

# Abrasive Wheel Illustrations

Use with Machine Safety, Chapter 296-806 WAC

## Abrasive Wheel Illustrations - Wheel Types

This tool contains illustrations of:

- Some specific types of wheels used in this chapter
- General types of flanges used with abrasive wheels
- Mounting of some specific types of wheels
- Maximum exposure angles for safeguarding specific wheels.

Many of the illustrations include definitions to help familiarize you with this type of wheel.

### You will find these illustrations in this tool:

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Type 11 Wheel .....	R-11
Type 27 and 27A Wheels .....	R-12
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# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

**You will find illustrations of these maximum exposure angles in this tool:**

Bench, Pedestal, and Floorstand Grinders .....	R-23
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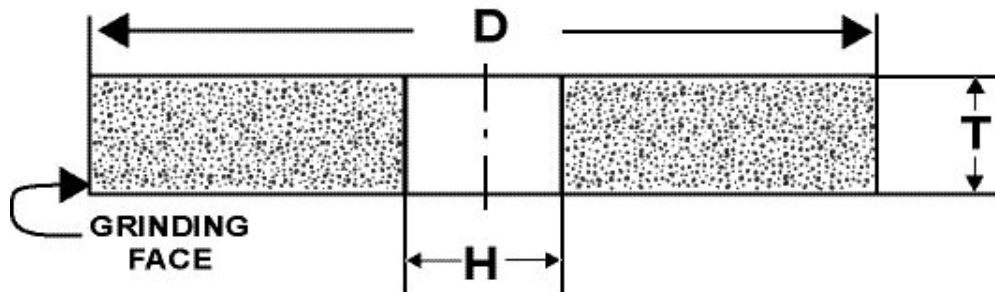
# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Type 1 wheel

An abrasive wheel that is shaped like a disc with a mounting hole in the middle. Sometimes called a "straight wheel." It has diameter (D), thickness (T), and hole size (H) dimensions. Grinding is normally done on the periphery (outside curve) of the wheel (T dimension).



TYPE 1 - STRAIGHT WHEELS

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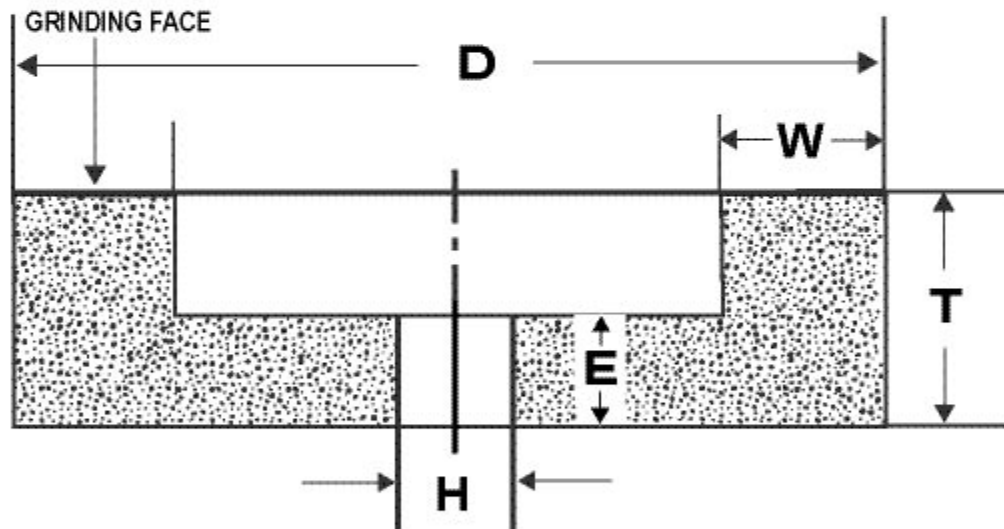
# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Type 6 wheel

An abrasive wheel that is shaped like a straight-sided cup or bowl with a mounting hole in the bottom of the cup. Sometimes called a "cup wheel." It has diameter (D), thickness (T), hole size (H), rim thickness (W), and back thickness (E) dimensions. Grinding is normally done on the cup rim (W dimension).



