

## GLOSSARY OF GRINDING TERMS

- **AA (arithmetical average)** - The preferred mathematical measure of surface finish.
- **ABRASIVE** - The material from which the grains in the wheel are made--usually crystalline aluminum oxide, silicon carbide, or diamond.
- **ALUMINA** - Aluminum oxide, AL<sub>2</sub>O<sub>3</sub>.
- **ALUMINUM OXIDE** - The chemical name for the hard abrasive substance found in natural emery and corundum, and for ALUNDUM. made by fusing natural bauxite in an electric furnace.
- **ARBOR** - The spindle of a grinding machine on which the wheel is mounted,
- **ARBOR HOLE** - The hole in a grinding wheel sized to fit the machine arbor or spindle,
- **ARC OF CONTACT** - The portion of the circumference of a grinding wheel in contact with the work,
- **BALANCE (static)** - A grinding wheel is in static balance when, centered on a frictionless horizontal arbor, it remains at rest in any position.
- **BALANCE (dynamic)** - A wheel in static balance is also in dynamic balance if, upon rotating, there is no vibration or whip due to unequal distribution of weight throughout its mass.
- **BALANCING** - Testing for balance; adding or subtracting weight to put a grinding wheel into either static or. dynamic balance.
- **BLOTTER** - A paper disc used between a grinding wheel and its mounting flanges
- **BOND** - The material which cements the grains together making up the wheel; the bond may be rubber, shellac, resin, or vitrified material.
- **BURN** - Visible discoloration, or sub-surface damage, from excessively high temperature produced by grinding.
- **CENTERLESS GRINDING** - Grinding by supporting the workpiece on its OD or ID and rotating it around an axis created by this reference surface; the work part is free to shift and if the support surface is the one being ground, the axis of rotation also shifts.
- **CENTERTYPE GRINDING** - Grinding by rotating the work part around a fixed centerline established by the chuck or centers in which it is held.
- **CHATTER** - A surface finish pattern caused by vibration of the wheel and/or work.
- **CHECKS** - Very small, often microscopic, cracks.
- **CHUCK** - A device for holding grinding wheels of special shape or the workpiece being ground.
- **CONE WHEEL** - A small wheel shaped like a bullet nose which is used for portable grinding,
- **COOLANT** - The fluid used to cool the work being ground; it may be either plain water, straight oil, water-soluble oil or a compound,
- **CORNER WEAR** - The tendency of a grinding wheel to wear on its corner so that it does not grind up to a shoulder without leaving a fillet.
- **CRACKS** - Fissures in the work occurring or exposed during grinding.
- **CREEP FEED GRINDING** - A technique of plunge grinding with special design surface grinding machines where the ta-

## GLOSSARY OF GRINDING TERMS (cont.)

- **CREEP FEED GRINDING** - A technique of plunge grinding with special design surface grinding machines where the table speeds are kept very low and the wheel is fed down to full depth of cut in one or two passes.
- **CUP WHEEL** - A grinding wheel shaped like a cup or bowl designed for grinding on the rim.
- **CUT-OFF WHEEL** - A thin abrasive wheel usually made with an organic bond, for cutting off or slotting any material or part.
- **CUTTING SURFACE** - The surface or face of the wheel against which the material is ground.
- **CYLINDER WHEEL** - A grinding wheel having a relatively large hole in proportion to its diameter, and usually several inches thick for grinding on the rim.
- **CYLINDRICAL GRINDING** - Grinding the outside surface of a cylindrical part mounted on centers.
- **DISC GRINDER** - A machine on which abrasive disc wheels are used.
- **DISC WHEEL (abrasive disc)** - A grinding wheel shaped like a straight-wheel but usually-mounted on a plate for grinding on the side of the wheel.
- **DISH WHEEL** - A wheel shaped like a dish and commonly used for sharpening cutters.
- **DRESSERS** - Tools used for dressing a grinding wheel,
- **DRESSING** - A grinding wheel is dressed to improve or alter its cutting action; the dressing action removes the outside layer of dulled abrasive grains and any loading of metal or foreign material that the wheel may have picked up so that new and sharp grains are presented to the work.
- **DUCTILE** - Capable of being readily pressed or drawn or otherwise formed into various shapes.
- **EMERY** - A natural abrasive of the aluminum oxide type.
- **FEED LINES** - An objectionable spiral pattern produced on the work in grinding,
- **FEED, CROSS (Surface Grinding)** - The increment of horizontal feed of the wheel across the chuck or table.
- **FEED, DOWN (Surface Grinding)** - The rate at which the abrasive wheel is fed into the work.
- **FINISH** - The surface quality or appearance, such as that produced by grinding or other machining operation
- **FINISH SIZE** - The required part diameter.
- **FINISHING** - The final cuts taken with a grinding wheel to obtain the dimensional accuracy and surface finish desired.
- **FISHTAILS** - Short, comet-like scratches caused by loose grains, or grains in the coolant, which are carried around by the wheel for only part of a revolution.
- **FLANGES** - The circular metal plates on a grinding machine used to support and drive the grinding wheel (see wheel sleeves).
- **FLARING CUP** - A cup wheel with the rim extending from the back at an angle so that the diameter at the outer edge is greater than at the back.
- **FLOOR STAND GRINDER** - An offhand grinder, mounting either one or two wheels running on a horizontal spindle fixed to a metal base and set on the floor.

