

# **Abrasives**

**Woodworkers of SE Texas  
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- An **abrasive** is a material, often a mineral, that is used to shape or finish a workpiece through rubbing which leads to part of the workpiece being worn away by friction.

—Wikipedia

# Program Topics

- Minerals for Abrasives
- Abrasive Products Used by Woodworkers
- Sandpapers: Composition, Backing, Grit
- Numbers & Loading
- Open-closed Coat
- Uses for Abrasives
- Bonding
- New Sandpaper Products
- Polishing Powders
- Uses for Abrasives

# Minerals Used for Abrasives

- Natural Materials
  - Emery
  - Garnet
  - Flint
  - Crocus
- Manufactured Materials {Furnace}
  - Aluminum oxide
  - Silicon carbide
  - Alumina zirconia and other ceramics

# Abrasive Products Used by Woodworkers

Abrasive materials listed on previous slide are used to make the following sanding products for woodworkers

## – Sandpapers

- Composition
- Properties

## – Powders & Powder Replacements

*Note: Files, rasps, steel wool--all use a cutting action rather than a rubbing action and are not considered abrasives.*

# Sandpaper Composition

- Backing
- Grit
- Bonding
- Coating

# Sandpaper Backing

- Paper – Sheets – Paper Weight from A-F
- For power tools — Grades C, D, E, F
- Cloth — for machinery that uses belts, rolls, and strips — 3 grades J, X, Y
- Fiber – heaviest papers laminations - Belts
- New Products

# Color Indicates Product/Grit

- Sandpaper Color = Grit type.
- Orange = Garnet
- Tan = Aluminum oxide
- Black = Silicone carbide
- Gray or gold = “Coated” = Aluminum oxide  
or Silicone carbide



# Grits

- Grit does the work for sandpaper.
- It is a uniform size on each sheet
- Traditional minerals = garnet, aluminum oxide, or silicone oxide.
- New products = ceramics or synthetics

# Grit selection affects results

- Garnet= crystals
- Aluminum oxide= pyramid crystals
- Silicone oxide = slender pointed crystals with a narrow body
- Alumina zirconia = aluminum oxide matrix of zirconia

# Grit size

- Sieved grit assigned a number based on number of holes per linear inch
- The larger the grit number, the smaller the grit particle, and the finer the sanding finish.

# Sandpaper Numbers

- Two different numbering systems:
  - US: CAMI [Coated Abrasives Manufacturing Institute]
  - Europe: FEPA [Federation of European Producers, Assoc.]
- Sandpapers from FEPA have a P in front of their grit size, as in P220

# Loading

- Sanding dust reduces sandpaper efficiency
- Results in loading
- Stearate additive affects loading
- Grit spacing reduces loading

# Grit Distribution

- Distribution of grit across the surface of the backing affects sanding dust dispersion.
- Closed coat
- Open coat

# Bonding

- Animal glue
- Phenolic resins

# New Sanding Products

- Poly “threads” coated with grit
- Hand sanding with “dust channeling.”



# Power Sanding Attachments

- New power tool attachments with matching sandpaper attached with PSA or Hook & Loop
- More expensive, but they last longer than traditional sandpaper and work faster.

# Polishing Powders

- Rubbing out
- High gloss sanding

# Uses for Abrasives

- Preparing Raw Surfaces
- Repairing and cleaning
- Removing old finishes
- Smoothing between finish coats
- Rubbing out

# Grits for Specific Wood Sanding Tasks

- Preparing Rough Sawn Surfaces.
- Be aware that grits higher than 220 will begin polishing/burnishing a sanded wood surface.
- Do not skip more than one grit level if your sanding project requires several levels of grit to complete

# Benefits of New Technology

With the continuing development of new technology and new products, we as woodworkers receive the benefits.

- We don't have to sand as long to get the same results
- We don't have to change to new sandpaper as often.

# Bibliography

- The following sources were used to prepare this presentation:
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- Flexnor, Bob. Understanding Wood Finishing. Revised & updated. Fox Chapel Publishing, 2005
- <https://wikipedia.org> search for "Abrasives"
- <https://klingspor.com> choose Reference Desk – much information there
- Catalogs from the following vendors:
  - Hartville Tool Master Catalog
  - Rockler Woodworking and Hardware
  - Woodcraft
  - Peachtree Woodworking Supply, Inc.