Type 6 Straight Cup Wheel

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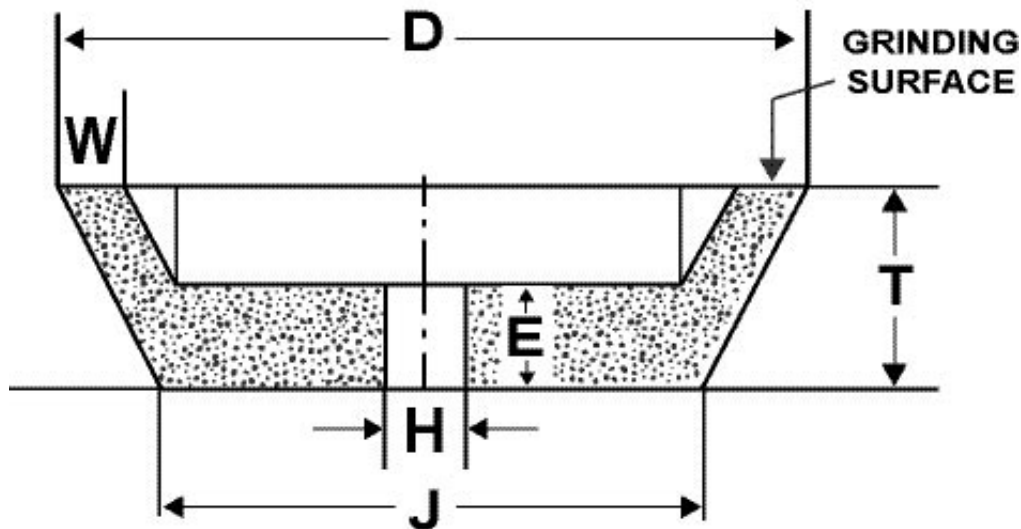
# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Type 11 wheel

An abrasive wheel that is shaped like a cup or bowl with a mounting hole in the bottom of the cup. The sides of the cup are not straight-sided but are angled outward. Sometimes called a "flaring cup wheel" since the sides are "flared" out. It has double diameter dimensions (top  $D$  and bottom  $J$ ). It also has thickness ( $T$ ), hole size ( $H$ ), rim thickness ( $W$ ) and back thickness ( $E$ ) dimensions. Grinding is normally done on the cup rim ( $W$  dimension).



**TYPE 11 - FLARING CUP WHEEL**

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# Abrasive Wheel Illustrations - Wheels

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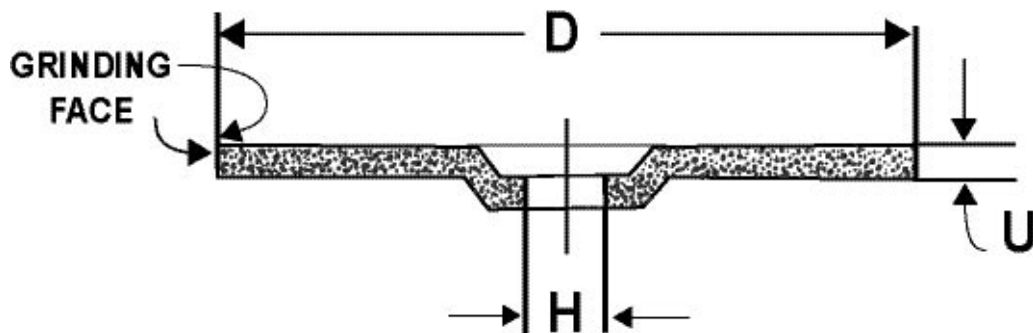
## Abrasive Wheel Illustrations - Wheel Types (continued)

### Type 27 wheel

An abrasive wheel that is similar to a Type 1 wheel, but the center of the wheel around the mounting hole is pushed back (depressed). Sometimes called a “depressed center” wheel. It has diameter (D), thickness (U) and hole size (H) dimensions. The depressed center allows grinding on the flat surface of the wheel without interference from the flange or mounting hardware.

### Type 27A cutting-off wheel

Similar to a Type 27 wheel. Specifically designed for use on cutting-off machines.



**Type 27 and 27A Wheels**



**Note:**

- Type 27 wheels are manufactured with flat grinding rims or faces and are designed for:
  - Side grinding when held at a slight angle to the workpiece
  - Peripheral grinding, including small cutting-off and shallow notching operations
- Type 27 wheels may be used flat when grinding masonry and concrete surfaces such as ceilings and walls.

