and runners in a casting mold.

Gauge / Jauge

An instrument used for measuring physical conditions.

Gauge Number (Thickness) / Numéro de jauge

A number in a specific series used to designate a dimension, this being thickness of flat products, wall thickness of tube or diameter of wire.

General Purpose Temper / État étiré pour applications générales (See Temper)**Gilding Metal / Laiton rouge 95-5 (See Copper Alloy)****Grain / Grain**

A solid polyhedral (or many sided) crystal consisting of groups of atoms bound together in a regular geometric pattern. In mill practice grains are usually studied only as they appear in one plane.

Grain Boundary / Interface cristalline

The line of demarcation between grains.

Grain Growth / Croissance du grain

The process by which individual grains coalesce to form larger and, therefore, fewer grains. This is usually brought about by annealing and results in the softening of the metal as well as changes in other properties.

Grain Size / Dimension du grain

The average diameter of grains, usually determined microscopically, on an etched surface of the metal.

Gravity Die Casting / Coulée par gravité en moule métallique (See Casting)**Grinding / Meulage**

Removing material from work with an abrasive wheel.

Gun Metal / Bronze à canon (See Copper Alloy)

Hammer Forging / Forgeage au marteau-pilon (See Forging)

Hand Straightening / Redressage manuel (See Straightening)

Hard-Drawn Temper / État étiré dur (See Temper)

Hardness / Dureté

The resistance of metal to plastic deformation by indentation. The most common method of measurement is Rockwell. Other methods are Brinell, Scleroscope, Tukon and Vickers.

Hardness Number / Indice de dureté

The number used to designate the hardness of metal. The number is related to the scale of values of a particular hardness test, as Rockwell B 80 or Brinell 150.

Hard Spot / Point dur

Localized dense inclusions in a casting, harder than the surrounding metal.

Heat Cracking / Crique à chaud

Spontaneous failure of some metals by cracking under combined action of elevated temperature and stress (residual or applied). Fire cracking is a form of heat cracking resulting from residual stress and externally applied heat.

Heat Exchanger / Échangeur thermique

A chamber or conduit in which heat resulting directly from combustion of fuel or electrical resistance or heat from a heating medium such as air, water or steam is transferred through the walls of the chamber or conduit to the surrounding air and surrounding objects, or to the surrounding water.

Heat Exchanger Tube / Tube pour échangeur (See Tube)

Heat Treatment / Traitement thermique

A combination of heating and cooling operations applied to a metal or alloy in the solid state to produce changes in physical and mechanical properties.

Helical Coil / Couronne hélicoïdale (See Coil)

High-Conductivity Copper / Cuivre à haute conductivité (See Copper)

High Copper Alloys / Alliages à haute teneur en cuivre (See Copper Alloy)

High-Frequency Welding / Soudage à haute fréquence (See Welding)

High Lead Brass / Laiton au plomb 2% (See Copper Alloy)

High Lead Tube Brass / Laiton au plomb pour tube 1.6% (See Copper Alloy)

Holding Furnace / Four d'attente; Four de maintien

A small furnace into which molten metal can be transferred to be held at the proper temperature until it can be used to make castings.

Homogeneous / Homogène

The same in structure or quality, similar, or composed of similar parts.

Homogenization (Annealing) / Homogénéisation (recuit)

Elimination or reduction of chemical segregation by diffusion, by holding the metal at elevated temperature.

Honing / Alésage

Removal of internal stock from cylindrical surface of a workpiece by abrasion.

Hot Rolled Bar / Barre laminée à chaud

Hot Rolled Plate / Plaque laminée à chaud

Hot Rolled Rod / Tige laminée à chaud

Hot Rolled Shape / Profilé laminé à chaud

Hot Rolled Sheet / Feuille laminée à chaud

Hot Rolled Wire / Fil laminé à chaud

Stock brought to final dimensions by hot rolling.

Hot Rolled Finish / Brut de laminage à chaud (See Finish)

Hot Rolling / Laminage à chaud (See Rolling)

Hot Shortness / Cassant à chaud

Brittleness in hot metal.

Hot Spot / Point chaud

Localized area of high temperature resulting from inadequate heat dissipation by the mold.

Hot Working / Déformation à chaud

The process of changing the form or cross-section of a piece of metal at a temperature above its recrystallization temperature.

Hydroforming (original term Hydroform) / Hydroformage

Forming of metal parts by application of hydraulic pressure.

Hydrogen Embrittlement / Fragilisation par hydrogène

In oxygen-bearing copper, a condition of low ductility resulting from absorption of hydrogen at high temperature, internal reduction of cuprous oxide and creation of intergranular holes or cracks by the accompanying generation of steam.

Hydronic Heating System / Système de chauffage hydronique

A hot water heating system using forced re-circulation of hot water through baseboard convectors.

Hydrostatic Test / Essai sous pression hydraulique (See Tests)**Impact Extrusion / Filage par choc**

The formation of a tubular closure by the rapid application of force through a punch on a metal blank, the metal flowing up around the punch to form a tubular section. Also known as Hooker Process.

Impact Resistance, Shock Resistance / Résilience

The resistance of a metal to failure due to sudden shock load.

Impact Test / Essai de résilience (See Tests)**Impingement Attack / Corrosion par érosion (See Corrosion—Erosion)****Inclined Roll Straightening / Redressage par rouleaux obliques (See Straightening)****Inclusion / Inclusion**

Particles of foreign material (usually chips, dirt, carbon, oxides) that are held mechanically on or within the metal.

Induction Annealing / Recuit par induction (See Annealing)**Induction Melting / Fusion par induction (See Melting)****Industrial Service Tube / Tube à usage industriel (See Tube)****Industry Alloy No. / Code d'alliage**

The standard copper industry designation given to a coppermetal of a particular composition.

Ingot / Lingot

A copper or copper-alloy casting of small rectangular shape weighing about 20-35 pounds for remelting.

Ingot Bar / Lingot

A small rectangular copper casting weighing about 50-70 pounds for remelting.

Inhibitor / Inhibiteur

Elements added in small amounts to alloys to increase the resistance of the alloys to corrosion.

Intercrystalline (Intergranular) / Intercristallin(e) (Intergranulaire)

Terms used interchangeably to indicate a path along the grain boundaries and between the crystals or grains rather than through the grains.

