

Using Dry Wall Spackle as a Filler Material  
Comparison of 10 Products  
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For many years I have used lightweight dry wall spackling paste as a filler material on wood and foam for model building as well as an occasional homebuilt part. Light weight spackle is much easier to apply right out of the container and easier to sand than epoxy micro. In recent years some spackle manufacturers have gone to vinyl based formulations and it became obvious that there must be a “Best Brand” product for our application.

With that in mind I scoured local hardware stores and lumber yards and collected up ten different brands and formulations. Each product was spread on a section of pink foam in various thicknesses and allowed to thoroughly dry.



Samples After Application and Drying

The spackle brands tested are listed below:

A	DAP DryDex	F	Smart Non-Shrink Wall Fix
B	3M Patch & Primer	G	Sherwin-Williams Shrink-Free
C	DAP Fast-n-Final	H	DAP Wall Board Joint Compound
D	ACE Lightweight Spackle	I	Red Devil One-Time
E	Patrick's Model Magic Filler	J	Red devil Pre-Mix Vinyl

After drying an initial inspection revealed several samples where the spackle had shrunk sufficiently to crack the surface. Obviously, these brands would not be suitable for use in thick sections.



Cracks due to Shrinkage

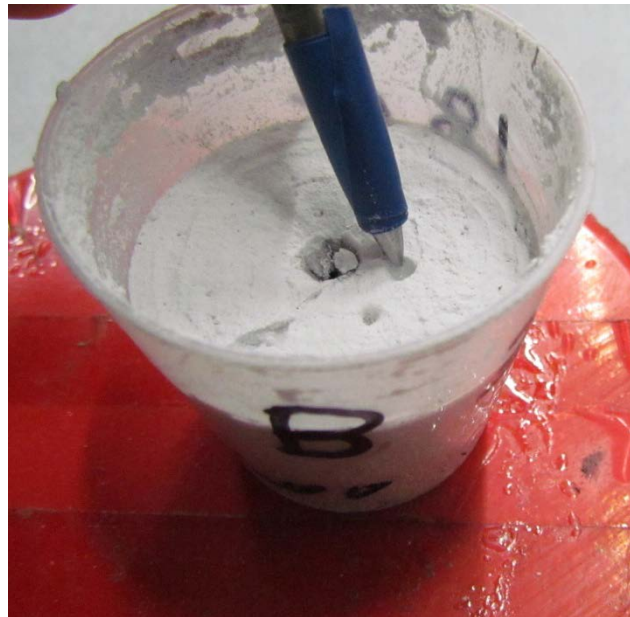
I also measured out equal volumes of each product in identical containers. Each was weighed when prepared and after a long drying time weighed again to determine the density of each sample. In addition I placed each sample on a scale and pushed an awl point to the same depth in each dry sample cup recording the force required.



### Samples for Density and Penetrator Test



Penetrator Force Measurement



Indentation made by Penetrator

The foam test pieces were taken to one of our EAA Chapter morning coffee sessions along with a supply of identical sanding blocks and an evaluation sheet for each. After much dust production and discussion I had a very non-scientific evaluation of the sanding characteristics of each sample.