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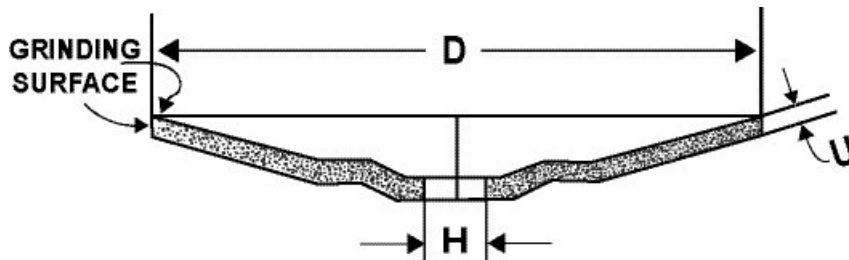
# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Type 28 wheel

An abrasive wheel that is similar to a Type 27 wheel, but the face of the wheel is angled upward and away from the mounting hole. The face of a Type 27 wheel is flat and perpendicular to the mounting hole. A Type 28 wheel is also called a "depressed center" wheel. It has diameter (D), thickness (U) and hole size (H) dimensions. The depressed center allow grinding without interference from the mounting. A Type 28 wheel has a saucer-shaped grinding rim and is designed for corner grinding and side grinding.



Type 28 Wheel

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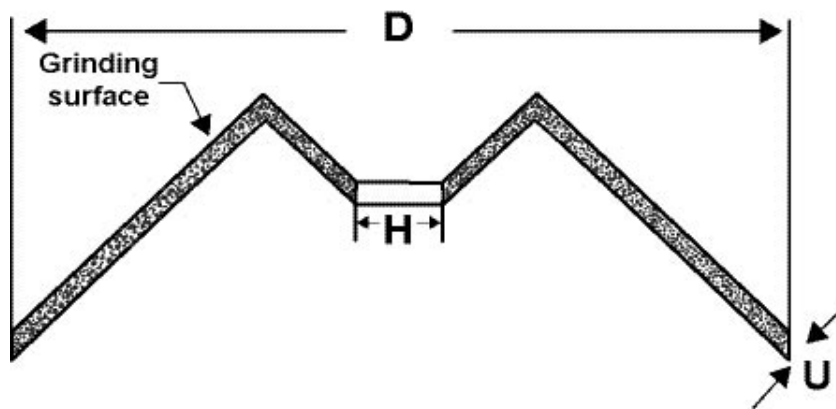
# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Type 29 wheel

An abrasive wheel that has reversed, saucer-shaped grinding rims (similar to a partially opened umbrella). It has diameter (D), thickness (U) and hole size (H) dimensions.



Type 29 Wheel

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# Abrasive Wheel Illustrations - Wheels

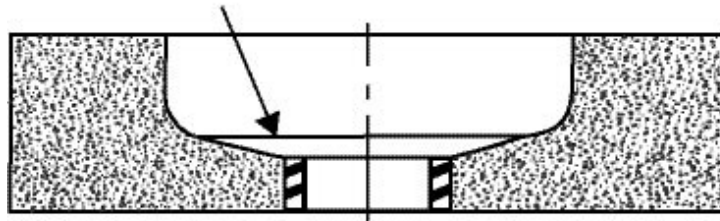
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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Modified Type 6 and 11 wheels (Terrazzo)

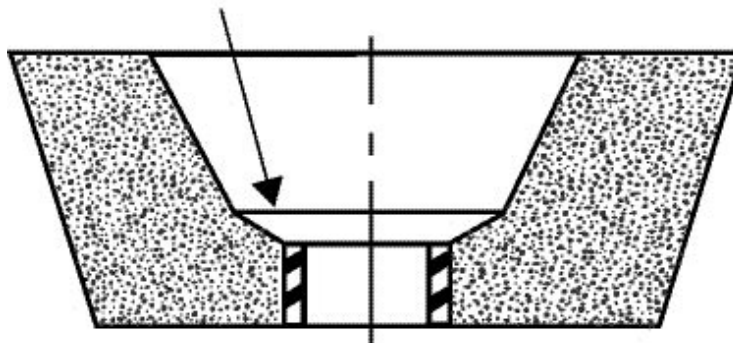
Similar to Type 6 "straight cup" wheels and Type 11 "flaring cup" wheels except for the bottom of the cup. The bottom of the cup is flat in Type 6 and 11 wheels. The modified wheels have bottoms that are sloped downwards towards the mounting hole. These modified wheels need to be mounted using a special tapered flange furnished by the tool manufacturer. These wheels are used in the terrazzo trade.

