

*Joe's Place, by
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An Introduction to Paint, Painting and Equipment - Part III

Many times I have heard folks say, "Ah, sandpaper is sandpaper, what's the difference?" Well, that may be somewhat true, if you are only concerned with making a nice pine birdhouse, paper towel holder or a magazine rack for your wife's birthday, but *SK* is not about woodworking, so that viewpoint doesn't apply here.

There is a broad difference in abrasive papers specifically used in automotive painting, and not knowing the difference can result in a lot of aggravation and great disappointment when doing an automotive paint project. What we are going to try, in this month's article, is to make some sense of the confusing array of abrasive papers available today. Essentially, most of it is hard, sharp abrasive material, usually aluminum oxide or silicon carbide, bonded to a specialized paper backing with waterproof resins and adhesives; however it comes in many shapes, sizes, methods of attachment and grit.

Grit, of course, is a standardized method of grading the size of the minute particles stuck on the paper. The higher the grit number, the finer the abrasive particle. A 180 grit will be much coarser than 400

grit, and a 1000 grit will be much, much finer than a 400. In determining a grit size for abrasive paper, the manufacturer will allow up to that particular size particle



but nothing larger to be applied to the backing. This ensures that the particular size scratches made by

a particle are all of one size and smaller.

Scratches? Yes, that is essentially what the abrasive paper is doing, by using literally thousands of hard, sharp particles with the help of friction to wear away a surface: either in paint removal with some of the coarser grits like P80 or P120, or with finer grits like a P320 or P400 on bare metal and/or primer in prepping for paint. It is also always helpful to envision that each successively finer grade of abrasive paper is simply 'wearing away' the coarser scratches made by the coarser grit used before it. This is why final 'wet' or 'color sanding' is done over the final clear coat or other finish painted surface with a P1000 or even P1500 grit paper leaving a glass-smooth surface. Under a microscope you would still see sanding scratches, but to the eye it would look perfectly smooth.



*Sanding scratches (side view)
get progressively smaller as
finer grit paper is used.*

While on the subject of grit, one other very important item worth noting is that there is actually more than one grading system for abrasive paper grits. In the U.S., the two most commonly seen grit rating systems are the US CAMI (Coated Abrasive Manufacturers Institute) usually expressed in a plain number such as 400 and the other, the European FEPA (Federation of European Producers of Abrasives) 'P' grade systems preceded with a 'P' as in P400. It can be rather confusing as both systems are nearly identical in particle size in the coarser grits such as 80 or 180; however at around 400 as the grits get fine; the variation between the rating systems

gets wider. To make the issue even more confusing, many suppliers today only offer the 'P' graded paper; and have dropped the leading 'P' in their product descriptions. This is very important! Keep this mind when buying abrasive paper. If you aren't sure, just ask about what you are getting before you buy. Oh, and quality...you usually get what you pay for in buying abrasive paper. Don't cut corners here.

The table below is useful for determining the proper grit size for a particular application and helps to better explain the variation between systems.

Abrasive Paper Grit Size Table

µm - Micron or micrometer -A unit of length equal to one millionth of a meter

Extra Coarse - Macrogrits (rarely used in automotive painting)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
P12	1815
P16	1324
P20	1000
P24	764
24	708
P30	642
30	632
36	530
P36	538

Coarse (rapid removal of old finish and filler, also shaping of fillers)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
P40	425
40	425
P50	336
50	348

Medium (sanding bare metal in preparation for finishing, for gentle removal of old finish)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
P60	269
60	265
P80	201
80	190

Fine (sanding bare metal in preparation for finishing)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
P100	162
100	140
P120	125
120	115

Very Fine (sanding of bare metal before primer)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
P150	100
150	92
P180	82
180	82
P220	68
220	68

Very Fine - Microgrits (sanding sealer/filler primer before final primer)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
P240	58.5
240	53.0
P280	52.2
P320	46.2
P360	40.5

Extra Fine (sanding of primer before finishing)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
320	36.0
P400	35.0
P500	30.2
360	28.0
P600	25.8

Super Fine (initial wet-sanding or 'color-sanding' of final finishes)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
400	23.0
P800	21.8
500	20.0
P1000	18.3
600	16.0
P1200	15.3

Ultra fine (final wet-sanding or 'color-sanding' and polishing for mirror like finish)

ISO/FEPA Grit designation	Average particle diameter (µm)
US CAMI Grit designation	
800	12.6
P1500	12.6
1000	10.3
P2000	10.3
P2500	8.4

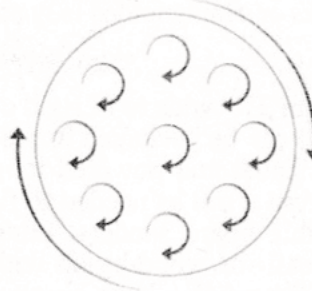
people will prefer one over the other, and each will do a perfect job. If you are planning a paint job in the future pick up a few good books and DVDs on surface prep (there are a lot of valuable tips that the experts can pass along to you), do your homework to see what is available today in sanding equipment. If it's possible, try out different methods and tools to see what feels best for you.

With this month's feature, I hope I have cleared up some confusion surrounding the subject of 'abrasive paper.' As always, at *SK*, we welcome any questions or comments on your experiences.

Next month we will look into the world of paint guns and related equipment.



Power sanders include electric and pneumatic, orbital, rotary, dual-action (left) and straight-line (above) machines.



This diagram shows the working action the pad makes on a dual-action sander. It both orbits (small random circle action) and rotates.

S.K.