

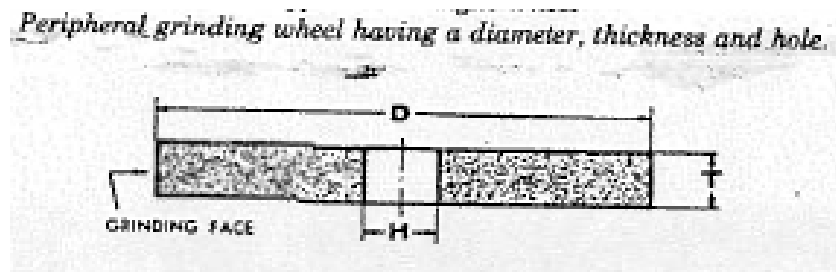
4123:1-5-12 Appendix

5.12.1 - TYPE 1 STRAIGHT WHEELS

Definition: Type 1 straight wheels have diameter, thickness and hole size dimensions and should be used only on the periphery. Type 1 wheels shall be mounted between flanges.

Limitation: Hole dimension (H) should not be greater than two-thirds of wheel diameter dimension (D) for precision, cylindrical, centerless or surface grinding applications. Maximum hole size for all other applications should not exceed one-half wheel diameter. Inorganic wheels used in snagging operations should have a maximum hole size of not more than one-quarter of the wheel diameter.

Figure: Type 1 - Straight Wheel

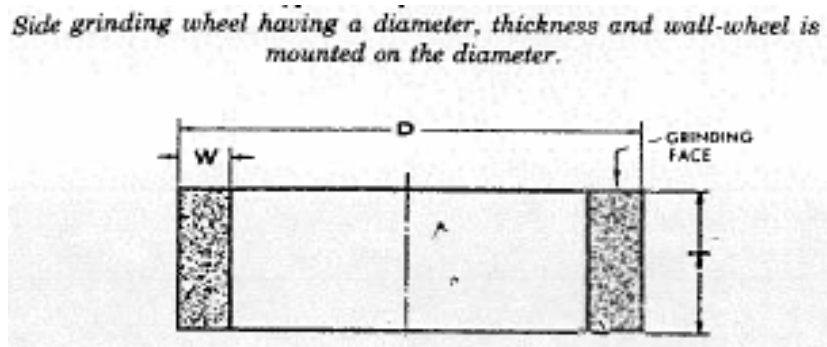


5.12.2 - TYPE 2 CYLINDER WHEELS

Definition: Type 2 cylinder wheels have diameter, wheel thickness and rim thickness dimensions. Grinding is performed on the rim face only, dimension W. Cylinder wheels may be plain, plate mounted, inserted nut or of the projecting stud type.

Limitation: Rim height, T dimension, is generally equal to or greater than rim thickness, W dimension.

Figure: Type 2 - Cylinder Wheel

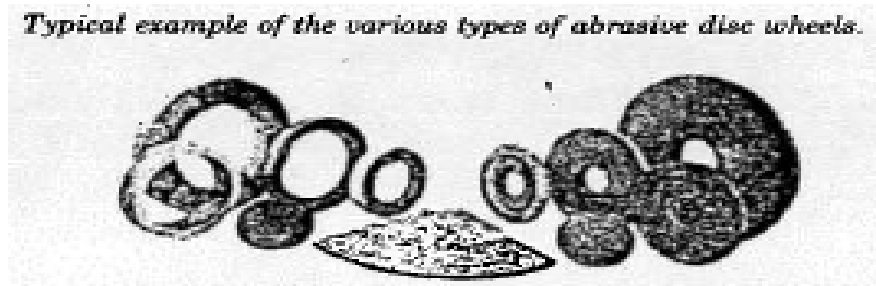


5.12.3 - ABRASIVE DISC WHEELS

Definition: Abrasive discs have diameter, thickness and hole size dimensions. They are used in a manner similar to Type 2 cylinder wheels.

Limitation: Wheel thickness, T dimension, must be less than rim thickness, W dimension.