TAPERED "K" DIMENSION



TYPE 6 WHEEL (TERRAZZO)

TAPERED "K" DIMENSION



TYPE 11 WHEEL (TERRAZZO)

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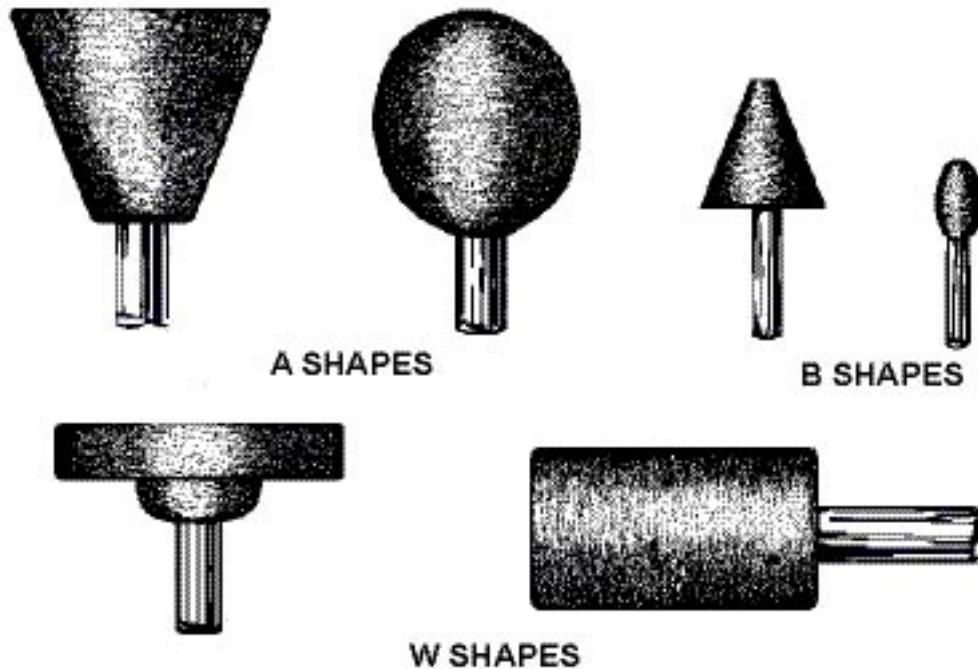
# Abrasive Wheel Illustrations - Wheels

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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Mounted wheels

Bonded abrasive wheels of various shapes, usually 2 inches diameter or smaller, that are secured to plain or threaded steel mandrels.



### MOUNTED WHEELS

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# Abrasive Wheel Illustrations - Flanges

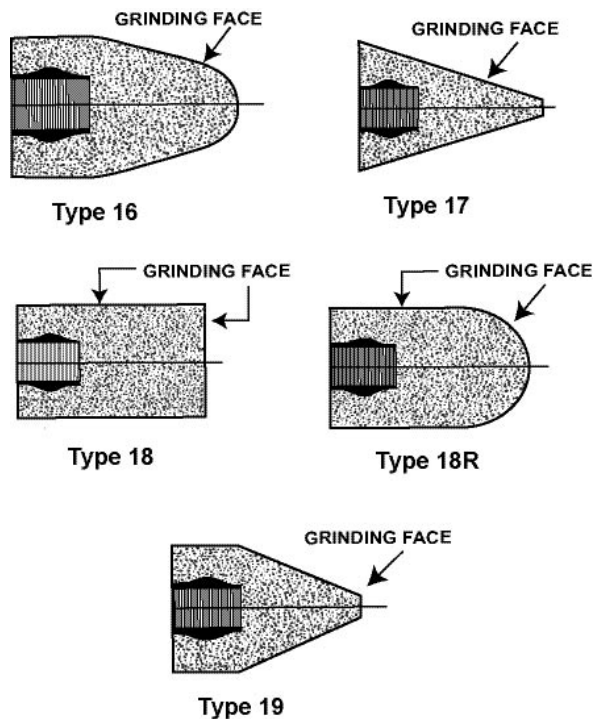
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## Abrasive Wheel Illustrations - Wheel Types (continued)

