

What Makes Up a Quality Sanding Abrasive?

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What Makes Up a Sanding Abrasive?

3 Main Components

- Backing
- Adhesive
- Type of Abrasive

Abrasive Backings

- There are many variables!!!

- Paper

- Cloth

- Foam

- Film

How Backing is Graded

- All Abrasive Backing is Graded
- The Higher the Letter the Stiffer the Backing.
- Grading Scale is A Weight Through Y Weight.
- For example Grade A is Very Thin.
- Graded X is Heaviest and Most Popular for Belt Applications

Paper Backing Examples

■ Paper (Code) g/m ² App		
■ A < 85 h	=	Fine Hand Sanding
■ B 86 -110	=	Hand Sanding
■ C 111 -135	=	Hand Sanding Portable
■ D 136 - 220	=	Portable Sanding Machines
■ E 221 - 270	=	Machine Sanding Light Wide Belt
■ F 271 – 350	=	Machine Sanding Segment Belts
■ G 351 - 500	=	Machine Sanding Segment Belts
■ H > 500	=	Machine Sanding Segment Belts

Cloth Backings

■ Characteristic

■ Cloth

- H stretchable
- JJ highly flexible
- J flexible
- X stiff / hard
- Y polyester hard
- Z reinforced weft

■ Application

- Profile sanding
Contour, Fine Sanding
- Contour Sanding
- High Performance Sanding
- High Perform Power Sanding
- For Segmented Wide
Belt

Cloth Backing Types

Cotton Backing

- Most popular material used
- Cotton backed belts run cooler.
- Cotton backing will stretch if wet.
- Cost less

Cloth Backing Types

Cotton Polyester Backing

- Very strong stiff backing.
- Cotton Polyester backing generates more heat.
- Waterproof for wet applications.
- More Expensive

Adhesives

2 Main Adhesives

- Resin over Resin
- Urea (Animal Fat)

Resin over Resin

- Very Durable
- Heat and Moisture Resistant
- Best for Woodturning Applications.

UREA

- Paper Application Mostly Sheets
- Made of Animal Fat Derived From Animal Hide
- Not Recommended for Woodturning Applications

Grit Distribution

2 Types

There are 2 ways in which grit is distributed on a backing surface.

Grit Distribution

- Open Grit Distribution
- Closed Grit Distribution

Open Grit Distribution

- The grits are distributed with a defined distance and cover about 50% the surface.

Advantages:

- Less clogging due to more free space between the grits.

Application:

- Great for dry sanding on soft and clogging materials (soft wood, filler , paint lacquer)

Closed Grit Distribution

- The grits are distributed adjoining one another COVERING up to 100% of the surface.

Advantages:

- More cutting edges in action, more stock removal, longer life, less scratch depth