Figure: Abrasive Disc Wheels

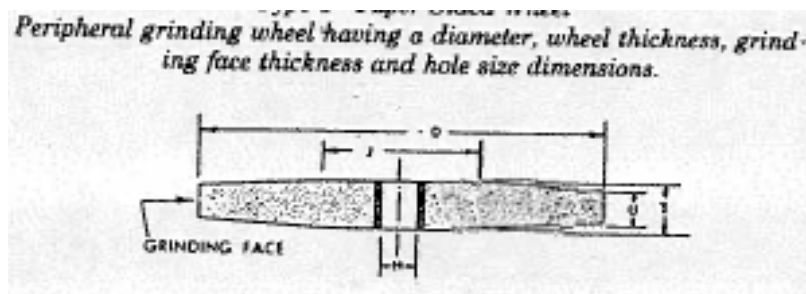


5.12.4 - TYPE 4 TAPER SIDED WHEELS (Non Standard Shape)

Definition: Type 4 taper sided wheels have diameter, wheel thickness, grinding face thickness and hole size dimensions. Type 4 wheels have the same limitations on hole size and usage as Type 1 wheels.

Limitation: Grinding face, thickness dimension U, must be equal to or greater than one-half T dimension. J dimension shall be large enough to accommodate suitable flanges. If tapered safety flanges are used, J dimension and degree of taper required shall be determined by the wheel manufacturer.

Figure: Type 4 - Taper Sided Wheel



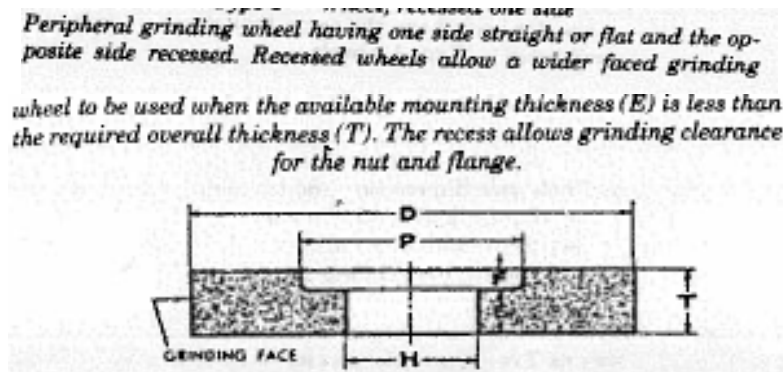
5.12.5 - TYPE 5 RECESSED ONE SIDE WHEELS

Definition: Type 5 recessed one side wheels have diameter, thickness and hole size dimensions and in addition also have a recess diameter and depth dimension. Type 5 wheels are subject to the same limitations of use and mounting as Type 1 wheels.

Limitation: Type 5 wheels are subject to the same limitation of hole size as Type 1 wheels definition 5.12.1.

In addition, recess depth, F dimension, should not exceed 50% of wheel thickness, T dimension, and diameter of recess, P dimension, shall be large enough to accommodate a suitable flange.

Figure: Wheel, recessed one side

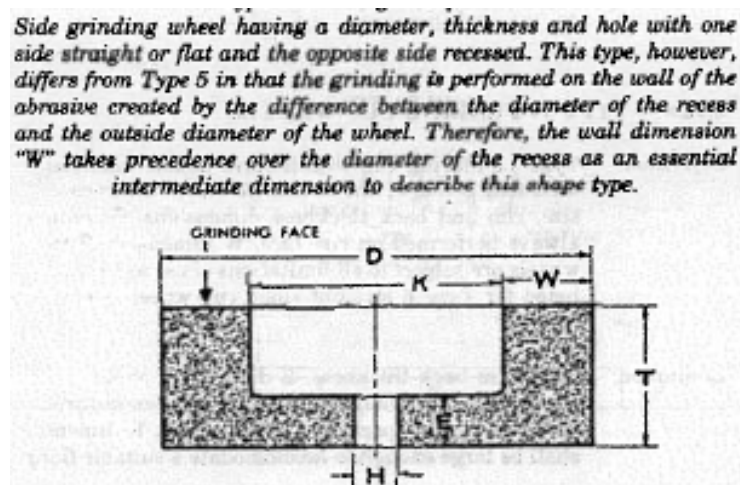


5.12.6 - TYPE 6 STRAIGHT CUP WHEELS

Definition: Type 6 cup wheels have diameter, thickness, hole size, rim thickness and back thickness dimensions. Grinding is always performed on rim face, W dimension.