## GLOSSARY OF GRINDING TERMS (Cont.)

- **GLAZED WHEEL** - A wheel with a cutting surface too smooth to grind efficiently; glazing is caused by worn or improperly dressed grains.
- **GLAZING** - The dulling of the cutting particles of a grinding wheel as when a wheel is too hard for the job, resulting in a decreased rate of cut.
- **GRADE** - The strength of bonding of a grinding wheel, frequently referred to as its hardness.
- **GRAIN** - The tiny particles of abrasive which, with the bond, make up the wheel; it is the grains which do the actual cutting.
- **GRAIN SIZE** - The size of the abrasive particles of a grinding wheel or polishing abrasive.
- **GRINDING** - Removing material with a rotating grinding wheel.
- **GRINDING ACTION** - Refers to the cutting ability of, and the finish produced by, a grinding wheel.
- **GRINDING WHEEL** - A cutting tool of circular shape made of abrasive grains bonded together; its cutting action is derived from its peripheral speed.
- **GUARDS** - Metal hoods used to protect personnel and equipment in case of accidental grinding wheel breakage.
- **HARD ACTING WHEEL** - Grinding wheel that retains its dull abrasive grains.
- **HUNTINGTON DRESSER** - A hand tool equipped with star-shaped cutters for truing and dressing grinding wheels, invented by a man named Huntington.
- **ID (inside diameter)**: Refers to the arbor hole of the grinding wheel.
- **IN-FEED** - The advance of the wheel toward and into the material (stock) to be ground away.
- **INSERTED NUT** - Disc, segment or cylinder wheels having nuts embedded in the back surface for mounting on the grinding machine.
- **INTERNAL GRINDING** - Grinding the surface of a hole in the workpiece.
- **LAPPING** - A finishing process generally employing loose abrasive grain, but now often including similar types of operation with bonded abrasive wheels.
- **LOADED WHEEL** - A wheel with the voids between the grains filled with metal particles or grinding debris.
- **LOADING** - Filling of the pores of the wheel face with the material being ground, usually resulting in a decrease in rate of cut and poor finish.
- **OFFHAND GRINDING** - Where the work is held in the operator's hand, otherwise known as free hand grinding.
- **OILSTONE** - A natural or manufactured abrasive stone impregnated with oil and used for touching up keen edged tools and for miscellaneous uses in machine shops, tool and die plants and woodworking shops.
- **OPERATING SPEED** - The speed of revolution of a grinding wheel expressed in either revolutions per minute (r.p.m.) or surface feet per minute (s.f.p.m.).
- **ORGANIC BOND** - A bond consisting of an organic material such as rubber, synthetic resin, epoxy or shellac.
- **PERIPHERAL SPEED** - The speed at which a point on the face of a wheel is traveling when the wheel is revolving, expressed in surface feet per minute (sfpm), or meters per second (m/s).

