

How to select a wheel

Sak Abrasives

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A. Factors when selecting a grinding wheel

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A. Factors when selecting a grinding wheel

1. Material to be ground – type and hardness

- Material type
 - Steels → Aluminum Oxide
 - Low tensile strength materials and non-metallic materials → Silicon Carbide
- Material Hardness
 - Hard materials
 - Finer grit sizes
 - Friable adhesives
 - Softer grade wheels
 - Sharper abrasives
 - Soft materials
 - Coarse grit sizes
 - General purpose adhesives
 - Harder grade wheels

A. Factors when selecting a grinding wheel

2. Stock to be removed

- Light stock removal
 - Friable Grains
 - Finer Grit sizes
 - Softer grade wheels
- Heavy stock removal
 - Tougher Grains
 - Coarser Grit sizes
 - Harder grade wheels

A. Factors when selecting a grinding wheel

3. Workpiece Geometry and Surface Finish

Workpiece Geometry

- Flat/Uninterrupted surface (no form)
 - Finer Grit sizes
 - Softer grade wheels
 - Open Structures
- Heavy stock removal
 - Coarser Grit sizes
 - Harder grade wheels
 - Tighter Structures

Surface Finish required

- Better finish
 - Finer Grit sizes
 - Harder grade wheels
 - Less friable abrasives
- Worse finish
 - Coarser Grit sizes
 - Softer grade wheels
 - More friable abrasives

A. Factors when selecting a grinding wheel

4. Grinding machine horsepower

- Higher horsepower
 - Harder grade wheels
 - Tougher abrasives
- Lower horsepower
 - Softer grade wheels
 - Friable abrasives

A. Factors when selecting a grinding wheel

5. Wheel speeds and feeds

- Faster wheel surface feet per minute
 - Softer grade wheels
- Faster wheel surface feet per minute
 - Harder grade wheels

A. Factors when selecting a grinding wheel

6. Grinding contact area

- Large contact area
 - Softer grade wheels
 - Coarser grit size
 - Friable adhesives

- Small contact area
 - Harder grade wheels
 - Finer grit size
 - Tougher abrasives

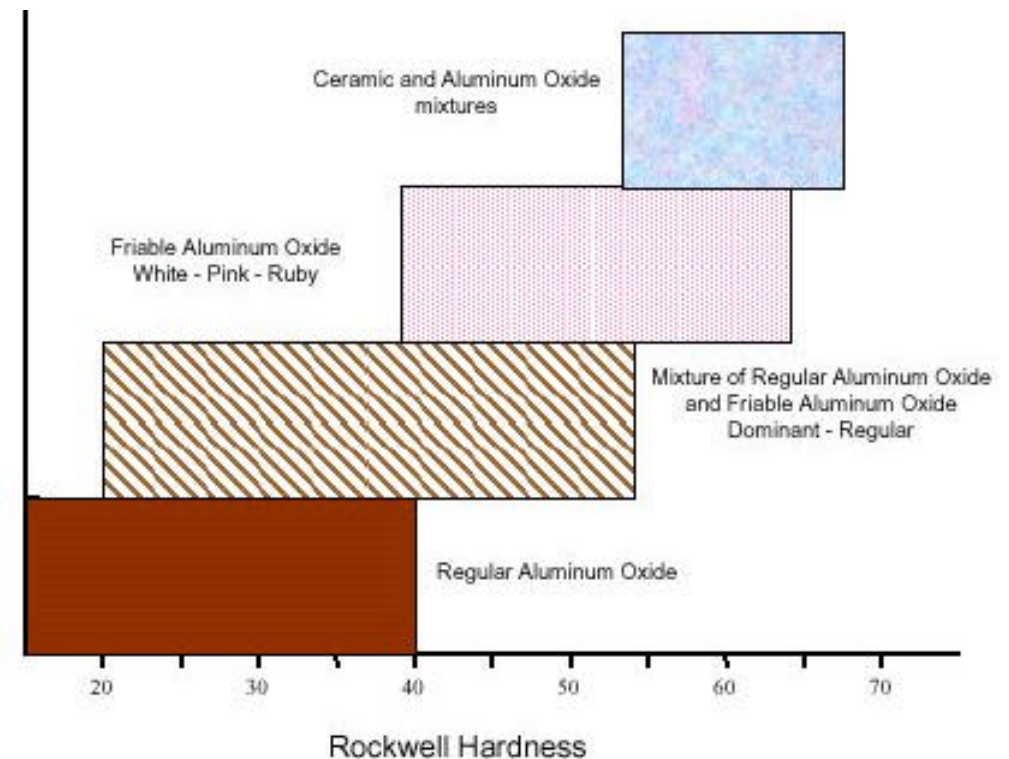
A. Factors when selecting a grinding wheel

7. Grinding fluid – wet or dry

- Wet Applications
 - Harder grade wheels
 - Tougher abrasives
 - Open structures
- Dry Applications
 - Softer grade wheels
 - Friable adhesives
 - Tighter structures