Intercrystalline Cracking (Intergranular Cracking) / Crique intercristallin(e) (Crique intergranulaire)

Fracture of metal that follows along the grain boundaries and between crystals or grains.

Investment Casting / Moulage en cire perdue (See Casting)**Jewelry Bronze / Laiton pour bijouterie (See Copper Alloy)****“Keyhole” Effect / Effet de « trou de serrure »**

The main feature of the plasma arc welding process, whereby the arc makes a hole through the metal which moves along behind the joint as welding proceeds.

Knurling / Molettage

Producing a surface design by passing the metal between hard rollers with corresponding design on their surface.

Lacquering / Laquage

Application of quick-drying surface coating, containing natural or synthetic substances.

Lap / Repli

A surface defect appearing as a seam, caused by folding over hot metal, fins or sharp corners and then rolling or forging, but not welding, them into the surface.

Lay Ratio / Pas

The ratio of the axial length of a complete turn of the helix formed by the wire of a stranded conductor to the mean diameter of the helix.

Leaching / Lixiviation

Recovery of a soluble material from a heterogeneous solid by dissolution in a suitable liquid.

Leaded Commercial Bronze / Laiton rouge 90-10 au plomb (See Copper Alloy)

Leaded Copper / Cuivre au plomb (See Copper)

Leaded Muntz Metal / Métal Muntz au plomb (See Copper Alloy)

Leaded Naval Brass / Laiton naval au plomb (See Copper Alloy)

Leaded Red Brass / Laiton rouge 85-15 au plomb (See Copper Alloy)

Leaded Tin Bronze / Bronze à l'étain au plomb (See Copper Alloy)

LENGTHS / LONGUEURS

Mill Lengths / Longueurs courantes

Certain uniform lengths subject to established tolerances with short lengths included according to established schedule.

Multiple Lengths / Longueurs multiples

Lengths of integral multiples of a base length with suitable allowance for cutting if and as specified.

Random Lengths / Longueurs tout-venant

Run-of-mill lengths without any indicated preferred length.

Specific Lengths / Longueurs à la demande

Indicated uniform lengths, subject to established length tolerances.

Specific Lengths with Ends / Longueurs à la demande avec leurs chutes

Indicated uniform lengths of 6 feet or over subject to established length tolerances and with ends included according to established length schedules; for example: 10'-0" with ends or 6'-5" with ends.

Standard Lengths / Longueurs normalisées

Lengths which have been recommended as standard lengths for certain products.

Stock Lengths / Longueurs en magasin

Normally certain uniform lengths subject to established tolerances (including Standard Lengths) actually carried in mill and warehouse stock.

Light-Drawn Temper / État légèrement étiré (See Temper)

Lock Seam Tube / Tube agrafé (See Tube)

Low Brass / Tombac 80-20 (See Copper Alloy)

Low Fuming Welding Rod / Baguette de soudage pour soudo-brasage (See Welding Rod)

Low-Leaded Brass / Laiton au plomb 0.5% (See Copper Alloy)

Low Leaded Tube Brass / Laiton au plomb pour tube 0.5% (See Copper Alloy)

Machinability Rating / Indice d'usinabilité

A relative measure of the machinability under specific standard conditions.

Machining / Usinage

Removal of material in the form of borings or chips using mechanical means.

Malachite / Malachite

Oxidized ore mineral containing 57.4% copper, and bright green in colour.

Malleability / Malléabilité

The property of a metal that permits deformation by rolling, heading, hammering or extension by pressure without fracturing.

Manganese Bronze / Bronze au manganèse (See Copper Alloy)

Manganese Bronze Welding Rod / Baguette de soudage en bronze manganèse (See Welding Rod)

Mannesmann Process / Procédé de Mannesmann

The process of piercing heated solid billets to form seamless tubes.

Master Alloy Hardener / Alliage mère, durcisseur

An alloy of composition high in one or more elements, that is added to a melt to increase the amount of the desired element.

Mechanical Colouring / Coloration mécanique (See Colouring)

Mechanical Properties / Propriétés mécaniques

The properties of a material such as modulus of elasticity, tensile strength, elongation, hardness, and fatigue limit.

Mechanical Stitcher / Agrafeuse

A machine which fastens the end of a roll of strip to the start of the next roll to permit continuous operation.

Medium Leaded Brass / Laiton au plomb 1% (See Copper Alloy)

Melt / Fonte (Une)

The total charge of metal in a furnace for carrying out a casting process.

MELTING / FUSION

Arc Melting / Fusion à l'arc

A melting operation wherein the heat is supplied by electric arc.

Crucible Melting / Fusion au creuset

Melting of metal in a refractory pot.

Induction Melting / Fusion par induction

Melting operation wherein the heat is generated by electro-magnetic induction.

Melting Point / Point de fusion

The temperature at which a pure metal, compound or eutectic changes from solid to liquid; the temperature at which the liquid and the solid are in equilibrium.

Metal Core Mercurous Nitrate Test / Essai au nitrate mercurieux (See Tests)**Metal Core / Noyau métallique**

A specially formed metal insert in a mold to shape the interior or other part of the casting which cannot be shaped as easily by the pattern.

Metallizing / Métallisation

Surface deposition of a metallic coating by spraying or in vacuum.

Metal Mold / Moule métallique

A form made of metal which contains a cavity into which molten metal is poured to produce a casting of definite shape and outline.

Metal Shot / Grenaille

Small spherical particles of metal.

Mill Lengths / Longueurs courantes (See Lengths)**Milling / 1. Fraisage 2. Broyage**

1. Removal of material from a workpiece by relative movement of the work piece and a cutter
2. A grinding operation wherein the ore is milled in a ball mill or a rod mill.

MIG Welding / Soudage par procédé MIG (See Welding)**Mining / Exploitation minière**

For mining terminology consult the lexique Anglais-Français de L'Industrie Minière, published by the Office de la Langue Française, Gouvernement du Québec.

Modulus of Elasticity / Module d'élasticité

The ratio of stress to the corresponding strain within the proportional limit of the material.

Mold Dressing, Mold Wash / Enduit pour moule

Usually an aqueous emulsion containing various compounds, used to coat the face of the cavity in the casting mold.