Limitation: Minimum back thickness, E dimension, should not be less than 1/4 T dimension. In addition, when unthreaded hole wheels are specified, the inside flat, K dimension, must be large enough to accommodate a suitable flange.

Figure: Type 6 - Straight Cup Wheel



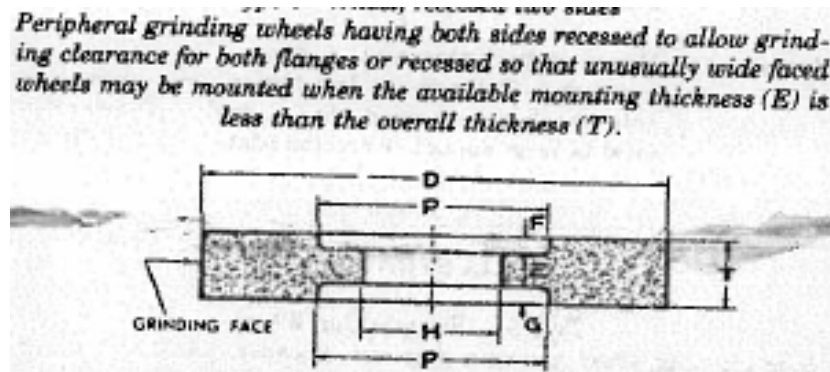
5.12.7 - TYPE 7 DOUBLE RECESSED WHEELS

Definition: Type 7 double recessed wheels have diameter, thickness and hole size dimensions and in addition also have recess diameters and depth dimensions. Type 7 wheels are subject to the same limitations of use and mounting as Type 5 wheels, definition 5.12.2.

Limitation: Type 7 wheels are subject to the same limitation of hole size as Type 1 wheels, section 5.12.1.

In addition, the combined depths of the recess, F and G dimensions, should not exceed 50% of wheel thickness, T dimension.

Figure: Type 7 - Wheel, recessed two sides



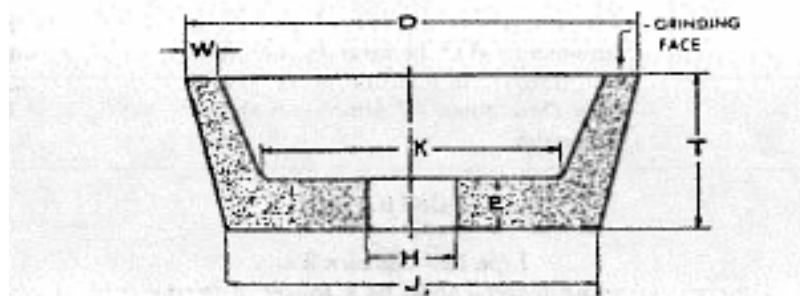
5.12.8 - TYPE 11 FLARING CUP WHEELS

Definition: Type 11 Flaring cup wheels have double diameter dimensions D and J, and in addition have thickness, hole size, rim and back thickness dimensions. Grinding is always performed on rim face, W dimension. Type 11 wheels are subject to all limitations of use and mounting listed for Type 6 straight sided cup wheels, definition 5.12.6.

Limitation: Minimum back thickness, E dimension, should not be less than 1/4 T dimension. In addition when unthreaded hole wheels are specified the inside flat, K dimension, shall be large enough to accommodate a suitable flange.

Figure: Type 11 - Flaring Cup Wheel

Side grinding wheel having a wall flared or tapered outward from the back. Wall thickness at the back is normally greater than at the grinding face (W).

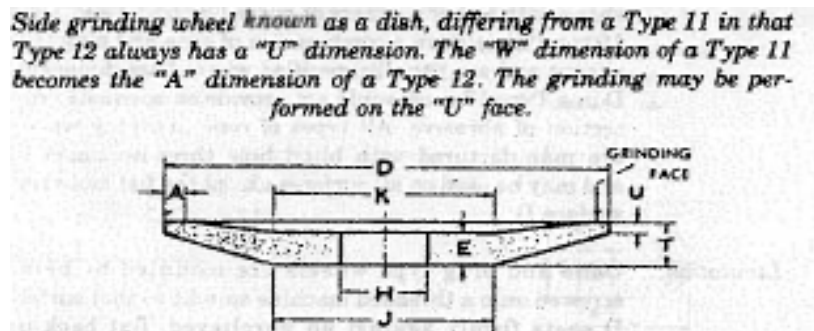


5.12.9 - TYPE 12 DISH WHEELS

Definition: Type 12 dish wheels have diameter, thickness, rim thickness and back thickness dimensions. In addition Type 12 wheels always have a face thickness, U dimension. Grinding may be performed on both A and U dimensions.