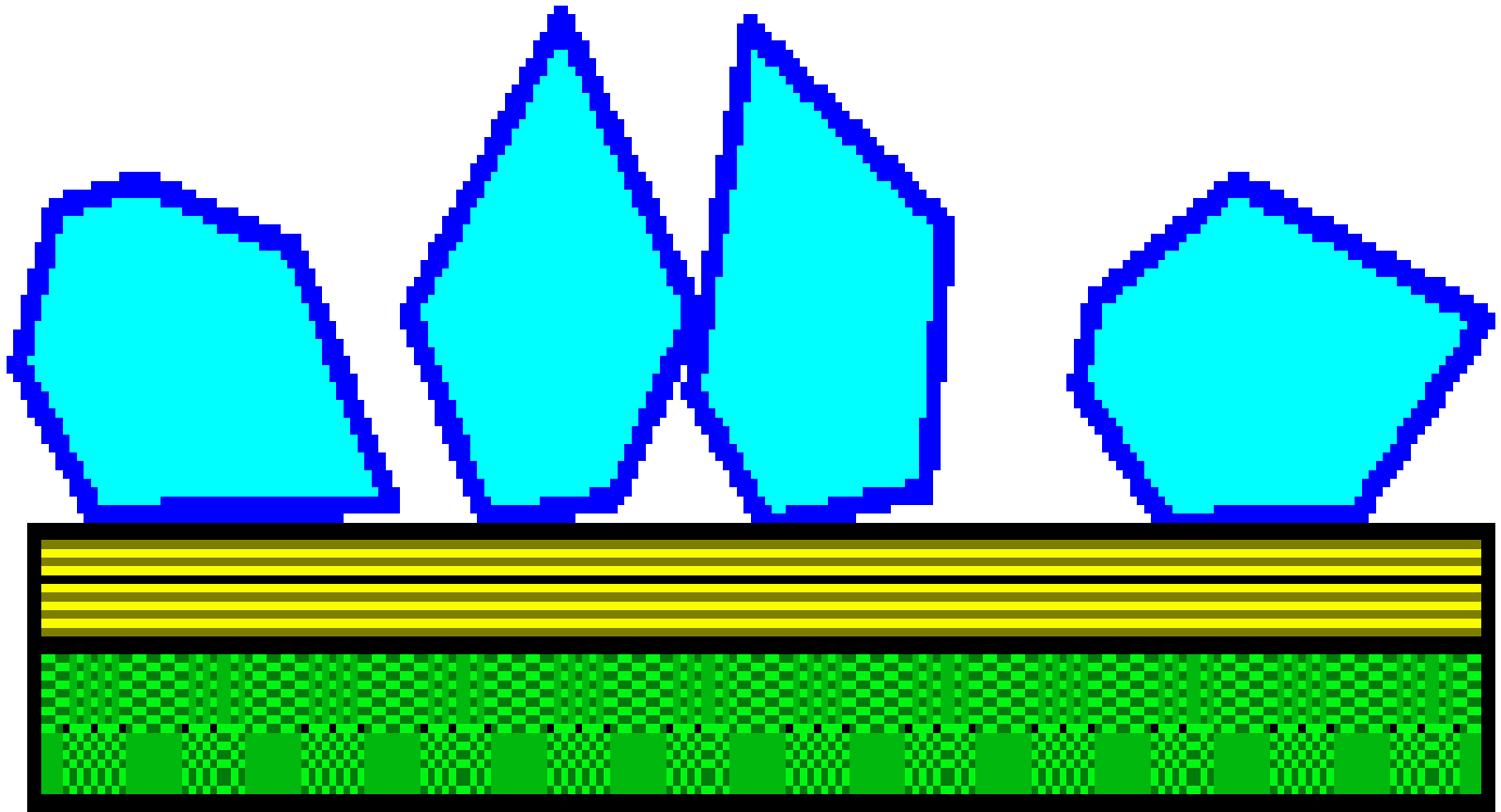
Application:

- On Hard, non-clogging materials,
- Better for wet sanding

How are the Grits Spread on the Backing Surface?