### Cone and plug wheels (Types 16, 17, 18, 18R, and 19)

Abrasive wheels manufactured with blind hole threaded bushings. They may be used on all surfaces except the flat mounting surface (D). Specific characteristics of the different cone and plug wheels are:

- Type 16 cone wheels have a curved side with a nose radius
- Type 17 cone wheels have straight sides with or without a nose radius
- Type 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 shapes



### Cone and Plug Wheels

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# Abrasive Wheel Illustrations - Flanges

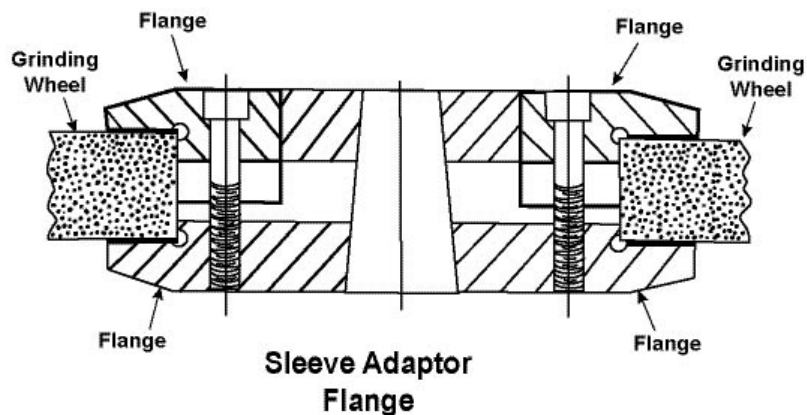
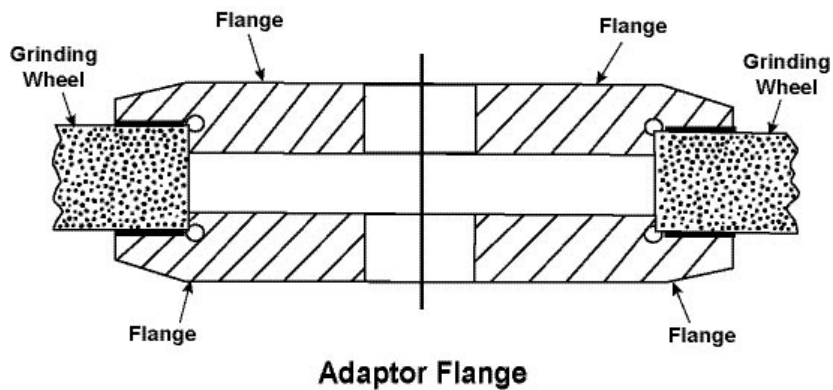
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## Abrasive Wheel Illustrations - Flanges

### Flanges

Collars, discs or plates between or against which wheels are mounted. There are four types of flanges:

- Adaptor
- Sleeve adaptor
- Straight relieved
- Straight unrelieved



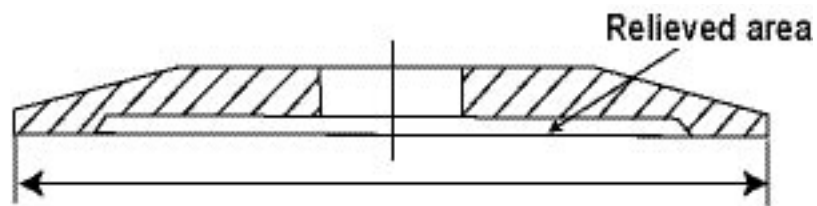
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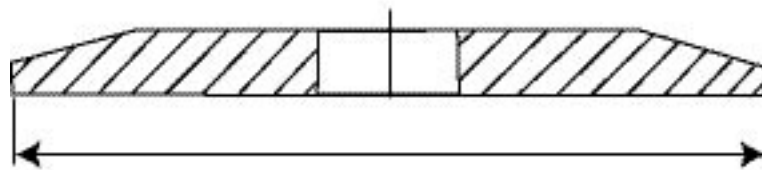
# Abrasive Wheel Illustrations - Flanges