Limitation: Minimum back thickness, E dimension, should be equal to or greater than 1/2 wheel thickness, T dimension. If unthreaded hole wheels are specified K dimension shall be large enough to accommodate a suitable flange.

Figure: Type 12 - Dish Wheel

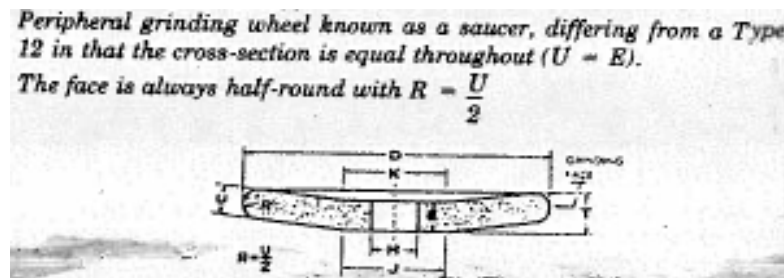


5.12.10 - TYPE 13 SAUCER WHEELS

Definition: Type 13 saucer wheels have diameter, thickness, hole size and back thickness dimensions. Grinding shall be performed on wheel periphery, U dimension, only.

Limitation: Where unthreaded hole wheels are specified, J and K dimensions shall be large enough to accommodate suitable flanges. In addition, wheel thickness shall be uniform throughout, U dimension should always equal E dimension.

Figure: Type 13 - Saucer Wheel



5.12.11 - TYPES 16, 17, 18, 18R & 19 CONE & PLUG WHEELS

Definition: Type 16 cones have a curved side with a nose radius Type 17 cones have straight sides with or without a nose radius. Types 18 and 18R plug wheels are cylindrical in shape with either a square or curved grinding end. Type 19 cone wheels are a combination of cone and plug type shapes and are usually specified where base dimension D in a Type 17 cone would not provide an adequate cross section of abrasive. All types of

cone and plug wheels are manufactured with blind hole threaded bushings and may be used on all surfaces except the flat mounting surface D.

Limitation: Cone and plug type wheels are mounted by being screwed onto a threaded machine spindle so that surface D seats firmly against an unrelieved, flat back-up flange. It is recommended that the maximum size or mass of the above cones and plugs be not greater than that of a 3" diameter by 5" long Type 18 plug wheel.

Figure: Type 16 - Cone, curved side

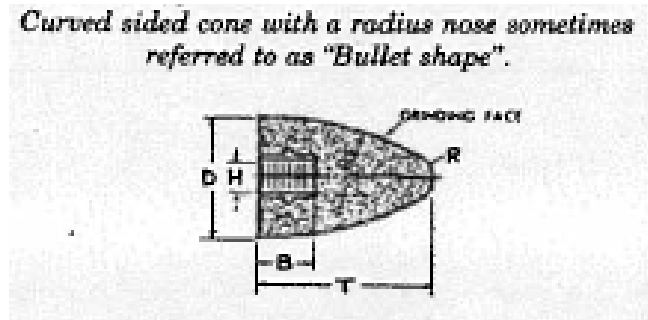
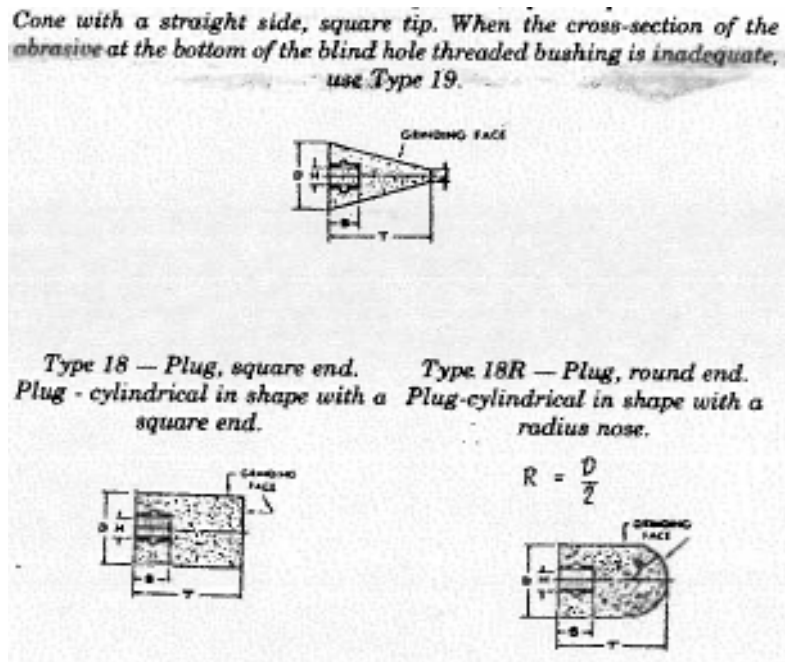
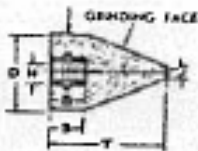