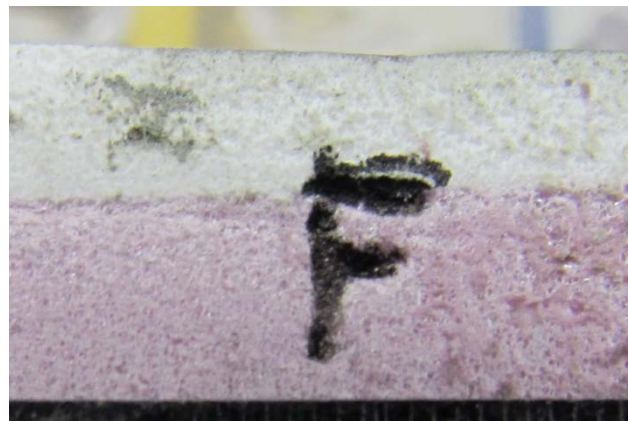


The Morning Coffee Group at Work Sanding Spackle Samples

After the groups had sanded all the samples smooth I applied a generous coat of Rust-Oleum grey primer and let it dry overnight. Each sample was then machine sanded on the side to expose the primer layer thickness. The samples were photographed and the primer layer thickness measured. The primer layer varied between .003 and .011 in. across the sample set and the thickest and thinnest are shown below. Most of the primer layer thickness is a result of the wet primer soaking into the spackle. This phenomenon was discussed with several builders here at the Independence Airpark and universally it was felt that any primer, paint or resin applied over lightweight spackle would thoroughly soak into the spackle. This turned out to be not the case with any of the ten brands tested. This results in an great increase in the spackle skin toughness, but no improvement to the shear strength of the spackle below the primer layer.



.011" Thick Primer Layer

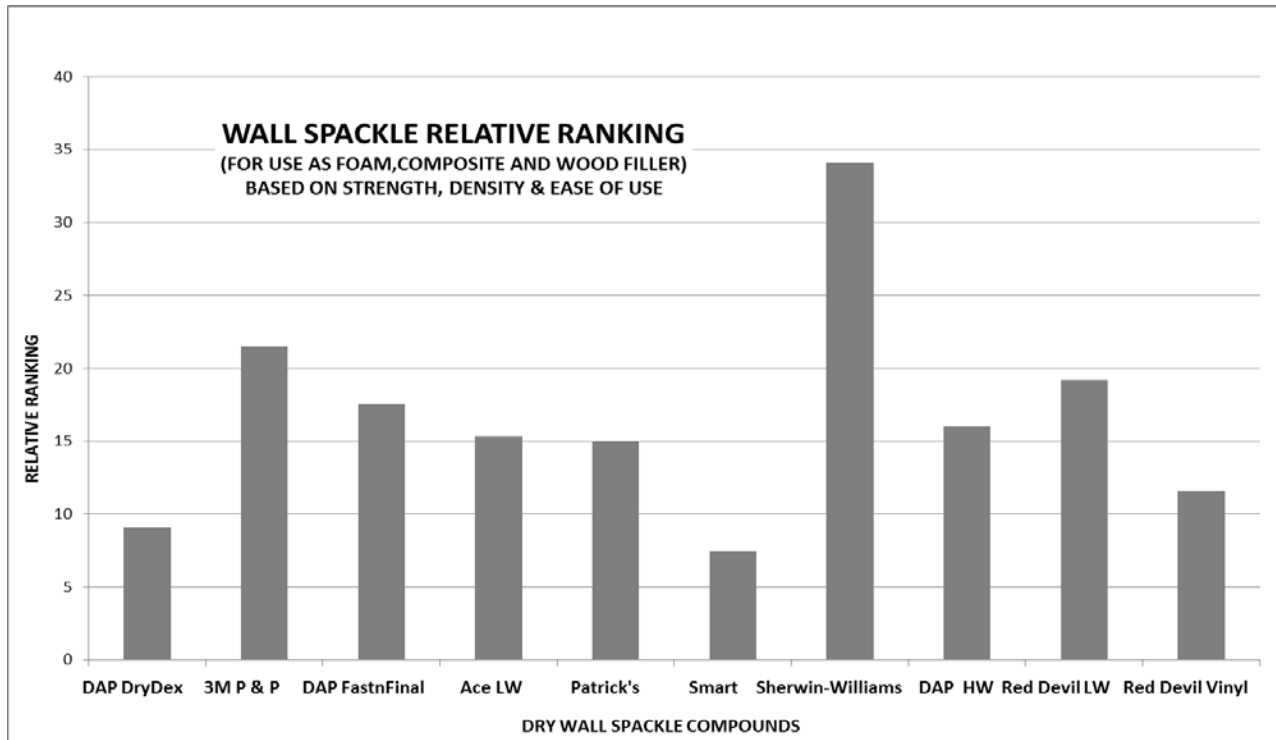


.003" Thick Primer Layer



### Applying Primer to All Samples

The group sanding test data along with my density, hardness and primer saturation findings were tabulated, messaged and the resulting rankings graphed below.

