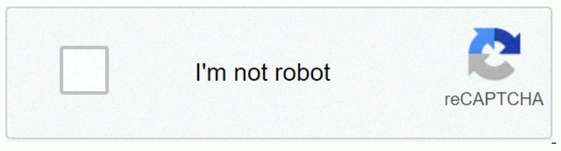

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Sharpening stone grit chart

Abrasive plate used to sharpen tools Waterstone redirects here. For the British bookstore chain, see Waterstones. This article needs additional citations for verification. Help improve this article by adding citations to trusted sources. Unmapped material can be questioned and removed. Find sources: Sharpening stone – news · newspapers · books · scholar · JSTOR (April 2009) (Learn how and when to remove this template message) An oil stone sharpening stones, water stones or whetstones is used to sharpen the edges of steel tools and utensils by grinding and browning. Examples of items that can be sharpened with a sharpening stone include scissors, scythes, knives, razors and tools such as chisels, hand scrapers and flat blades. Sharpening stones come in a wide range of shapes, sizes, and material compositions. Stones can be flat, to work flat edges, or shaped for more complex edges, such as those associated with certain wood carving or woodturning tools. They may be composed of natural lyre material, or of human-made materials. Stones are usually found in different qualities, which refer to the grit size of the abrasive particles in the stone. Grit size is given as a number, indicating the spatial density of the particles. A higher number denotes a higher density and therefore smaller particles, which leads to a finer finish of the surface of the polished object. Terminology Though whetstone is often mistaken as a reference to the water sometimes used to lubricate such stones, the term is based on the word whet, which means sharpening a leaf,[1][2] not on the word wet. The verb nowadays usually used to describe the process of using a sharpening stone is to sharpen, but the older term to whet is still sometimes used. The term to whet is so rare in this sense that it is no longer mentioned in for example Oxford living Dictionaries. [3] [4] Natural stones versus artificial stones The Roman historian Pliny described the use of several naturally occurring stones for sharpening in his Natural History. He describes the use of both oil and water stones and provides the locations of several ancient sources for these stones. [5] The use of natural stone for sharpening has decreased with the widespread availability of high-quality, consistent particle-sized artificial stones. As a result, the legendary Honyama mines in Kyoto, Japan, have been closed since 1967. Belgium currently has only a single mine that is still quarry Coticules and their Belgian Blue Whetstone (BBW) counterparts. [6] Modern synthetic stones are generally of equal quality with natural stones, and are often considered superior in sharpening performance due to the consequence of particle size and control over the properties of the stones. For example, the proportional content of abrasive particles as opposed to base or binder be controlled to make the stone carved faster or slower, as desired. [7] Natural stones are often praised for their natural beauty beauty stones and their rarity, providing added value as collectibles. Furthermore, each natural stone is different, and there are rare natural stones that contain abrasive particles in grit sizes finer than are currently found in artificial stones. [citation needed] One of the most well-regarded natural whet stones is the yellowish-grey Belgian Coticule, which has been legendary for the edge it can give to leaves since Roman times, and has been erupting for centuries from the Ardennes. The slightly coarser and more abundant Belgian Blue whetstone is found naturally with the yellow coticule in the adjacent strata; hence two-sided whetstones are found, with a naturally occurring seam between the yellow and blue layers. These are highly appreciated for their natural elegance and beauty, and to provide both a quick-cutting surface to establish a bevel and a finer surface for refining it. This stone is considered one of the finest for sharpening straight razors. [citation needed] The hard rock in Charnwood Forest in north-west Leicestershire, England, has been mined for centuries,[8] and was a source of whet stones and quern stones. Whetstones and oilstones Whetstones can be natural or man-made stones. Artificial stones usually come in the form of a bonded abrasive consisting of a ceramic such as silicon carbide (carborundum) or of alumina (corundum). Bonded abrasives provide a faster cutting action than natural stones. They are widely available as a double-sided block with a rough gravel on one side and a fine gravel on the other allowing a stone to satisfy the basic requirements of sharpening. Some shapes are designed for specific purposes such as sharpening scythes, drills or serrations. [9] Natural stones are typically formed by quartz, such as novaculite. The Ouachita Mountains of Arkansas are noted as a source for these. Novaculite is also found in Syria and Lebanon, formerly part of the Ottoman (Turkish) Empire, hence the use of the older name in the Americas of Turkey stone. [10] When the block is intended for mounting on a bench, it is called a bench stone. Small, portable stones (usually made of bound abrasives) are called pocket stones. Being smaller, they are more portable than bench stones but currently difficulty maintaining a consistent angle and pressure when dragging the stone along larger leaves. However, they can still form a good edge. Often fine-grained pocket stones are used for browning, especially in the field. Despite being a homophone with wet in most dialects of modern English, whetstones do not need to be lubricated with oil or