Figure: Types 17, 18, 18R and 19 - Cone and Plug Wheels



Combination cone and plug with a square tip similar to Type 17 and the cylindrical portion similar to Type 18. The cylindrical portion "S" is normally equal to or greater than the depth of the blind hole threaded bushing "B".



5.12.12 - TYPES 20, 21, 22, 23, 24, 25, 26 RELIEVED AND/OR RECESSED WHEELS

Definition: Types 20 through 26 relieved and/or recessed wheels have diameter, thickness, hole size, recess diameter and depth dimensions and in addition may be concaved on one or both sides. Types 20 through 26 wheels are subject to the same limitations of use and mounting as Type 5 wheels, definition 5.12.5.

Limitation: Concaved relief depths shall be considered as recesses and added to straight recess depth or depths for determination of total wheel recess depth. Total recess depths should not exceed 50% of wheel thickness, T dimension.

Figure: Types 20 and 21 - Relieved wheels

Peripheral grinding wheel having one side straight or flat and the other side relieved to a flat.



Peripheral grinding wheel having both sides relieved to a flat.



Figure: Types 22, 23, 24, 25 and 26 - Relieved and recessed wheels

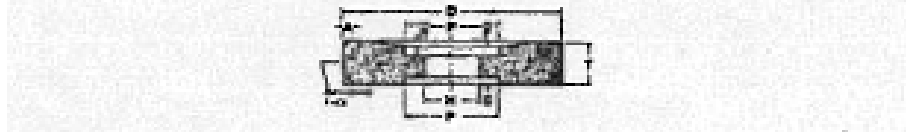
Peripheral grinding wheel having one side recessed and the other side relieved to a flat.



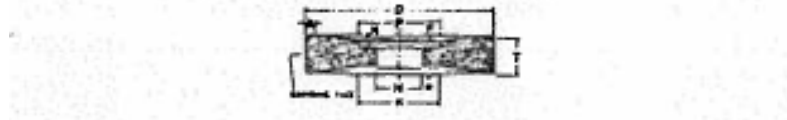
Peripheral grinding wheel having one side straight or flat and the other side relieved to a recess.



Peripheral grinding wheel having one side recessed and the other side relieved to a recess.



Peripheral grinding wheel having one side relieved to a flat and the other side relieved to a recess.



Peripheral grinding wheel having both sides relieved to a recess.



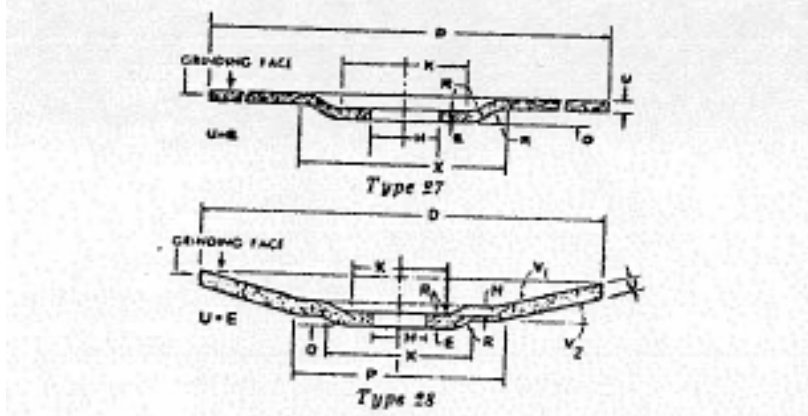
5.12.13 - TYPES 27 AND 28 DEPRESSED CENTER WHEELS