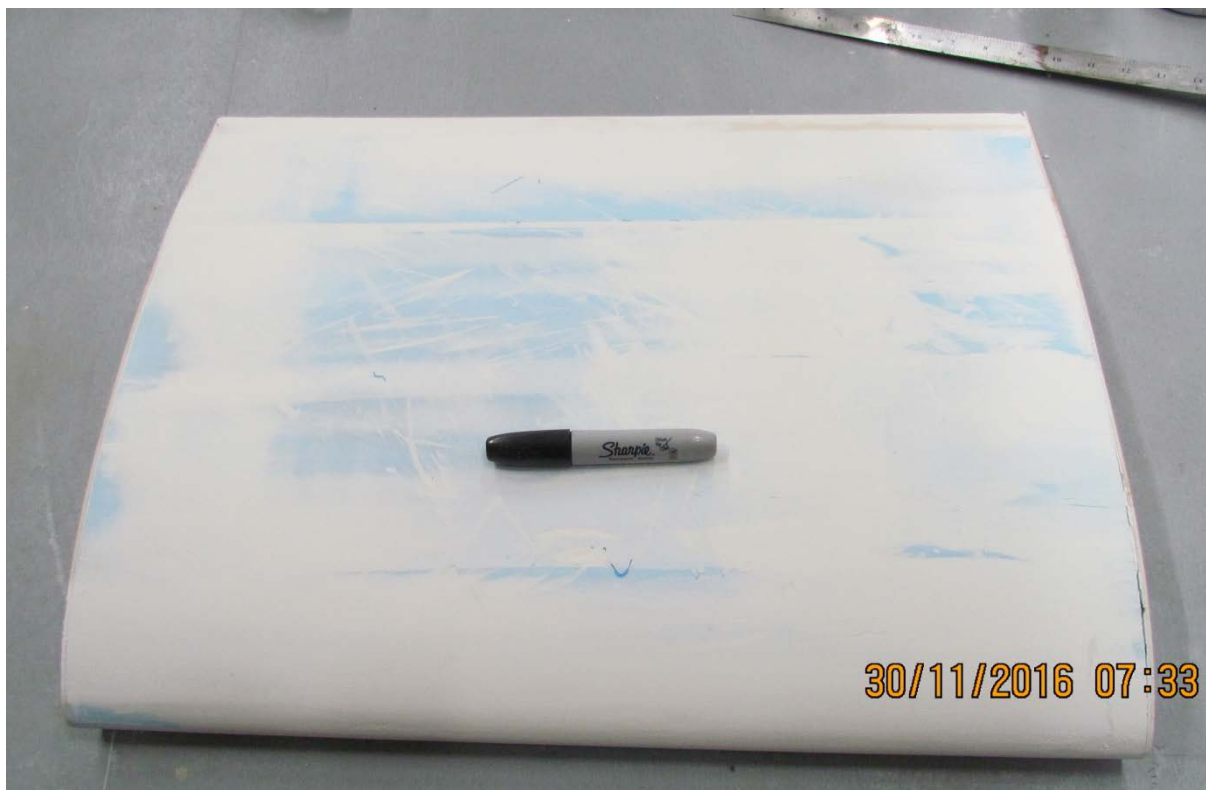


### Conclusions:

1. For applications where weight is an issue Sherwin-Williams Shrink Free Spackle is the best product. It sands well without balling up as some products do and is one of the stronger of the lightweight products. In addition, the product does not crack in thick sections (see #2).
2. None of these products should be applied in large area, thick sections (greater than .010 inch) under glass or carbon fiber due to their relatively low shear strength compared to composite materials. Using thicker spackle layers in these applications is to invite delamination. The overall strength of thin sections (less than .010 in.) will be improved by finish coatings.
3. For non-flight application such as molds or foam parts a heavy product such as DAP DryDex would be a good choice as it is easy to sand, is very strong and doesn't tend to crack in thick sections.
4. There was no advantage found in using the more expensive Patrick's Model Magic. This product is typical of several available at Hobby Shops and is

