Sundry Snippets 11 - Raw Materials

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No rules

For this issue our Editor has asked for something on materials. This is a difficult one, as just about anything can be used, but what is actually used is often governed by what is available or fashionable at the time. In the post-war period of the 50s, I built steam-outline locomotives from 1mm ply and postcards. If you adapt to the materials, it is surprising what can result. I ran for some years a streamlined, pantograph-fitted locomotive body, made from balsa wood which had been sanded and shaped aircraft-style, on two Romford motor bogies.

There are certainly no rules on what should, or should not, be used for almost any purpose (after all, who ever thought we would cast bodies in resin?). So I shall simply compile a table of materials with some comments on the various characteristics and methods of joining.

Tinplate

This material is one of the easiest to handle and it is free. If you carefully open out an empty one-gallon can of oil, using a slitting saw, cut it into four usable sections, lay them on a clean flat surface and scrape the paint off the outside with a piece of hard wood. You now have a very thin sheet of steel. It has a few 'thou' of tin on each side, which takes solder very well, and can be soldered to copper, brass, zinc, and even white metal. It is very easy to bend and once assembled into a model it is very strong. It also takes rivet detail very well. Its two main drawbacks are firstly that the edges are not tinned, and so must be carefully painted, and secondly, being steel, it can affect the magnetic field of the motor. If the motor is in the tender, this is not a problem.

Nickel Silver

This is the most popular material choice of most people, as it is probably the strongest for a given thickness and has all the good points of tinplate. It is very easy to clean for soldering, and will not go rusty if scratched. But, you do have to buy it!

There are grades of nickel silver from hard and springy to soft and bendy. I would use the hard version for flat surfaces and chassis, but use a half-hard brass for curved footplates and smokebox cladding, and the like.

Brass

Brass is an alloy of copper and zinc and again comes in hard and half-hard varieties. It solders well, but is harder to keep clean as it oxidises quite quickly. If you have to turn or machine solid brass, make sure you are use the hard variety, which should be roughly the same colour as 15 carat gold – a rich yellow colour! I only make this point because there are other alloys used for brass, one of them being aluminium. This gives the material a silver sheen and should be avoided like the plague, as it is a Grade 1 tool and drill breaker.

Zinc

Zinc is a soft and easily worked material, but it is a devil to keep clean enough to solder two sheets of panelling together. I was once asked to make a pattern for a white metal coach kit, as favoured by some mould makers. It is emphatically not an exercise I would do again.

Copper

This is a base metal, and is alloyed with many different
metals. In its pure form, it can be worked into all manner of shapes by heating it to red hot and allowing it to cool before working it. It re-hardens as it is worked, so the process has to be repeated. It solders well but plenty of flux is needed to keep it clean.

Central heating pipe can be fashioned into haystack fireboxes, and copper bar can be turned on the lathe for copper-capped chimneys, but this needs a very sharp tool, a low speed, and lubrication – spit is quite good!

Phosphor Bronze

PB is an alloy of copper and tin, and has most of the characteristics of nickel silver. I prefer it for turning copper chimneys, and the difference in colour is minimal.

White Metal

The use of white metal in castings has been with us for many years in model railways, and only lately has it begun to be eased out of use on the main assemblies by etched brass, plastic and the resins. White metal is a tin- (not lead) based alloy, and the elements added to the tin depend on the type of casting we require, i.e. to flow easily (but this can be brittle), or to flow and be flexible, or to have variable shrinkage, and so on – there are hundreds of permutations.

I know there are all kinds of grades of solder and temperatures, but I feel they are messy, complicated and expensive, and are in fact a fashionable gimmick (now that should result in the *Mailbags* page swelling in the next issue). For myself, I use the ordinary 'standard' solder that I use for brass, nickel silver, or copper on white metal. The only secret is – never go near the castings with a dry iron, or the casting will flow on to the iron. Use plenty of flux, and keep plenty of solder on the iron. Many of the things for which 'low melt' is recommended can be soldered in this way. Of course, you can also use the range of 'instant' adhesives.

As an example to back up my outrageous claim, I offer a method of soldering a brass wire on to a delicate white metal spring: drill a 'wire-sized' hole in the spring, tin the wire, and then – with plenty of flux on the spring, insert the tinned end of the wire into the hole. Now, hold your iron on the wire a few mm. from the casting. In a few seconds the solder on the wire will 'run' and bond on to the spring casting. As soon as it does, remove the iron. If you are of a nervous disposition, experiment on some scrap sprues first.

Plastic

This tem covers a whole multitude of materials which all have different adhesives. The ones which will concern us most are the styrene group, used in most plastic kits and the DIY form of Plastikard, and the nylon group with its varieties which are used in many of the wagon and locomotive wheelsets.

The main adhesives used on plastic kits and Plastikard are the liquid solvents applied with a brush, or the polystyrene cement issued in the kit.

One of the rules with styrene is not to glue it with EvoStick, as it wrinkles the plastic. This is true, even if you leave it sticky between the panels to be joined. But why use it anyway?

Well, you can stick your styrene to almost any other material with EvoStick – wood, brass, aluminium, whatever – by lightly coating both materials, and allowing to dry for about 10 minutes, and then pressing them together. This can be useful when mounting motor bogies and the like in a plastic body.

When it comes to fitting balance weights, the nylon used in locomotive wheels does not like any adhesive I have tried. EvoStick will do it, but the wheel must be absolutely and totally grease-free. Where I have to fill in between spokes I press Plastic Padding in front and back overdoing it slightly, and then carving down to shape and size, after it has cured.

Finally

Any of the materials I have mentioned, including circuit board, aluminium, and most others, can be joined by the 'dry' EvoStick method, so don't be limited by solder.