Definition: Types 27 and 28, depressed center wheels, have diameter, thickness and hole size dimensions. Both types are reinforced, organic bonded wheels having off-set hubs which permit side and peripheral grinding operations without interference with the mounting. Type 27 wheels are manufactured with flat grinding rims permitting notching and cutting operations. Type 28 wheels have saucer shaped grinding rims.

Limitation: Special supporting, back adaptor and inside flange nuts are required for the proper mounting of these types of wheels.

Figure: Types 27 and 28 - Wheels, depressed center

Peripheral grinding wheel having an offset center and used on right angle head portable grinders. Grinding may also be done on the side of the wheel.

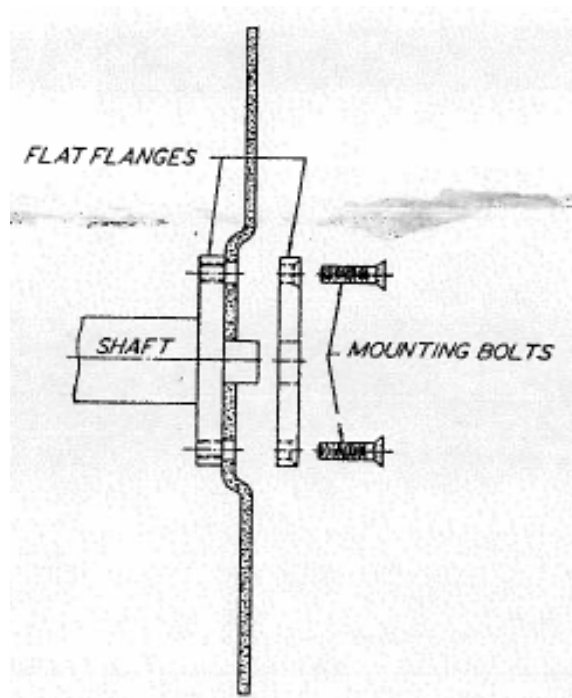


5.12.14 - TYPE 27A DEPRESSED CENTER WHEELS

Definition: Type 27A depressed center, cutting-off wheels have diameter, thickness and hole size dimensions. They are reinforced, organic bonded, off-set hub type wheels, usually 16" diameter and larger, specially designed for use on cutting-off machines where mounting nut or outer flange interference cannot be tolerated.

Limitation: See illustration for mounting details.

Figure: Type 27A wheel, mounting details



5.12.15 - CUTTING OFF WHEELS

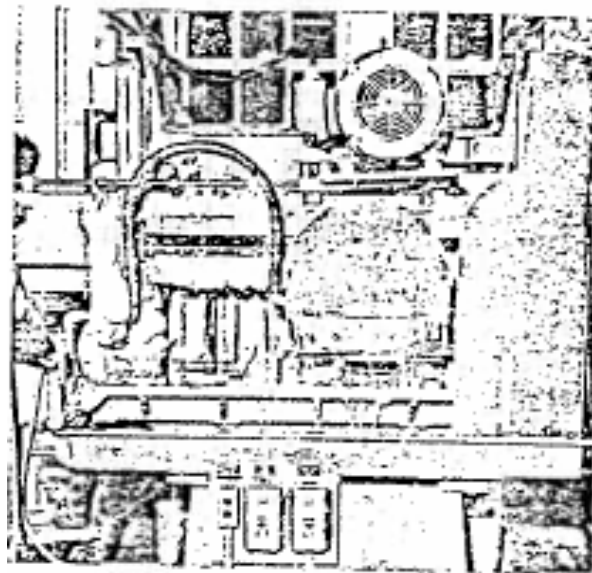
Definition: Cutting off wheels have diameter, thickness and hole size dimensions and are subject to all limitations of mounting and use listed for Type 1 wheels, definition 5.12.1. They may be steel centered, diamond abrasive or organic bonded abrasive of the plain or reinforced type.

Limitation: Cutting off wheels are recommended only for use on specially designed and fully guarded machines and are subject to the following maximum thickness and hole size limitations.