intended for the balsa and foam model builder. The product was harder to sand and offered no strength advantage over other lightweight spackle brands.

A recent project involved several square feet of hotwired foam to be filled bringing this "Best Brand" question up again. Dave Ullman, our past EAA Chapter President and fellow airpark resident built a large wind tunnel in his hangar and needed an airfoil test section. I hotwired the 18" X 24" section from blue foam and finished it with DAP Wall Board Joint compound. This heavy, plaster based filler was chosen because it is very strong, sands well and the airfoil is not going on an airplane. Had this been a part for a homebuilt I would have used epoxy/micro for the thick sections and the Sherwin-Williams product to fill minor roughness and pin holes after the primer coat was applied.

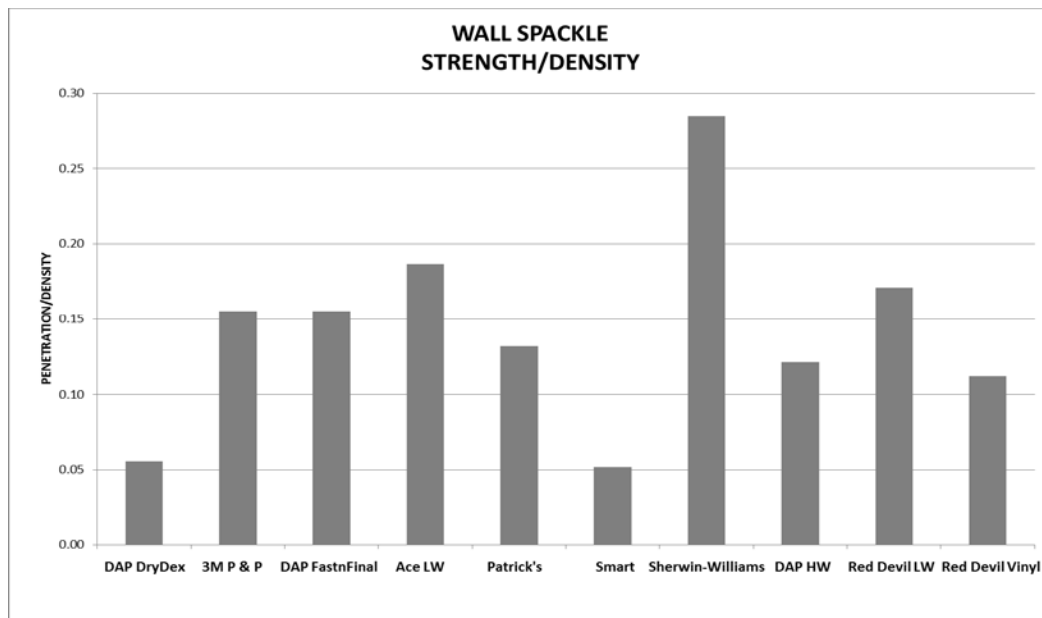


Wind Tunnel Test Airfoil

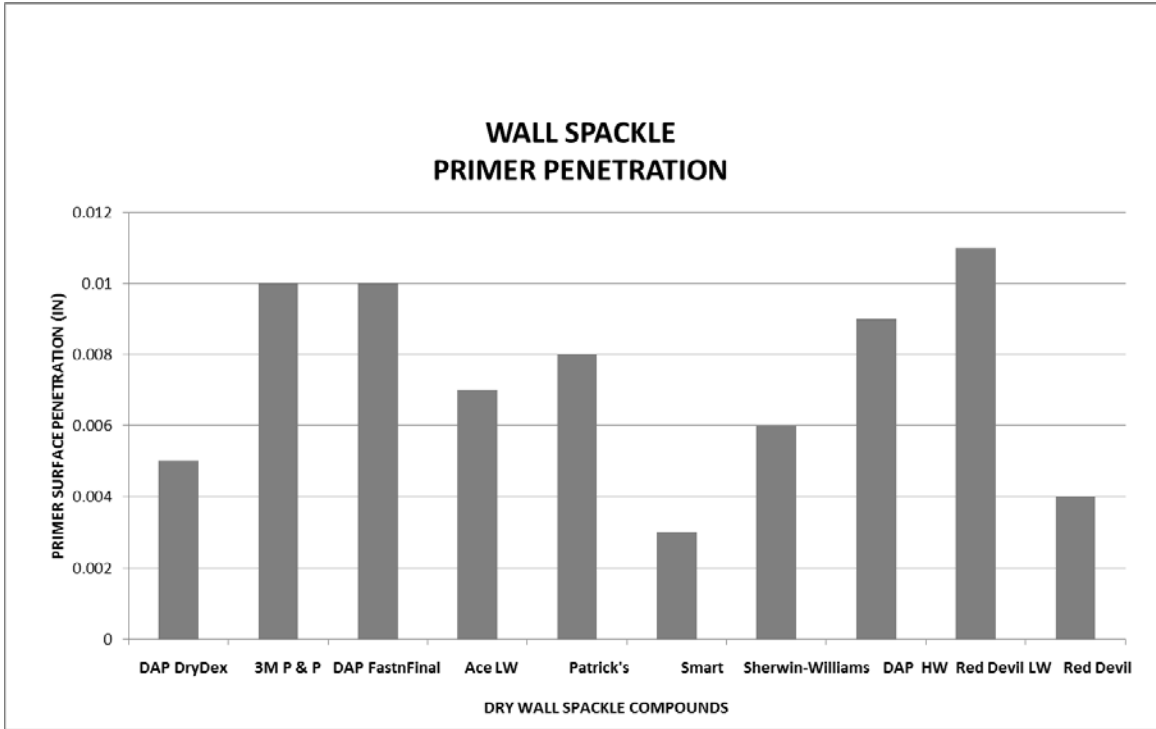
The data for those who just must dig deeper here is the data:

SPACKLE FILLER COMPARISON TEST												
ID	BRAND	NAME	SAMPLE	DENSITY	PENN TEST	PENN TEST	MERIT NUMBER	PRIMER SATURATION	THICK SECTION	SANDING	TESTER RANKING	COMPOSITE RANKING
			WEIGHT	(22 ML SAMPLE)							USEABLE?	
			(GR)	(LB/FT3)	(GR)	(LB)	(LB/DEN)	(IN)			Y - N	
A/1	DAP	DryDex	35	99.3	2500	5.5	0.06	0.005	OK	EASY - 8	3	9
B/2	3m	Patch & primer	6	17.0	1200	2.6	0.16	0.01	OK	EASY - 4	5	22
C/3	DAP	Fast-n-Final	5	14.2	1000	2.2	0.16	0.01	CRACK	EASY - 3 BALLS - 2	1	18
D/4	ACE	LW Spackle	5	14.2	1200	2.6	0.19	0.007	OK	EASY - 5 BALLS - 1	-4	15
E/5	Patrick's	Model Magic Filler	10	28.4	1700	3.7	0.13	0.008	OK	EASY - 3 HARD - 1	1	15
F/6	Smart	Non-Shrink Wall Fix	9	25.5	600	1.3	0.05	0.003	OK	EASY - 4 BALLS - 3	2	7
G/7	Sherwin-Williams	Shrink Free Spackling	6	17.0	2200	4.8	0.28	0.006	OK	EASY - 4 HARD - 1	5	34
H/8	DAP	Wall Board Joint Compound	32	90.8	5000	11.0	0.12	0.009	CRACK	EASY - 3 BALLS - 3	3	16
I/9	Red Devil	One Time	5	14.2	1100	2.4	0.17	0.011	OK	EASY - 6	1	19
J/10	Red Devil	Pre-Mix Vinyl	18	51.1	2600	5.7	0.11	0.004	CRACK	EASY - 6 BALLS - 2	0	12