Multiple Lengths / Longueurs multiples (See Lengths)**Muntz Metal / Métal Muntz 60-40 (See Copper Alloy)****Native Copper / Cuivre natif (See Copper)****Naval Brass / Laiton naval (See Copper Alloy)****Nickel Silver Alloys / Maillechorts (See Copper Alloy)****Nitrogenized Tube / Tube rempli d'azote (See Tube)****Nominal Composition / Composition nominale**

The constituents of an alloy expressed in general percentages without intending exact relationship to a specification.

Non-Destructive Test / Essai non destructif (See Tests)**Non-Oxidizing Atmosphere / Atmosphère non oxydante**

Reducing atmosphere.

Non-Refractory / Non-réfractaire

A term applied to those copper alloys which because of a lack of hardness or abrasiveness, present relatively little difficulty in maintaining standard dimensional tolerances.

Oil Burner Tube / Tube pour brûleur à l'huile (See Tube)**Oil Stain / Tache due à l'huile (See Stains)****Open-Die Forging / Forgeage avec matrice ouverte (See Forging)****Orange Peel Surface / « Peau d'orange » surface**

The surface roughness resulting from working metal of large grain size. The surface is similar in texture to an orange peel.

Ore / Minerai

A natural combination of minerals which usually include metallic elements.

Ore Grinding / Broyage du minerai

The crushing of ore into small pieces, mixing with water and grinding in ball mills.

Ounce Metal / Métal pour robinetterie (See Copper Alloy)**Overhauling / Fraisage (plaque et barre)**

The process of cutting away the surface layer from bars or plates after breakdown rolling. The object of this is to remove the minor surface casting defects and oxide.

Oxidation / Oxydation

A reaction with oxygen resulting in loss of electrons and an increase in the valance of a material.

Oxygen Free Copper / Cuivre exempt d'oxygène (See Copper)

Oxygen-Free, Silver Bearing Copper / Cuivre à l'argent, exempt d'oxygène (See Copper)

Oxy-Acetylene Welding / Soudage oxyacétylénique (See Welding)

Patination (Natural) / Patine (naturelle)

Colouration (normally green) formed on copper and copper alloys by weathering.

Pattern / Modèle

A shape or form in wood, metal or other material, around which molding material is placed to make a mold for the casting of metals.

Pay-Off Reel / Dévidoir

A reel which rotates to unwind a coil of rod, strip, tube, or wire, to commence a process or installation.

Peening / Martelage

Cold-working of metal by hammering or shot blasting.

Permanent Mold Casting / Coulée en moule permanent (See Casting)

Phase / Phase

The physically distinct and homogeneous portion of matter in a heterogeneous system. In alloy systems, phases are usually identified by the Greek letters alpha, beta, etc.

Phosphor Bronze / Bronze phosphoreux (See Copper Alloy)

Phosphorus Deoxidized Copper / Cuivre désoxydé au phosphore (See Copper)

Phosphorus Deoxidized Arsenical Copper / Cuivre à l'arsenic, désoxydé au phosphore (See Copper)

Phosphorus Deoxidized Copper, Silver Bearing / Cuivre à l'argent désoxydé au phosphore (See Copper)

Phosphorus Deoxidized Copper, Tellurium Bearing / Cuivre au tellure, désoxydé au phosphore (See Copper)

Pickle Stain / Tache due au décapage (See Stains)

Pickling / Décapage

The process of removing surface oxide and scale from copper alloys with a mill pickle solution consisting of approximately 12 to 15 per cent sulfuric acid in water.

Piercing / Perçage (See Mannesmann Process)

Pipe / Tuyau

Seamless tube conforming to the particular dimensions commercially known as Standard Pipe Sizes.

Piston Finish Rod / Barres rectifiées (See Rod)

Pit / Piqûre

1. A hole or defect remaining when a foreign particle embedded in the metal surface falls out.
2. A cavity resulting from localized corrosion or over-etching.

Plain Extruded Finish / Fini de filage (See Finish)

Plain Inside & Fluted Outside Tube / Tube à cannelures extérieurs (See Tube—Fluted Outside)

Plain Pickled Finish / Brut de décapage (See Finish)

Planish Finish / Fini plané (See Finish)

Planishing / Planage

A hammering process for producing flat material. This term should not be applied to flat bright material produced by rolling.

Plasma Arc Welding / Soudage à l'arc au plasma (See Welding)

Plate / Plaque

A flat rolled product over 3/16"(.188"), in thickness and over 12" in width.

Plater's Bar / Ébauche plate pour placage

A rectangular section, specially surfaced, for use as a base to which precious metal is to be applied before rerolling, for the jewelry and similar trades.

Plater's Core / Ébauche cylindrique pour placage

A round section, specially surfaced, for use as a base to which precious metal is to be applied before rerolling, for the jewelry and similar trades.

Plating / Plaquage

Deposition of metal on an object.

Plug Drawing / Étirage avec poinçon (See Drawing)

Plug Scratch / Rayure interne d'étirage

A longitudinal scratch on the inside surface of a tube resulting from the use of a roughened plug or the drag of a foreign particle between plug and tube wall.

Pneumatic Test / Essai à l'air comprimé (See Tests)**Pointing / Appointage**

1. The reduction of the diameter of ends of tubes, rod, or wire in order that they may be started through the drawing die.
2. The cutting of a taper point on wire to be made into wood screws and similar products.

Polishing / Polissage

The finishing of metal surfaces by a compound impregnated in the surfaces of a hard fabric faced wheel which rotates at high speed.

Pot Heads / Boîtes d'extrémité

Usually the high voltage connections between overhead wiring and sub-station installations or other ground-mounted equipment.

Pouring Ladle / Poche de coulée

Ladle used for transferring molten metal from the furnace to the mold.

Precision Casting / Coulée de précision (See Casting)**Press Straightening / Redressage à la presse (See Straightening)****Print Roll / Rouleau d'impression**

A tube manufactured with special perfection of surface and straightness, for use in printing paper, linoleum, textiles and similar products.

Printed Circuits / Circuits imprimés

A method of "wiring" electronic components using a layer of copper rather than conventional wiring.

Printed Circuit Board / Panneau de circuit imprimé

A "board" having a printed circuit and on which are mounted the electronic components.

Radiator Core Brass / Radiateurs, Bande de laiton pour (See Copper Alloy)**Rainwater Gutter / Chéneau**

A gutter around the eaves of a building to collect rainwater.