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## Abrasive Wheel Illustrations - Flanges (continued)



**A Straight relieved flange**



**B Straight unrelieved flange**

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# Abrasive Wheel Illustrations - Flanges

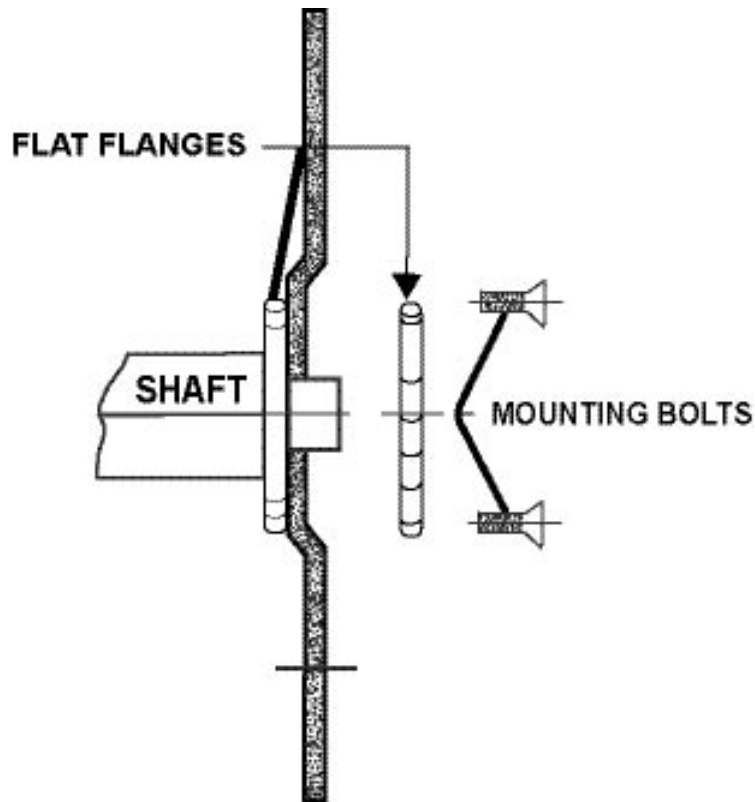
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## Abrasive Wheel Illustrations - Flanges (continued)

### Mounting Type 27A cutting-off wheels

Type 27A cutting-off wheels are mounted between flanges that are:

- Flat (unrelieved) with matching bearing surfaces  
**and**
- At least 1/4 the wheel diameter



Mounting Type 27A  
Cutting-off Wheels

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# Abrasive Wheel Illustrations - Flanges

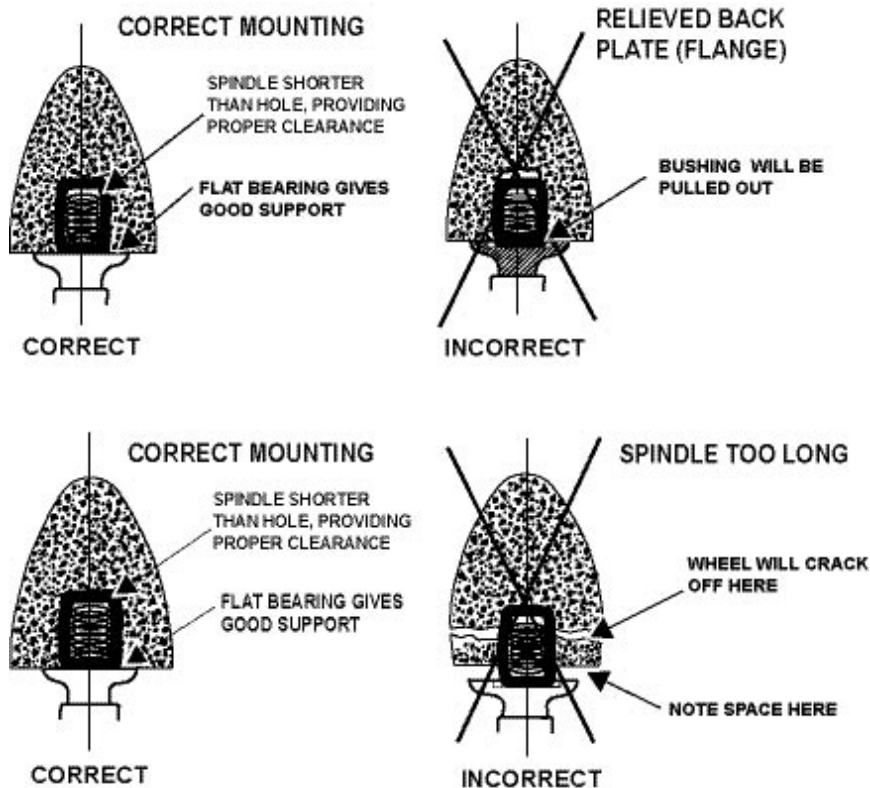
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(continued)