- *Mechanically through Gravity*
- *Electrostatically*

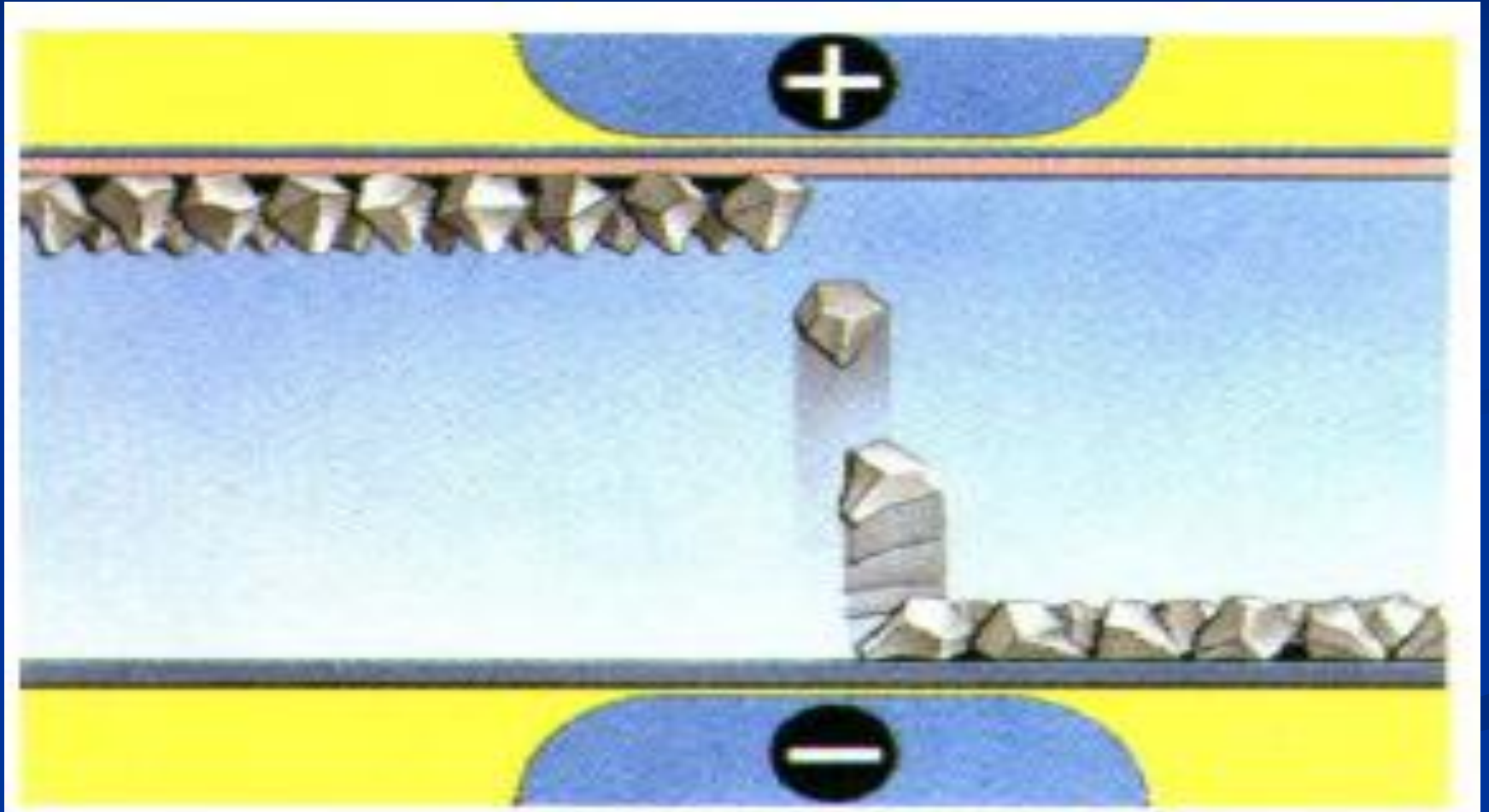
Mechanically Through Gravity



Mechanically Through Gravity

- The grits fall by force of gravity on the coated backing. The grits lie accidental surface.
- Mechanically coated abrasives are less aggressive.
- The least expensive, and lowest quality manufacturing process.

Electrostatically



Electrostatically

- The grits become statically charge attracted to the oncoming, base coated backing.
- In the magnetic field the grits adjust and hit the coated backing vertically in the longitudinal axis.
- Electrostatically coated abrasives are more aggressive and achieve a higher sanding performance than mechanically coated abrasives.