Random Lengths / Longueurs tout-venant (See Lengths)**Ready to Finish / État avant opération finale**

A general mill term applied to size and condition of a product prior to the final drawing or rolling operation.

Recrystallization / Recristallisation

The change in grain structure which occurs when the metal is annealed, during which the deformed grains, strain hardened by working, become new unstrained grains.

Recrystallization Welding / Soudage par recristallisation (See Welding)**Red Brass / Laiton rouge 85-15 (See Copper Alloy)****Red Shortness / Cassant à chaud**

Brittleness in hot metal. Also called Hot Shortness.

Redraw Rod / Barre pour réétirage**Redraw Tube / Tube pour réétirage****Redraw Wire / Fil pour réétirage**

Stock within a limited range of sizes for further drawing or rolling.

Red Stain / Tache rouge (du laiton) (See Stain)**Reduction of Area / Striction**

The decrease in the area of the cross-section of a metal test specimen when fractured in tension testing. It is a criterion of ductility.

Reel: Small; Large / Bobine; Touret

A device on which wire, flat wire, and narrow strip are wound to facilitate handling and shipping.

Refining / Raffinage

The purification of crude or impure metals.

Refining Furnace / Four d'affinage

1. Anode Furnace which is used for melting blister copper and scrap for casting anodes.
2. Cathode Furnace which is used for melting of cathodes and high grade scrap for casting into refining shapes.

Refractory / Réfractaire

A term applied to those copper alloys which, because of their hardness or abrasiveness require dimensional tolerances greater than those established for non-refractory alloys.

Refrigeration Capillary Tube / Tube capillaire de réfrigération (See Tube—Capillary Tube)**Refrigeration Service Tube / Tube de réfrigération (See Tube)****Relative Electrical Conductivity / Conductivité électrique relative**

Relative electrical conductivity of metals, taken at 20°C, and based on Copper = 100.

Relative Thermal Conductivity / Conductivité thermique relative

Relative thermal conductivity of metals, taken at 20°C, and based on Copper = 100.

Residual Stress / Contrainte résiduelle (See Stress)**Resistance Annealing / Recuit par résistance (See Annealing)****Resquared Metal / Métal mis à l'équerre ou Métal affranchi**

Alternately called square-sheared metal. A product furnished in a flat straight length, brought to final width and length by press shearing of both edges and ends. The edges are straighter than those of slit metal, with the ends at right angles to the edges.

Reverberatory Furnace / Four à réverbère

A shallow hearth furnace, with a vaulted roof that deflects flame and heat to the charge.

Rings for Shell Bands / Anneaux pour ceintures d'obus

Tubular blanks manufactured to special tolerances for use as driving bands on gun projectiles.

Ring-Type Straightening / Redressage à la machine (See Straightening)**Rinsing / Rinçage**

The application of a liquid to remove substances from the surface of a metal.

Ripples / Anneaux de broutage

A slight transverse wave or shadow mark repeated at intervals, sometimes observed on flat products.

Risers / Masselottes

Reservoirs of molten metal connected to the casting to provide additional metal to the casting, required as a result of shrinkage before and during solidification.

Riveting / Rivetage

A joining operation using metal rivets.

Roasting / Grillage

Heating an ore to effect some chemical change that will facilitate smelting.

Rockwell Hardness Test / Essai de dureté Rockwell (See Tests)**ROD / BARRE**

Piston Finish Rod / Barres rectifiées

Round rod having a special surface produced by turning or grinding to close tolerances.

Shafting Rod / Barres pour arbres de couche

Round rod specially manufactured to the close straightness tolerances required for use in shafting.

Welding Rod / Baguette pour soudage (See Welding Rod)

Roll / Cylindre ou rouleau

A length of flat rolled product wound into a cylindrical spiral.

Roll Bending / Cintrage par rouleaux (See Bending)**Roll Flattening / Planage par rouleaux**

The process of flattening a product by a machine with a number of small diameter cylindrical rolls so positioned as to repeatedly flex the product and thus remove certain irregularities in shape.

Roll Forming / Formage par rouleaux (See Forming)**Roll Straightening / Redressage par rouleaux (See Straightening)****Roll Threading / Filetage à la molette**

Applying a thread by rolling the piece between grooved die plates, one of which is in motion, or between rotating grooved circular rolls.

ROLLING / LAMINAGE

The process of passing metal between rolls under pressure to reduce its cross-section.

Cold Rolling / Laminage à froid

This process is carried out below the softening point of the metal and, with copper alloys, usually at room temperature.

Hot Rolling / Laminage à chaud

This process is carried out above the softening temperature and, with copper alloys usually at temperatures from about 1200°F to 1700°F (650°C to 927°C).

Rotating Head Straightening / Redressage à la machine (See Straightening)**Runner / Canal de coulée**

1. A channel through which molten metal flows from one receptacle to another.
2. The portion of the gate assembly that connects the downgate or sprue with the casting.

Salt Bath Brazing / Brasage par bain de sel (See Brazing)**Sand Blasting / Sablage**

A cleaning process using a current of air or steam carrying sand at high velocity.

Sand Casting / Coulée en sable (See Casting)

Sand Core / Noyau en sable

A form, specially made in sand, inserted in a mold to shape the interior 1/2 to 3/4 part of the casting which cannot be shaped as easily by the pattern.

Sawed (or Sawn) Bar / Barre sciée

A bar brought to finished width by sawing.

Sawed (or Sawn) Edges / Rives sciées

The edges resulting when a product is brought to final width and length by sawing.

Scratch Brushed Finish / Fini satiné (See Finish)

Sealed or Closed Ends (Tubes) / Bouts scellés (tubes)

Hermetically sealed.

Seamless Tube / Tube sans couture (See Tube)

Season Cracking / Crique saisonnière

Spontaneous failure of some metals by cracking under the combined action of corrosion and residual stresses.

Sectional Tube / Tube profilé (See Tube)

Semi-Continuous Casting / Coulée semi-continue (See Casting)

Semi-Permanent Mold / Coulée en moule semi-permanent

A permanent mold in which sand cores are used.

Semi-Worked Product / Produit semi-ouvré

Products such as rod, sheet, strip, tube and wire, which are subject to further fabrication and installation before serving the ultimate functional purpose.