## Mounting threaded hole wheels

Threaded hole wheels are mounted against a back flange that is:

- Flat (unrelieved)
- Securely fastened and square to the spindle axis
- Able to properly support the wheel



# Abrasive Wheel Illustrations

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## Abrasive Wheel Illustrations – Maximum Exposure Angles

The following illustrations provide a visual reference for many of the guarding requirements for specific types of machines. Descriptions beneath the illustrations sometimes include specific application requirements.



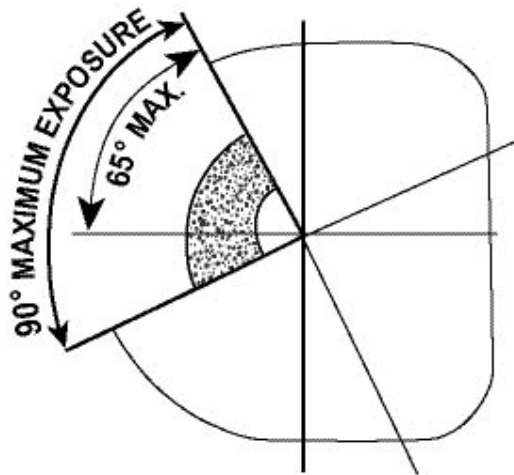
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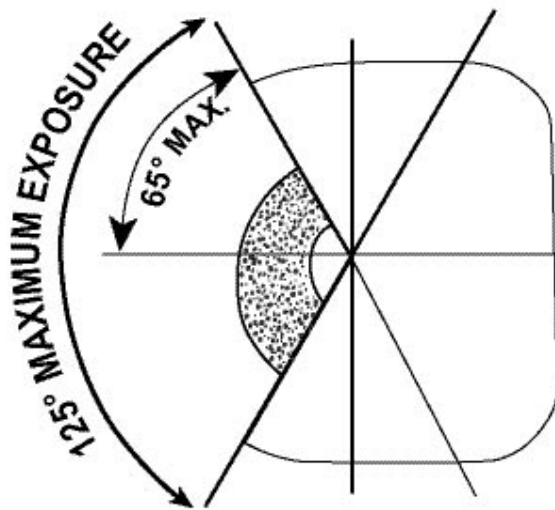
# Abrasive Wheel Illustrations

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## Abrasive Wheel Illustrations – Maximum Exposure Angles (continued)



Bench, pedestal, and floorstand grinders



Bench, pedestal, and floorstand grinders  
with contact below the level of the spindle

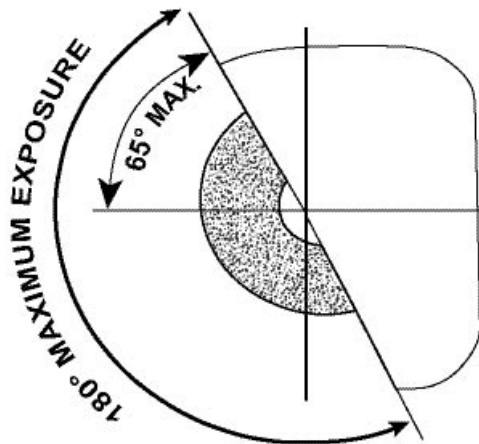
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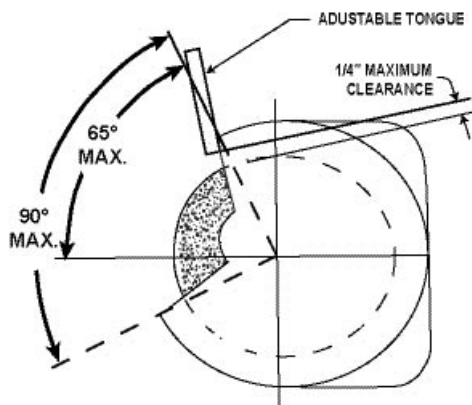
# Abrasive Wheel Illustrations