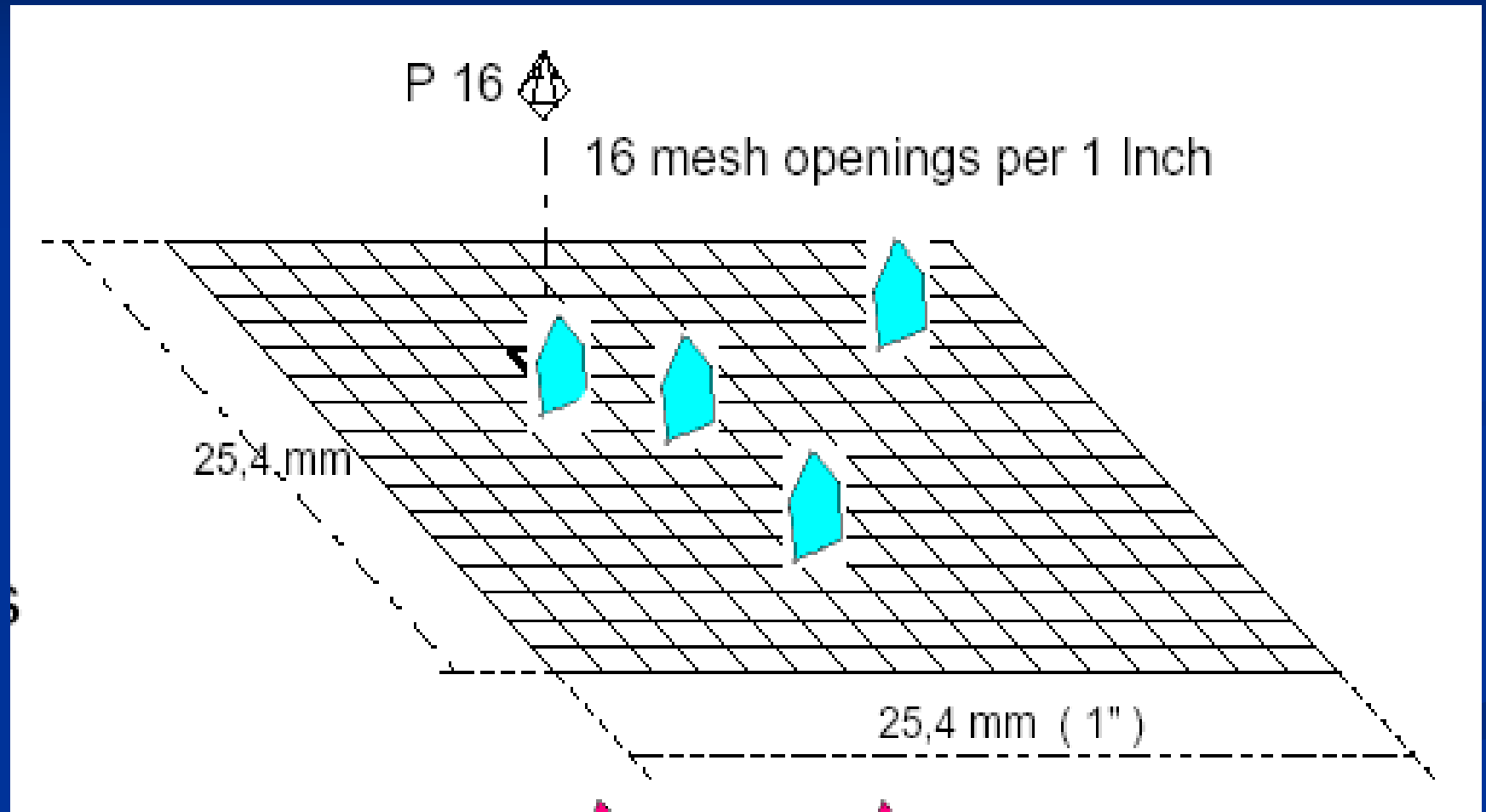
Stearate Coating

- The additional stearate coat reduces clogging of the abrasive. It is applied after the size coat. The color can vary different products for products.
- Abrasives with stearate are used to sand lacquer and resinous wood.

Grit Standards

- World-wide there are 3 different important grit standards
- The first is CAMI which is the USA standard.
- The second is FEPA in Europe better known as P standard. Most common used today.
- FEPA: Federation Européenne des fab
- = Federation of European Manufacturers
- Its standards are in use mostly today.
- The Third is JIS in Japan.