Shafting Rod / Barres pour arbres de couche (See Rod)

Shape / Forme

A solid section other than rectangular, square or standard rod and wire sections, furnished in straight lengths.

Sheared Edges / Rives fendues

Edges resulting from cutting by guillotine or by rotary shears.

Shearing / Cisailage

Cutting of material between two opposing blades.

Shear Strength / Résistance au cisailage

The stress required to produce fracture in the plane of cross-section.

Sheet / Feuille

A flat rolled product up to and including .188 in. in thickness and over 20 in. in width.

Shell Molding / Moulage en coquille de sable

Method of producing casting molds by bonding sand grains in a smooth-surfaced shell. The shells are formed by bringing the sand and resin mixture into contact with a heated metal pattern. (See Casting—Shell Mold Casting)

Shock Resistance / Résilience (See Impact Resistance)

Silicon Bronze / Bronze au silicium (See Copper Alloy)

Silver Copper / Cuivre à l'argent (See Copper)

Silver Bearing Tough Pitch Copper / Cuivre à l'argent, non désoxydé (See Copper)

Single Layer Flat Coil / Couronne à plat à simple enroulement (See Coil)

Sintering (Powder) / Frittage

Bonding of powder metal particles using heat.

Skimming / Décrassage ou Écrémage

Removal of slag scum and dross from the surface of molten metal.

Skin Temper / État de durcissement superficiel (See Temper)

Slab / Ébauche

A casting in the form of a bar used for rolling into strip.

Sliding-Type Cleats / Pattes coulissantes

Fixing cleats for standing seam copper roofing, designed to permit thermal movement.

Slip / Glissement

Plastic deformation of metals due to relative displacement of crystals in a certain crystallographic direction.

Slit Edges / Rives cisailées

Edges resulting from cutting to width by rotary shears or slitters.

Slitting / Fendage

Cutting to width by rotary cutters.

Slush Casting / Coulée renversée (See Casting)**Smelting / Fusion**

Thermal processing wherein chemical reactions take place to produce liquid metal from a beneficiated ore.

SOLDERING / SOUDAGE TENDRE

Joining metals by fusion of alloys that have relatively low melting points—most commonly, lead-base or tin-base alloys, which are the soft solders.

Dip Soldering / Soudage par trempage

A process wherein the joint to be formed is immersed into a bath of molten solder protected by a layer of molten flux.

Solid Phase Welding / Soudage par phase solide (See Welding)**Sovent Aerator / Aérateur Sovent**

A special fitting used for stack connections in a Sovent self-venting drainage system.

Sovent Deaerator / Désaérateur Sovent

A special fitting used at the base of the stack in a Sovent self-venting drainage system.

Specific Lengths / Longueurs à la demande (See Lengths)**Specific Lengths with ends / Longueurs à la demande avec leurs chutes (See Lengths)****Spill / Soufflure**

A defect which originates during casting and after rolling or drawing appears as a discontinuity either on the surface or as a faint streak which on distortion becomes open or blistered.

Spinning / Repoussage au tour

Shaping of sheet metal parts by the combined forces of rotation and pressure.

Spool / Bobine

A small reel.

Spray Nozzles / Gicleurs d'arrosage

Used for spraying liquid on metals during processing.

Spring Temper / État ressort (See Temper)**Springing / Détente mécanique**

Redistribution of residual stress by mechanical means, as for instance, passing rods through certain types of straightening machines.

Sprue / Descente de coulée

1. The vertical channel that connects the pouring basin with the runner.
2. Sometimes used to mean all gates, risers, runners and similar scrap.
3. Sometimes referred to as "downsprue" or "downgate".

STAINS / TACHES*Air Stain / Ternissement à l'air*

Superficial, uniform light to dark brown discoloration or dulling of the initial luster due to atmospheric attack.

Oil Stain / Tache due à l'huile

Localized brown or black discoloration on the surface of a product caused by incomplete removal or burning of lubricants.

Pickle Stain / Tache due au décapage

Stain resulting from insufficient pickling or inadequate rinsing.

Red Stain / Tache rouge (du laiton)

Pink or reddish surface discoloration usually resulting from volatilization of zinc during annealing or by a copper deposition during pickling.

Water Stain / Tache d'humidité

Localized light-to-dark and often iridescent residue with sharply outlined darker border left from evaporation of water acquired from mill processing, transit or storage.

Stamping / Étampage

A cutting operation using a punch and a die.

Standard Lengths / Longueurs normalisées (See Lengths)**Standing Seam / Joint debout**

A traditional method of eaves to ridge joint in copper roofing.

Starting Sheets / Feuilles de départ

Thin sheets of pure copper which are hung in the tanks, inter-leaved with copper anodes, in the electrolytic refining process.

Stock Lengths / Longueurs en magasin (See Lengths)**Stock Lengths with Ends / Longueurs en magasin avec leurs chutes (See Lengths)****STRAIGHTENING / REDRESSAGE***Hand Straightening / Redressage manuel*

The process of straightening by bending or twisting by hand with the aid of adjustable supports and suitable hand tools usually applied to shapes and to large diameter tubes.

Inclined Roll Straightening / Redressage par rouleaux obliques

The process of straightening round rod or tube by passing the product through a machine with rolls having special contours and whose axes are at a slight angle so as to give the product a helical forward motion with repeated flexing in all planes through the axis.

Press Straightening / Redressage à la presse

The process of straightening bar and large size rod and tube by means of mechanically or hydraulically actuated presses.

Ring-Type or Disc-Type Straightening / Redressage à la machine

The process of straightening rod by rotating while feeding lengthwise through a series of rotating rings or discs which flex the rod in all planes through the axis.

Roll Straightening / Redressage par rouleaux

The process of straightening tube, rod and bar by passing lengthwise through a machine with suitable rolls so as to repeatedly flex the product in two planes at right angles.

Rotating Head Straightening / Redressage à la machine

The process of straightening rod initially produced in a coil, and which comprises the rotation of a series of shaped dies pressed against the rod so as to repeatedly flex the rod in all planes through the axis as it is moved forward through the machine by means of feed rolls.

Stretcher Straightening / Redressage par traction

A process which simultaneously flattens and straightens a product by longitudinally stretching it beyond its elastic limit.

STRESS / TENSION

Applied Stresses / Efforts appliqués, contrainte externe

Stresses that are set up and exist in a body during application of an external load.