## GLOSSARY OF GRINDING TERMS (Cont.)

**PROFILOMETER** - An instrument for measuring the degree of surface roughness in micro-inches, RMS (root mean square).

- **RECESSED WHEELS** - Grinding wheels made with a depression in one side or both sides to fit special types of flanges or sleeves provided with certain grinding machines.
- **REINFORCED RESINOID BOND** - A resinoid (synthetic resin) bond reinforced with layers of glass cloth or other fabric material to increase the strength of thin wheels and discs used for cutting-off, deburring and weld grinding.
- **RESINOID BOND** - A bonding material described commercially as synthetic resin.
- **REST** - That part of a grinding wheel stand which is used to support the work, dresser or truing tool when applied to the grinding wheel.
- **RMS (root mean square)** - A mathematical measure of surface finish.
- **ROCKWELL HARDNESS TESTER** - A machine for testing the indentation hardness of all metals.
- **ROLL GRINDING MACHINE** - A special type of cylindrical grinding machine for grinding cylindrical rolls to be used for rolling metals, paper, or rubber.
- **ROUGH FEED** - Feeding with a relatively large increment; usually done early in the cycle for fast stock removal.
- **ROUGH GRINDING** - The first grinding operation for removing stock rapidly without regard to the finish produced by the wheel
- **R.P.M. (revolutions per minute)** - The number of rotations of the wheel or the workpiece per minute.
- **RUBBER BOND** - A bonding material whose principal constituent is natural or synthetic rubber.
- **SCLEROSCOPE** - An instrument for determining the relative hardness of materials by a drop and rebound method.
- **SCRATCHES** - Marks left on a ground surface usually caused by dirty coolant or a grinding wheel unsuited for the operation.
- **SEGMENTS** - Bonded abrasive sections of various shapes to be assembled to form either a continuous or an intermittent grinding surface.
- **S.F.P.M.** - Surface feet per minute (see "Peripheral Speed"); to get surface speed in feet per minute, the circumference in feet is multiplied by the wheel revolutions per minute.
- **SHELLAC BOND** - A bonding material for grinding wheels, the principal constituent of which is flake shellac.
- **SILICON CARBIDE** - An abrasive (SiC) produced by the reaction of coke and silica sand in a resistance type electric furnace.
- **SOFT ACTING WHEEL** - Grinding wheel that loses its abrasive grains before they are dull.
- **SNAGGING** - Grinding which removes relatively large amounts of material without regard to finish, typically the removal of gates, fins, sprues, and parting lines from castings, surface defects from billets, and excess metal from welds.
- **STEADYREST** - A support for long and slender pieces being ground on a cylindrical grinding machine to facilitate grinding them round and straight.
- **STOCK** - Material to be ground from the workpiece to produce the required size.
- **STRAIGHT WHEEL** - A grinding wheel of any dimension which has straight sides, a straight face, and a straight or ta-

## GLOSSARY OF GRINDING TERMS (Cont.)

- **STRUCTURE** - A general term referring to the proportion and arrangement of abrasive and bond in an abrasive product.
- **STUB** - That portion of a grinding wheel left after having been worn down to the discarding diameter.
- **SURFACE GRINDING** - Grinding a flat plane surface.
- **SWING FRAME GRINDER** - A grinding machine suspended by a chain at the balancing point so that it can be turned and swung in any direction for the grinding of billets, large castings or other heavy work.
- **TABLE** - That part of the grinding machine which directly or indirectly supports the work being ground.
- **TABLE TRAVERSE** - Reciprocating movement of the table of a grinding machine.
- **TENSILE STRENGTH** - The strength of a material when tested in tension; usually expressed in pounds per square inch.
- **WHEEL SLEEVES** - A form of flange used on precision grinding machine's where the wheel hole is larger than the machine spindle; usually the sleeve is so designed that the wheel and sleeve are assembled as a single unit for mounting on the spindle.
- **WHEEL SPEED** - The speed at which a grinding wheel is revolving, measured either in revolutions per minute or in surface feet per minute.
- **WHEEL STRUCTURE**. - The character of the wheel as determined by the proportion and the arrangement of the grains and bond.
- **WHEEL TRAVERSE** - Rate of movement of wheel across the work..
- **WORK** - Designation for the piece being ground or polished.
- **WORK SPEED** - In cylindrical, centerless and internal grinding, the rate at which the work revolves, measured in either r.p.m. or s.f.p.m. in surface grinding, the rate of table traverse measured in feet per minute.
- **WORK SURFACE** - That part of the work being ground.