Grain Cutting Size



Grain Cutting Size

- A grain number stands for the grit size. The grain number corresponds to the mesh openings per 1 Inch.
- For Example 1 Inch = 25.4 mm

Grain Cutting Size

Grit norms FEPA - P			
Grit number	Average diameter	Grit number	Average diameter
P	$1\text{ }\mu\text{m} = 1/1000\text{ mm}$	P	$1\text{ }\mu\text{m} = 1/1000\text{ mm}$
240	60	800	21.8
280	52.2	1000	18.3
320	46.2	1200	15.3
360	40.5	1500	12.6
400	35	2000	10.3
500	30	2500	8.4
600	25.6		

Grain Hardness

- The Mohs scale of hardness measures sequence of hardness!!!!


Grain Hardness

- What is the Hardest Grain on Mohs Scale???????
- What is the Softest Grain on Mohs Scale???????

Grain Hardness

- Diamonds are the hardest grain on the Mohs Scale!!
- Talcum is the softest grain on the Mohs scale!!!!
- As the grain becomes harder it also becomes more brittle!

Grain Hardness

Abrasives grain		Mohs' Hardness	Toughness	Application
natural	Ruby (Garnet)	7.0 - 7.5		Wood, hand sanding
	Emery	7.5 - 8.0		Fine sanding & polishing of metal, jewellery
synthetic	Zirconia Alumina	9		Mineral fibre boards, steel
	Ceramic	9		High alloyed steels
	Aluminum Oxide	9.2		Wood, Plywood, metal, lacquer, paint
	Silicon Carbide	9.3 - 9.7		MDF- & Particle boards, glass, slate, marble
	Diamond	10		Special application

Toughness is reduced with increasing hardness

Abrasives Grains

- Aluminum Oxide
 - Brown colored synthetic mineral. Tough abrasive grain.
 - Applications: Most popular grain for general grinding/sanding and finishing.

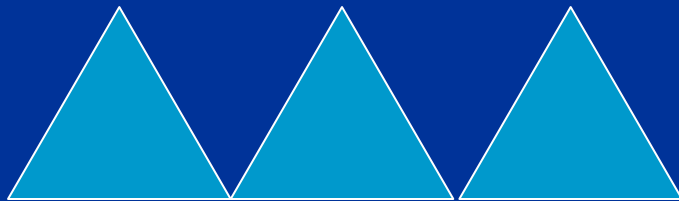
Abrasives Grains

■ Silicon Carbide

- Shiny, black, sharp, very hard mineral
- Applications: Very tough grain used finishing glass, stone, and ferrous metals, etc...

Abrasives Grains

■ Non Worn Silicon Carbide



■ Worn Silicon Carbide



Grain Structure

- Aluminum Oxide is not as brittle and becomes more rounded as it wears.

Cost Structure

- 18% = Abrasive Grain
- 15% = Coatings
- 67% = Backing Cost
- 100% = Cost

Finishing Steps

MATTE	SEMI GLOSS	HIGH GLOSS
5 MM ORBIT SANDER 1/8" WHITE INNERFACE + 150 BLUE OR 100 MICRON 220 BLUE OR 60 MICRON	5 MM ORBIT SANDER 1/8" WHITE INNERFACE + 150 BLUE OR 100 MICRON 220 BLUE OR 60 MICRON	5 MM ORBIT SANDER 1/8" WHITE INNERFACE + 150 BLUE OR 100 MICRON 220 BLUE OR 60 MICRON
3 MM ORBIT SANDER 1/2" GRAY INNERFACE + 320 BLUE OR 30 MICRON MAROON SCUFF BUFF	3 MM ORBIT SANDER 1/2" GRAY INNERFACE + 320 BLUE OR 30 MICRON GRAY SCUFF BUFF	3 MM ORBIT SANDER 1/2" GRAY INNERFACE + 320 BLUE OR 30 MICRON 400 BLUE 600 BLUE GRAY SCUFF BUFF

Thank you for your Attention!!

Questions??

As always call if you have any questions!

Vince

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