Residual Stress / Contrainte résiduelle

Stresses that remain within a body as the result of plastic deformation, casting or rapid temperature change.

Stress Relief Annealing / Recuit de réduction de contraintes

Heating to a suitable temperature, holding long enough to reduce residual stresses and then cooling slowly enough to minimize the development of new residual stresses.

Stranded Bunch / Torsade câblée

A number of bunches twisted together so that each bunch, with the exception of the centre one, has a helical form of pre-determined lay ratio.

Stress Corrosion / Corrosion sous efforts (See Corrosion)

Stretcher Straightening / Redressage par traction (See Straightening)

Strip / Bande

A flat product, other than flat wire, up to and including .188 in. in thickness and generally furnished as follows:

1. With slit, sheared or slit and edged rolled edges in widths up to 20 in. inclusive.
2. With finished drawn or rolled edges in widths over 1¼ in. to 12 in. incl.

Strip-Line Circuits / Circuits sur feuille

A strip-line circuit consists essentially of a plastic baseboard of dielectric material coated with pure copper, and is used in electronic systems.

Sulphur Copper / Cuivre au soufre (See Copper)

Swaging / Retreinte ou Suage

Forming a taper or a reduction on metal products, such as rod or tube, by forging, squeezing or hammering.

Tapping / Taraudage

A thread-cutting operation using a cylindrical or conical tool.

TEMPER / ÉTAT DE LIVRASON

Annealed Temper / État recuit

Temper produced by annealing and usually defined by a nominal grain size or grain size range.

Drawn Temper / État étiré (See General Purpose Temper)

General Purpose Temper / État étiré pour applications générales

Applicable to tube only, commonly used where there is no real requirement for high strength or hardness on the one hand or for bending qualities on the other.

Hard-Drawn Temper / État étiré dur

Used only where there is need for a tube as hard or as strong as is commercially feasible for the size in question.

Light-Drawn Temper / État légèrement étiré

Generally applied to tube where some degree of stiffness is desired without serious impairment of bending qualities.

Skin Temper / État de durcissement superficiel

Temper imparted to the surface of soft copper tube during roll-straightening.

Spring Temper / État ressort

Normally, strip given 8 Brown & Sharpe numbers (or about 60%) reduction in thickness during rolling after the final anneal.

Tellurium Copper / Cuivre au tellure (See Copper)

Tensile Strength / Résistance à la traction

The value obtained by dividing the maximum load observed during tensile straining by the specimen cross-sectional area before straining. Also called "Ultimate Strength".

Tension Test / Essai de traction (See Tests)

TESTS / ESSAIS

Bend Test / Essai de pliage

A test made to indicate ductility or bending quality by bending a suitable specimen about a predetermined radius through a predetermined angle.

Brinell Hardness Test / Essai de dureté Brinell

A test made to determine hardness on relatively thick sections of metal by pressing a steel ball of specified diameter into a test specimen under a specified load.

Creep Test / Essai de fluage

A test to determine the extension of metallic materials due to the combined effects of temperature, tensile stress and time.

Cup Test / Essai d'emboutissage

A test to indicate the ductility of sheet or strip wherein a cup is drawn from the metal until it fractures.

Dye Penetrant Test / Essai par ressuage

Nondestructive test for locating surface defects (cracks, porosity, laminations, etc.) which are revealed by retaining the dye which is applied to the surface of the specimen and the excess then removed.

Eddy-Current Test / Essai par courants de Foucault

Nondestructive test in which eddy-current flow is induced in the test object.

Endurance Test, Fatigue Test / Essai de fatigue

A test to determine the endurance limit of a metal's resistance to fatigue by subjecting a specimen to repeated alternating or pulsating stresses.

Expansion Test, Flaring Test / Essai d'évasement

A test used to determine the capacity of the tube for expansion and to reveal surface defects by pushing a tapered pin into the open end of a specimen.

Fatigue Test / Essai de fatigue (See Endurance Test)

Flaring Test / Essai d'évasement (See Expansion Test)

Flattening Test / Essai d'aplatissement

A test made on annealed tube to indicate ductility and freedom from mechanical defects.

Hydrostatic Test / Essai sous pression hydraulique

A test to prove soundness and resistance to leakage of tube and pipe under internal water pressure.

Impact Test / Essai de résilience

A test made to determine the resistance of metals to failure by sudden shock load.

Mercurous Nitrate Test / Essai au nitrate mercureux

An accelerated test to indicate the resistance of copper-base alloy products to season cracking.

Nondestructive Test / Essai non-destructif

A test that does not destroy the part in determining its suitability for use.

Pneumatic Test / Essai à l'air comprimé

A test used to prove resistance to leakage of tube or pipe by the application of internal air pressure to the product while submerged in water.

Rockwell Hardness Test / Essai de dureté Rockwell

A test to measure hardness by determining the depth of penetration into a specimen of a penetrator under predetermined conditions of test.

Tension Test / Essai de traction

A test to determine one or more of the following: tensile strength, yield strength, elongation and reduction of area.

Torsion Test / Essai de torsion

A test to determine the strength in torsion by measuring the torque required to twist a specimen of given length through a predetermined angle.

Ultrasonic Test / Essai par ultra-sons

Nondestructive test using waves of ultrasonic frequency.

X-Ray Test / Essai radiographique

Nondestructive test using x-rays.

Threadless Pipe / Tuyau non fileté (See Tube)

TIG Welding / Soudage par procédé TIG (See Welding)

Tin Bronze / Bronze à l'étain (See Copper Alloy—Phosphor Bronze)

Tinned Copper Wire / Fil de cuivre étamé

Copper wire which has been given a coating of tin.

Tinning (Hot-Dipping or Electro) / Étamage (par immersion ou électrolytique)

Deposition of a very thin layer of tin by hot-dipping or by electroplating.

Tolerance / Tolérance

The amount by which any characteristic, such as dimensional, chemical, physical or mechanical properties, may vary from that specified.

Torsion Test / Essai de torsion (See Tests)

Transcrystalline / Transcristallin(e)

A term usually applied to a type of crack that passes through the grains as opposed to one that follows the grain boundaries

Transcrystalline Cracking / Crique transcristallin(e)

Fracture of metal through the grain or crystals as distinguished from intercrystalline cracking.

Transformer / Transformateur

A device that transfers energy from one electric circuit to another without change of frequency and usually with a change in voltage.