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## Abrasive Wheel Illustrations – Maximum Exposure Angles (continued)



Cylindrical grinder



Bench, pedestal, floorstand, and cylindrical grinder exposure angle adjustment

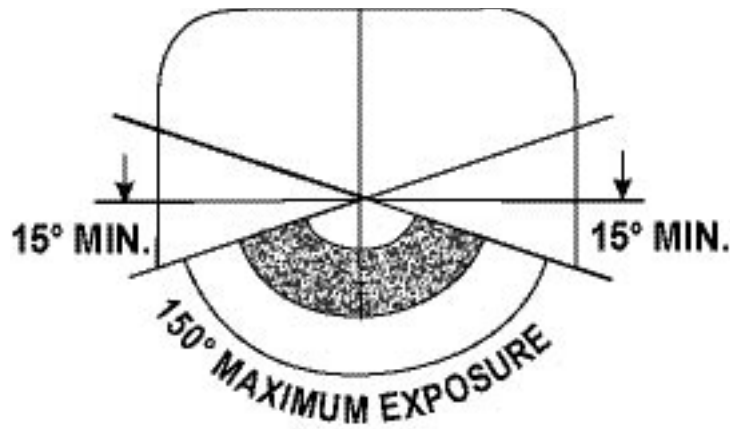
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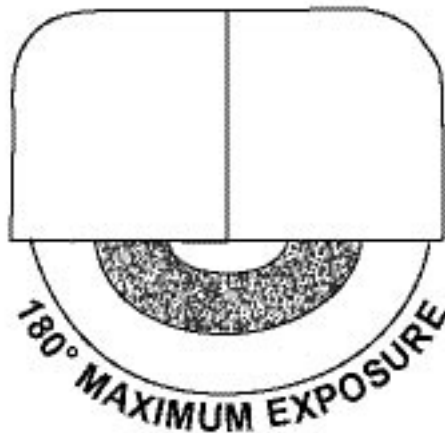
# Abrasive Wheel Illustrations

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## Abrasive Wheel Illustrations – Maximum Exposure Angles (continued)



Surface grinders and cutting-off machines



Swing frame grinders

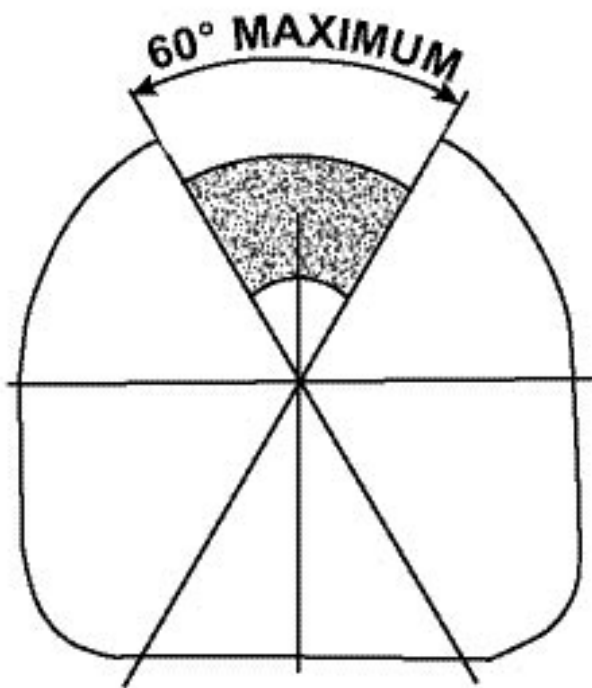
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# Abrasive Wheel Illustrations

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## Abrasive Wheel Illustrations – Maximum Exposure Angles (continued)



Top grinding