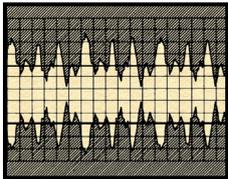


Abrasives and you - clues to help you choose

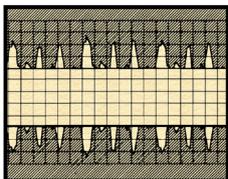
If you've ever puzzled what to use, here's a quick rundown to help you

Let's Start with the main types

For the average user, the names of the two main abrasives are Aluminium Oxide and Silicon Carbide. Now because many of our readers are largely interested in Flex-Hone use, we'll explain a basic difference in the way abrasives work in things like grinding wheels in contrast to Flex-Hones. Let's call grinding wheels "upwards cutting" tools and Flex-Hones "downwards smoothing" tools. By "upwards cutting" we mean each grain of abrasive is like a tiny, sharp lathe tool. It digs down under the surface and lifts metal off the workpiece. Flex-Hones work differently. They smooth over the top of the surface and gently flatten the tiny sharp peaks left by machining or grinding. The diagrams below show the result. We'll come back to this later.



Typical sharp roughness readout for grinding or machining finish



Roughness readout for "downwards" smoothed Flex-Hone finish which we call a "plateaued" finish.

Terms and general things to know

The way an abrasive will cut depends on a few characteristics - mainly:

1. Hardness (technically measured by the "Moh" scale. The bigger the Moh number, the harder the abrasive).
2. Shape and Size.
3. How easily and quickly each grain of abrasive breaks up into smaller particles after it hits the surface of the grinding job. This is called "friability".
4. Bonding of the abrasive grains

Common types of abrasive are:

Silicon Carbide

Is just below diamond for hardness and more aggressive than Aluminium Oxide (AO). The particle shape is a bit sharper too, and the grains do not break up as easily as AO. In grinding wheel type operations it removes metal quicker and leaves a "rougner" finish than AO. **In Flex-Hones** silicon carbide is the usual general abrasive choice because its greater hardness knocks the tops off "sharpies" quicker and better for most materials. Because of the "downwards smoothing" action of a Flex-Hone, the finished profile is smooth [exactly the opposite to Silicon Carbide in a grinding wheel]. We call the finish left after Flex-Honing a "plateaued" finish - see the roughness readout pictures in the left column.



Grains of Silicon Carbide
Look like this

Aluminium Oxide

This abrasive is very slightly softer than silicon carbide but more "friable" i.e. in use it breaks down into smaller particles quicker than silicon carbide. In grinding wheel operations it is the most commonly used abrasive because it has a high metal removal rate but gives a smoother finish than silicon carbide because of its shape and "friability". **In Flex-Hones** aluminium oxide is generally used on plated surfaces such as nikasil or chrome plated cylinders. The reason is its more "block like" shape and its better breakdown [friability] means aluminium oxide is less likely to cut through the plating and lift pieces off the cylinder wall.



Grains of aluminium oxide look like this

Grit size & controlling cut using Flex-Hones

Grit size and finish when you're using Flex-Hones is not at all comparable with the finish that a particular grit in a grinding wheel or belt will give. At a given grit size [say 180 grit] a grinding wheel will give a fairly coarse looking finish but a Flex-Hone in 180 grit will give you quite a fine finish. And, here's a tip - no matter what the nominal grit of the Flex-Hone, you can vary the fineness of finish just by using a heavier cutting medium. For instance if you smear a bore with heavy grease you will get a lot finer finish than if you use 30 grade oil to "lubricate" the Flex-Hone. And . . . while we're on this subject **NEVER** use kerosene or a light weight solvent when Flex-Honing. These mediums do two things. They make the Flex-Hone wear much quicker and they leave abrasive particles embedded in the pores of the metal.

Deburring an abrasive's daily grind!

Metal machining usually leaves burrs that are a pain to clean up. Great weapons to beat burrs are **Flex-Hones** for internal burr removal and it's sister tool **NamPower** impregnated filament abrasive brushes for external burr removal.



Flex-Hone NamPower Abrasive Brushes

Finally the Super Abrasives

Boron nitride (almost as hard as diamond) and **Diamond** are known as the "Super Abrasives". They're expensive and only used on very hard materials.

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