Trimming / Rognage

1. Shearing of the irregular edge of a drawn part.
2. Removal of flash from a forging.
3. Removal of risers, gates and fins from a casting.

Trunnion Bearing / Coussinet de tourillon

A bearing for a trunnion housing.

TUBE / TUBE

A hollow product of round or any other cross-section, having a continuous periphery.

A.C.R. Tube (Air-Conditioning-Refrigeration) / Tube A.C.R. (Air climatisé et réfrigération)

Seamless copper tube in straight lengths which has been degreased, dehydrated, colour coded and ends sealed, and is specifically intended for refrigeration and air conditioning applications.

Automotive Service Tube / Tubes pour l'industrie automobile

Seamless copper tube of small diameter conforming to the standard series of sizes commercially known as Automotive and General Service tube, furnished in soft temper.

Bimetal Tube, Duplex Tube / Tube bimétallique

A finished tube consisting of two different metal tubes mechanically bonded together by drawing one inside the other.

Bourdon Gauge Tube / Tube de Bourdon

Seamless tube of uniform wall thickness and special (usually oval) cross-section, produced to special dimensional tolerances and special temper for use as a pressure actuated measuring device, as in a Bourdon gauge.

Brazed Tube / Tube roulé-brasé

Tube made from sheet or strip by forming and brazing.

Capillary Tube / Tube capillaire

Tube of small diameter with highest quality of inside surface and to close diameter tolerances, subject to special tests to insure precision and uniformity of bore, specially cleaned and packed.

Condenser Tube / Tube de condenseur (See Heat Exchanger Tube)

Copper Drainage Tube (DWV) / Tube d'évacuation en cuivre (DWV)

Seamless copper tube conforming to the particular dimensions commercially known as Copper Drainage Tube (DWV)

Copper Service Tube / Tube de cuivre pour branchements

Bendable copper water tube for underground water services.

Copper Water Tube / Tube en cuivre pour l'eau

Seamless copper tube conforming to the particular dimensions commercially known as Copper Water Tube and designated as Types "K", "L" and "M".

D. & S. Tube (Dehydrated-Ends-Sealed) / Tube déshumidifié et scellé

Seamless copper tube in coils which has been degreased, dehydrated, treated to retard internal discolouration, and ends sealed, and is specifically intended for refrigeration and air conditioning applications.

Duplex Tube / Tube bimétallique (See Bimetal Tube)

Finned Tube / Tube à ailettes

Tube having a series of metallic ribs on the outside or inside surface either parallel to the longitudinal axis or circumferentially extended from the tube to increase the effective surface area for heat transfer application.

Fluted Outside & Plain Inside Tube / Tube à cannelures extérieures

Tube having fluted outside periphery and plain inside periphery.

Fluted Tube / Tube à cannelures

Tube of nominally uniform wall thickness, having regular longitudinal concave corrugations with sharp cusps between corrugations.

Heat Exchanger Tube / Tube pour échangeur

Tube manufactured to special requirements as to dimensional tolerances, finish and temper for use in condensers and other heat exchangers.

Industrial Service Tube / Tube à usage industriel

Soft temper copper tube intended for use in gas and oil lines for machines and field repairs and alterations.

Lock Seam Tube / Tube agrafé

Tube made from sheet or strip, with a longitudinal, mechanically locked seam.

Nitrogenized Tube / Tube rempli d'azote

An ACR tube which has been degreased, dehydrated, pressurized with nitrogen and ends sealed.

Oil Burner Tube / Tube pour brûleur à l'huile

Small diameter seamless copper tube of soft temper in coils intended for use in oil burner installations.

Plain Inside & Fluted Outside Tube / Tube à cannelures extérieures (See Fluted Outside Tube)

Refrigeration Capillary Tube / Tube capillaire de réfrigération (See Capillary Tube)

Refrigeration Service Tube / Tube de réfrigération

Seamless copper tube in small diameters and conforming to the standard series of sizes, furnished in coils of soft temper with special inside cleanliness, dehydrated, with the ends sealed and intended for use in refrigeration installations.

Seamless Tube / Tube sans couture

Tube produced with a continuous periphery.

Sectional Tube / Tube profilé

Tube of nominally uniform wall thickness, in shapes such as rectangles, squares, triangles, half-rounds, ovals and ellipses.

Threadless Pipe / Tuyau non fileté

Seamless copper tube of standard pipe outside diameter conforming to particular dimensions commercially known as Type TP.

Welded Tube / Tube soudé

Tube made from sheet or strip with a longitudinal welded joint.

TUBE MEASUREMENT TERMS / TERMES POUR MESURAGE DES TUBES

Concentricity / Concentricité

Concentricity implies coincidence of centers of the OD and ID.

Diameter at any Point—Inside / Diamètre en un point intérieur quelconque

Inside diameter may be measured at any point around the periphery. Such individual measurements may depart from the nominal due either to the tube being larger than nominal, smaller than nominal, out-of-round or a possible combination of these.

Diameter at any Point—Outside / Diamètre en un point extérieur quelconque

Outside diameter may be measured at any point around the periphery. Such individual measurements may depart from the nominal due either to the tube being larger than nominal, smaller than nominal, out-of-round or a possible combination of these.

Diameter—Average Inside / Diamètre intérieur moyen

For all practical purposes the Average ID is the average, at only one cross-section, of the maximum and minimum measured diameters usually found at or very close to 90° to each other.

Diameter—Average Outside / Diamètre extérieur moyen

For all practical purposes the Average OD is the average, at any cross-section of the maximum and minimum measured diameters usually found at or very close to 90° to each other.

Eccentricity / Excentricité

The amount by which the maximum and minimum thicknesses at any cross-section of a round tube, measured at right angles to the axis of the tube, vary from the mean of these two measurements.

Wall Thickness—at any Point / Épaisseur de paroi en un point quelconque

Wall thickness may be measured at any point around the periphery. Such individual measurements may depart from the nominal due to the wall being either thicker than nominal or thinner than nominal, or to the tube being eccentric, or a possible combination of these.

Wall Thickness—Average / Épaisseur moyenne de paroi

For all practical purposes, the Average Wall Thickness is the average at any one cross-section of the maximum and minimum wall thickness, usually found at or very close to 180° apart.