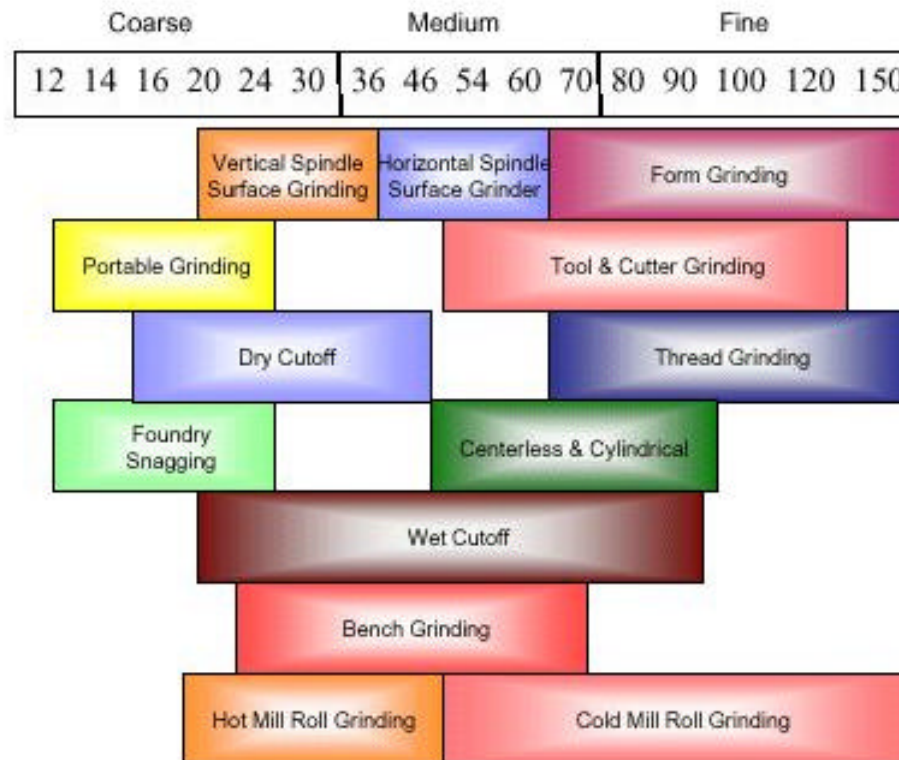
B. Abrasive Grain and Grit Size selection

- Abrasive selection depends on workpiece and hardness
- Above 40Rc, there are several candidate abrasives.
- Mixed regular and friable aluminum oxide and friable aluminum oxide are popular upto 58Rc.
- Above 58Rc, friable aluminum oxides are popular



B. Abrasive Grain and Grit Size selection

- Grit Size Selection: Different grit sizes are appropriate for different applications



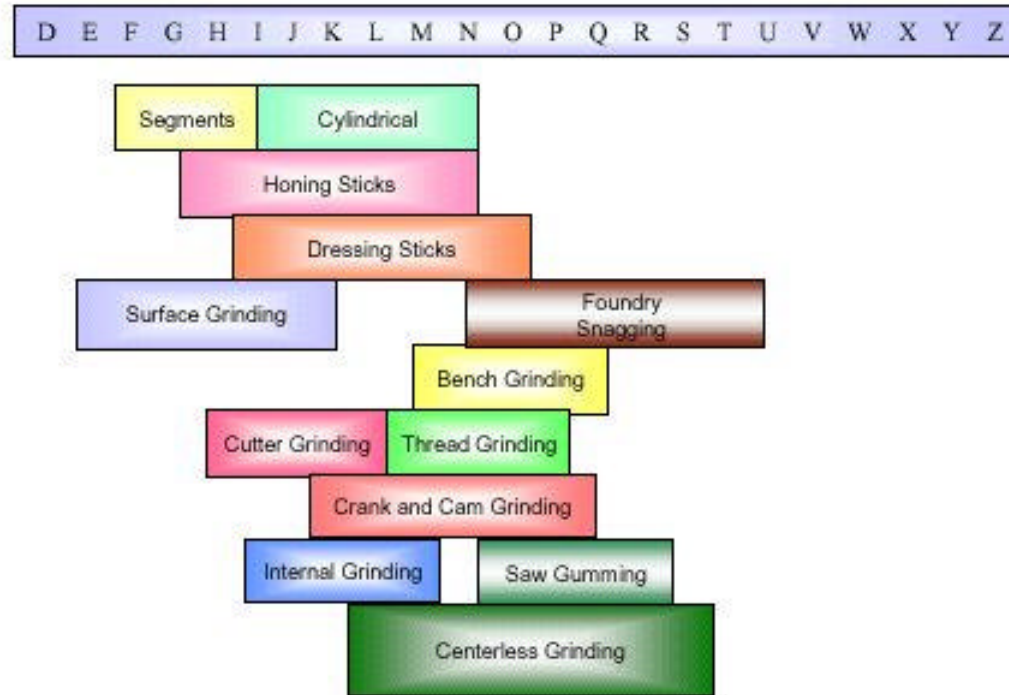
- Use Coarse Grit
 - Rapid stock removal
 - Large areas of contact
 - When finish is not important
 - Soft, ductile materials
- Use Fine Grit
 - When form holding is needed
 - Small areas of contact
 - Fine finish
 - Hard, brittle materials

B. Abrasive Grain and Grit Size selection

- Hold Radius for different types of grit sizes and finish

Grit Size	46	54	60	80	100	120	150	220
Finish (RMS)	Over 32	20 - 32	15 - 20	12 - 18	10 - 15	8 - 12	6 - 10	5 - 6
Radius	Over .020	.017 - .020	.016 - .020	.010 - .020	.008 - .010	.006 - .008	.004 - .006	.003 - .005

C. Wheel Grade Selection



D. Structure Selection

- Closed structure
 - Form holding
 - Tool and Cutter sharpening
- Open structure
 - Surface grinding
 - Cylindrical grinding
- Induced Porosity
 - Surface Grinding
 - Blanchard grinding (segments/cylinders)
 - Heat sensitive parts

End of Presentation