Wheel Diameter	Maximum Thickness _____
6" and smaller	3/16"
Larger than 6" to 12"	1/4"
Larger than 12" to 23"	3/8"
Larger than 23"	1/2"

Maximum hole size for cutting-off wheels should not be larger than 1/4 wheel diameter.

Figure: Wet machine with horizontal movement for slabbing



5.12.16 - COPING WHEELS

Definition: Coping wheels are peripheral cutting wheels, and have diameter, thickness and hole size dimensions. They may be metal or organic bonded, solid or steel centered, and are subject to the same limitations of use and mounting as Type 1 wheels, definition 5.12.1.

Limitation: Coping wheels are recommended for use only on specially designed and fully guarded machines.

Figure: Slotting a block of marble to contour using a coping wheel



5.12.17 - TUCK POINTING WHEELS

Definition: Tuck pointing wheels, usually Type 1, reinforced organic bonded wheels have diameter, thickness and hole size dimension. They are subject to the same limitations of use and mounting as Type 1 wheels definition 5.12.1.

Limitation: Wheels used for tuck pointing should be reinforced, organic bonded.

Figure: Tuck pointing granite using a straight resinoid reinforced wheel

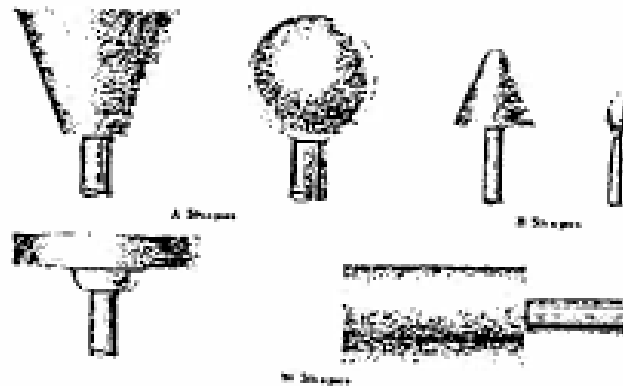


5.12.18 - MOUNTED WHEELS

Definition: Mounted wheels, usually 2" diameter or smaller, and of various shapes, may be either organic or inorganic bonded abrasive wheels. They are secured to plain or threaded steel mandrels.

Figure: Grinding wheels known as mounted wheels

Typical examples of grinding wheels known as mounted wheels.



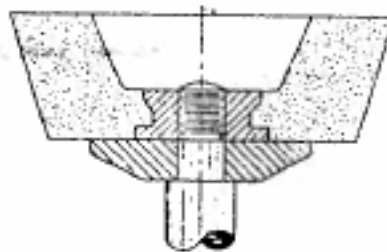
5.12.19 - THREADED HOLE CUP WHEELS

Definition: Threaded hole cup wheels Types 6 and 11 are designed for use on vertical, right angle head, or flexible shaft portable grinders. They have one central threaded bushing, securely anchored in place. They are mounted by being screwed onto a threaded machine spindle so that the wheel back seats firmly against an unrelieved flat back flange.

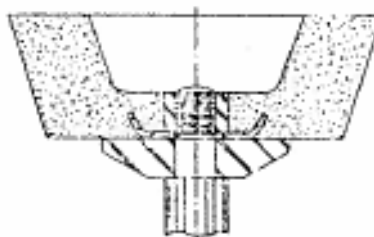
Limitation: Threaded hole cup wheel mounting should not be used with wheels larger than 6" diameter. Back flanges used in mounting threaded hole cup wheels shall be flat and unrelieved.

Figure: Cup wheels

A cup wheel with an inserted bushing. Note the bushing and abrasive are in uniform contact with the back flange.



A cup wheel with a prong anchor bushing. Note the bushing and abrasive are in uniform contact with the back flange.



5.12.20 - MODIFIED TYPES 6 & 11 WHEELS (TERRAZZO)

Definition: Some Type 6 and 11 cup wheels used in the terrazzo trade have tapered K dimensions to match a special tapered flange furnished by the machine builder.

Limitation: These wheels shall be mounted only with a special tapered flange.

Figure: Modified Types 6 and 11 wheels (terrazzo)

Typical examples of modified Types 6 and 11 wheels (terrazzo) showing tapered K dimensions.