Tube Plate / Plaque tubulaire

Plate manufactured to special flatness and thickness tolerances and furnished in various contours as tube plates or head plates in condensers and heat exchangers.

Tube Shell / Billette creuse

A hollow cylinder produced by casting, piercing or extrusion for subsequent drawing into tube.

Tube Sinking / Étirage sans mandrin

Drawing or rolling of tube without an internal support to control the inside diameter of the tube.

Tumbling / Polissage au tonneau (See Barrel Rolling)

Twist / Torsion

A winding departure from flatness.

Ultrasonic Test / Essai par ultra-sons (See Tests)

Upsetting / Refoulage

The working of metal to increase the cross-sectional area of all or of a portion of the piece.

Vacuum Annealing / Recuit sous vide

Annealing of metal in a vacuum to prevent contamination by air.

Vacuum Casting / Coulée sous vide

Melting in a vacuum to prevent contamination from air, as well as to remove gases already dissolved in the metal. The solidification may also be carried out in a vacuum or at low pressure.

Vacuum Melting / Fusion sous vide

Melting in a vacuum to prevent contamination from air, as well as to remove gases already dissolved in the metal.

Vent (Pipe) / Événement

A vent pipe connects a traditional drainage system with the outside air to allow circulation of air and protect the trap seals.

Wall Thickness—at any Point / Épaisseur de paroi en un point quelconque (See Tube Measurement Terms)

Wall Thickness—Average / Épaisseur moyenne de paroi (See Tube Measurement Terms)

Water Stain / Tache d'humidité (See Stains)

Waveguides / Guides d'ondes

Tubes used for the transmission of electrical energy in communications, microwave, radar, and other similar applications.

Wavy Edges / Rives ondulées

A wrinkled condition along the edges of the product, with a relatively flat center portion.

Welded Tube / Tube soudé (See Tube)

WELDING / SOUDAGE

Process of producing localized coalescence of metal by heating to suitable temperatures, with or without the application of pressure, and with or without the use of filler metal.

Carbon-Arc Welding / Soudage à l'arc au carbone

Welding in which an arc is maintained between a non-consumable carbon electrode and the work.

Coated Metal Arc Welding / Soudage avec électrodes enrobées

Arc welding in which the filler metal electrode is a metal wire coated usually with metal oxides or silicates.

Cold Pressure Welding / Soudage par déformation à froid

The surfaces to be joined must be prepared and cleaned so that they fit tightly together. Pressure is then applied to cause interface movements which bring the atoms of the surfaces close enough together that a weld ensues.

Electric Resistance Welding: Spot; Seam; Butt / Soudage par résistance électrique: par points; à la moulette; bout à bout

In resistance welding, coalescence is produced by the heat obtained from the resistance offered by the work to the flow of electric current in a circuit of which the work is part, and by the application of pressure.

Electron-Beam Welding / Soudage par bombardement électronique

Welding process wherein the heat is supplied by the bombardment of the joint area by a stream of high velocity electrons.

Fusion Welding / Soudage par fusion

Welding process wherein the base metal at the joint area is melted.

Gas Welding / Soudage au gaz

Welding process wherein the heat is supplied by a gas flame.

Gas Shielded Arc Welding / Soudage à l'arc sous gaz protecteur

Arc welding in which the arc and molten metal are shielded from the atmosphere by a stream of gas, such as argon or helium.

High-Frequency Welding / Soudage à haute fréquence

Welding process using a high-frequency electric current.

MIG Welding / Soudage par procédé MIG

Arc welding in inert gas with a consumable metal electrode.

Oxy-acetylene Welding / Soudage oxyacétylénique

Welding with an oxy-acetylene flame.

Plasma Arc Welding / Soudage à l'arc au plasma

Arc welding employing a special welding torch in which a copper nozzle, water cooled to prevent rapid deterioration by heat, constricts the arc and has the effect of raising the arc temperature.

Recrystallization Welding / Soudage par recristallisation

Term sometimes used for pressure welding. See *Cold Pressure Welding*.

Solid Phase Welding / Soudage par phase solide

Term sometimes used for pressure welding. See *Cold Pressure Welding*.

TIG Welding / Soudage par procédé TIG

Arc welding in an inert gas using a non-consumable tungsten electrode.

WELDING ROD / BAGUETTE POUR SOUDAGE

Filler metal, in wire or rod form, used in gas welding and brazing processes, and those arc welding processes, wherein the electrode does not furnish the filler metal.

Aluminum Bronze Welding Rod / Baguette de soudage en cupro-aluminium

Welding rod of aluminum bronze, usually Copper Alloy Nos. 618 and 622.

Cupro Nickel Welding Rod / Baguette de soudage en cupro nickel

Welding rod of cupro nickel, usually Copper Alloy No. 715.

Copper Welding Rod / Baguette de soudage en cuivre

Deoxidized copper filler metal, in wire or rod form, used in gas welding and brazing processes, and those arc-welding processes wherein the electrode does not furnish the filler metal.

Low Fuming Welding Rod / Baguette de soudage pour soudo-brasage

Manganese bronze type welding rod to which a small amount of silicon has been added to reduce the evolution of zinc oxide fumes in welding or brazing.

Manganese Bronze Welding Rod / Baguette de soudage en bronze manganèse

Welding rod of manganese bronze, usually Copper Alloy No. 675.

Wind-Up Reel / Bobine d'enroulement

A reel which rotates to wind a coil of rod, strip, tube, or wire, at the end of a stage in a process.

Wire / Fil

A solid section, other than strip, furnished in coils or on spools, reels or bucks.

Wire Bar / Barre à fil

A long rectangular cast copper or copper alloy bar with tapered ends, used for hot rolling into rod and wire.

Working Properties / Propriétés de déformation

The properties of a metal which effect the ease with which it can be worked or formed into desired shape or size.

Wrought Product / Produit ouvré

A product that has been produced by working the metal, by such means as rolling, extrusion, drawing, forging, and so forth.

X-Ray Test / Essai radiographique (*See Tests*)

Yellow Brass / Laiton jaune 65-35 (*See Copper Alloy*)

Yield Strength / Limite d'élasticité

As commonly applied to copper and copper alloys, yield strength is the stress which will produce an extension of .50 percent under load. It is known as Yield Strength .50 percent extension.

Zirconium Copper / Culvre au zirconium (*See Copper*)