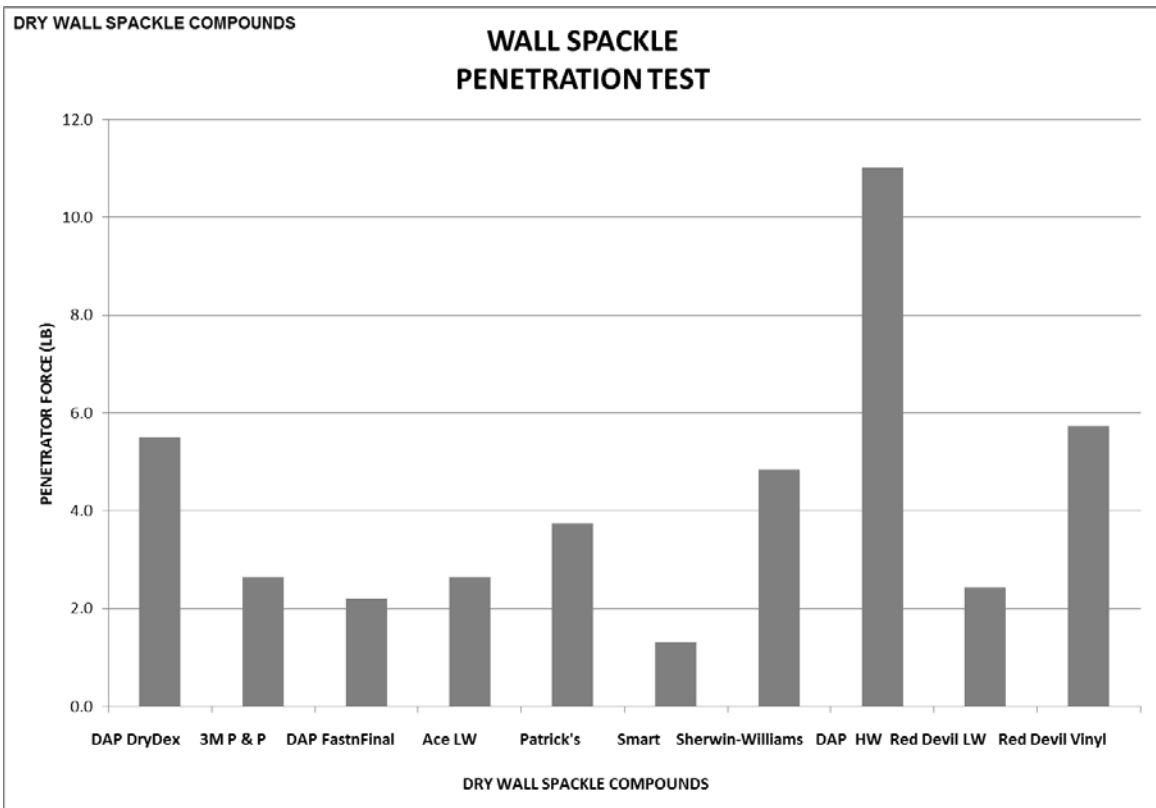
Graphical data presentations:



Penetrator Force/Sample Density



Distance the Rust-Oleum Primer Soaked into the Spackle



Force Required to Penetrate Sample to a Set Depth