water, although it is very common to do so. Lubrication aids cutting action and carries swarf away. Japanese water stones Two Japanese water stones The Japanese traditionally used natural sharpening stones lubricated with water (using oil on a water stone reduces its effectiveness). The geology of Japan as a type of stone consisting of fine silicate particles in a clay matrix, softer than novaculite. [11] Japanese stones are also sedimentary. The most famous are usually mined in the Narutaki district just north of Kyoto. [citation needed] Varieties of waterstones Historically, there are three wide degrees of Japanese sharpening stones: ara-to, or coarse stone, naka-to or mid/medium stone and shiage-to or finishing stone. There is a fourth type of stone, the nagura, which is not used directly. Rather, it is used to form a cutting slurry on shiage-to, which is often too difficult to create the necessary sludge. Converting these names to absolute gravel size is difficult because the classes are wide and natural stones have no inherent gravel numbers. As an indication, the ara-to is probably (using a non-Japanese system for grading gravel size) 500-1000 grit. Naka-to is probably 3000–5000 gravel and shiage-to is probably 7000–10000 gravel. Current synthetic gravel values range from extremely coarse, such as 120 gravel, through extremely fine, such as 30,000 gravel (less than half a microns abrasive particle size). [citation needed] Diamond plate A diamond plate A diamond plate is a steel plate, sometimes mounted on a plastic or reaw base, coated with diamond grit, an abrasive that will grind metal. When fitted they are sometimes called diamond stones. [12] The plate can have a series of holes that are cut into it that captures the swarf molded off as grinding occurs, and cuts costs by reducing the amount of abrasive surface on each plate. Diamond plates can serve many purposes including sharpening steel tools, and for maintaining flatness of artificial water stones, which can become grooved or hollowed out in use. Truing (flat a stone whose shape has changed as it wears off) is generally considered crucial to the sharpening process but some hand sharpening techniques utilize the high points of a non-true stone. As the only part of a diamond plate to wear off is a very thin coating of gravel and glue, and in a good diamond plate this wear is minimal due to diamond hardness, a diamond plate retains its flatness. Rubbing the diamond plate on a whetstone to true (flat) whetstone is a modern alternative to more traditional truing methods. [13] Diamond plates are available in different sheet metal sizes (from credit card to countertop size) and grades of gravel. A coarser gravel is used to remove larger amounts of metal faster, such as when you form an edge or restore a damaged edge. A finer gravel is used to remove scratches of larger grains and to refine an edge. There are two-sided tiles with each side coated with a different gravel. [14] The diamond sharpeners of the highest quality use monocrystalline diamonds, single structures that will not break, giving them an excellent life span. These diamonds are bonded to a precision ground surface, as in nickel, and galvanized. This process locks the diamonds in place. [14] Hobby microscope view of a 220 grit diamond sharpening stone. Small diamonds to a perforated metal carrier strip and tied to a plastic slope. The function identified by the red line above it measures about 0.08 mm across. The dark area at the top left is a void designed to clear the swarf created during the sharpening from the diamonds. This relatively coarse stone would be used to reshape a damaged leaf edge that would be refined by finer gravel stones. Grit size There is no dominant standard for the ratio of gravel size to particle diameter. Part of the difficulty is that gravel size is used to refer to the smoothness of the finish produced by a sharpening stone, and not just the actual size of gravel particles. Other factors apart from particle diameter that affect the finish (and thus grit size rating) are: the form of grinding or polishing, how much of each particle is exposed by the binder, friability (if abrasive particles can be broken into smaller ones by the pressure of grinding or polishing), hardness of abrasive particles, and the chemical composition of the abrasive particles (common abrasives include diamond, cubic bornitride (CBN) , chromium(III) oxide, tungsten carbide, silicon carbide and other ceramics). In synthetic stones, the grit size is related to the mesh size used to select the particles to be included in abrasives. Sandpaper also uses a similar system. Here are some typical sharpening stone gravel sizes and their uses when sharpening steel knives: Grit size Approximate particle diameter Typical use[15][16] 200 80 µm Remove chips from a damaged blade 500 30 µm Coarsely sharpen sa a blunt edge 1000 8 µm Equalization of a rough edge to a medium edge 4 000 4 µm Equalization of a medium edge to a sharp edge to cut meat 8 000 2 µm Further smoothing a sharp edge for to cut fish or vegetables (senor (senor in meat will bend an edge this sharp) 30,000 0.5 µm Polishing an edge to a mirror-smooth (but possibly fragile) finish. Standards for gravel size measurements include JIS, CAMI, ANSI, FEPA-P (for sandpaper), FEPA-F (for metal abrasives), and various trademarked standards for individual enterprise product ranges. [17] [18] [19] [20] See also Grinding Wheel Honing Steel Knife Sharpening Razor Strap – Device for Straightening and Polishing Blades Scary Sharpening a Scythe Jig References ^ Whet, Dictionary.com. 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