



Useful Materials


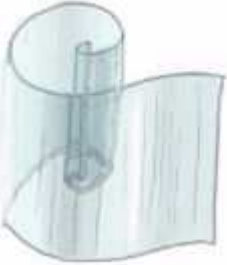

We can start our job by organizing our materials:





The materials that we will use may not be within this list, since our materials needs depends on our imagination limits, and even if they listed, it does not mean that you it will need to use them in order to achieve good results.



Following, there are a comprehensive list of useful materials :

Model Basis :



	<p>A4 PAPER</p> <p>The A4 paper is useful for notations, models covering, paint masks production, molds production and construction of light model's parts.</p> <p>In truth any notebook or printer paper can be used for all of these purposes. You must prefer, however, fine and nom coated papers.</p>
	<p>CARDBOARD</p> <p>The cardboard is the most useful basic material to make alternative models like the mine. It do not have necessarily to be the primary material of your models, however. You can use wood, beer can, and other materials.</p> <p>When you want to make any type of static part for your models, the cardboard will be an excellent material, except when you want to use molds. In such a way, you need to use paper.</p> <p>You will find this type of cardboard in commercial products boxes, like shoes or cereals boxes. In Brazilian shoemaker materials shops you will find "Paraná" or "Panama". Forgive this Brazilian name... It's a heavy cardboard used to make shoes soles and is little recommended to make your models. You can still use Bristol board, but it has some disadvantages when compared to the product packing cardboard.</p>


	<p>CORRUGATED CARDBOARD</p> <p>The corrugated cardboard is a special anti-shock packing material mainly used for goods storage. It has one or more wavy styled paper sheet between their outside thick paper faces, that provides mechanical protection to the commercial products stored inside.</p> <p>This type of cardboard is extremely useful to achieve volume and mechanical resistance in huge model's parts like the wings. It can always be beveled with the aid of a knife, producing thin wing edges, so don't worry about their volume on the edges of your model. It also can be used to produce multi-planar perpendicular scaffoldings, when these structures need to support intense tensions.</p> <p>This type of material can be gotten of opened products crates and boxes that supermarkets throw away, or that they use to organize your purchases. You must disassemble these boxes and keep them stored as sheets. Depending on the material quality, your corrugated cardboard sheets will support some weight on them, before get deformed.</p>
	<p>FIRM AND TRANSPARENT PLASTIC SHEETS (Polyethylene Sheets)</p> <p>I still can't found a correct definition for that material I have used in the glass simulation of my models. Some retailers said it is some sort of polyethylene... Despite of this, this plastic sheet can be found in some products packings, with different aspects, textures and opacities... Well! The material that we want to use is similar to the one used in soft drink's pet packings. This material will be used to mimesis all the glasswork of the airplane.</p> <p>You will be able to find this material in a sort of commercial products packings, including the Pet bottles, toys boxes, or in other product boxes that came with a visualization window. In case you still want to buy this material, it may be found in shoemaker materials suppliers.</p>
	<p>BEER OR SOFT DRINK CANS</p> <p>The beer and soft drink cans are another very useful material. It can be used in the construction of mobile parts as hinges and bearings. Basically, you will substitute the cardboard with the can, in all the places that needs high mechanical resistance. You may use the beer cans to produce the propulsion helix shovels, the landing gears connecting rods, to produce hinges and wheels.</p> <p>You may cut-off the middle smooth surface of the beer can, to produce can sheets.</p>

	<p>BROWN PAPER</p> <p>The “brown paper” is a thick and brown coarse paper that we normally use here, in Brazil, to make school presentation wall panels. This paper is useful for one model covering and finishing technique suggested in this tutorial. It provides high mechanical resistance to the model’s surface being, however, a little difficult to work with it. It is the ideal paper for heavy glue jobs at surface areas that will need to resist to strong tensions.</p> <p>You can find it in stationery stores. The thick outside faces of the corrugated cardboard can also be used for this purpose!</p>
	<p>COOKING ALUMINUM FOIL</p> <p>The aluminum foil is an interesting material to produce metallized surfaces. Its reflective face can still be used to simulate navigation lighthouses reflectors. It is useful basically as finishing material to complement the painting job.</p> <p>It can be found in supermarkets. Look for it among other products for kitchen.</p>
	<p>CORRUGATED PAPER</p> <p>The corrugated paper will be useful in some special tasks, when you want to take advantage of their wave texture. It is useful to simulate corrugated roofs in dioramas. This material will still be useful for the construction of delicate hinges and sockets rolling axles (It is preferable to use beer can for this job).</p> <p>I recommend you to extract the corrugated paper from the corrugated cardboard. You will be able to buy this kind of paper too. Look in stationery stores.</p>
	<p>BROOM HANDLE</p> <p>I currently don’t use this material regularly. In the past I produced wooden spinners and the propulsion helix support (the aircraft’s engine section) with a piece of broom handle. Today, I use EVA to make spinners, and I’m looking for another material to make the aircraft’s engine section. Due to the circular movement of the aircraft’s propulsion helix, the broom handle still is the best choice to make the aircraft’s engine section, since this part of the model must be mechanically resistant. Although, I have successfully used cork oak as engine section.</p> <p>You must store the handles of old and/or broken-down brooms.</p>



	<p>WOODEN PLATES</p> <p>In the past I used the wooden plates to produce the radial engine section of my two focke-wulf fw190 models. I produced these engine sections by cutting wooden disks with the aid of a cup shaped saw blade. I'm looking for a substitute of this material now, but perhaps, with the use of tools adjusted for notch, this material can get useful again, providing a way to product near perfect radial engines; At now, it is in disuse.</p> <p>You will find wooden plates in lumber mills. Don't get huge or thick plates, since you must use the cup shaped saw blade in this job, and this tool can't cut deeply in the wood. Prefer to use soft wood!</p>
	<p>EVA</p> <p>The EVA is some kind of synthetic rubber used in shoes soles and provided in a variety of sheet thickness.</p> <p>This material will be useful in the production of tires, spinners, in the fulfilling of hollow volumes and other possible uses.</p> <p>I use it to make tires and spinners in due to the easiness of it's modeling work at the lathe, being easy to produce such parts, and adjust them with a scissors later. You carve it in the lathe to produce a spinner, and opens the holes from within the shovels of the propulsion helix pass trough with the scissors, in a easy way, without great physical effort.</p> <p>It can be found in shoemaker materials suppliers</p> <p>You must be cautious when going to buy EVA since some of the EVA leves, therefore some sheets of EVA are very soft and easily become deformed. You must look at a dense and firm EVA sheet that will support the weight of the entire model when it is assembled.</p>




Glues


	<p>WHITE GLUE</p> <p>This is the basic glue to work with cardboard, wood and EVA. This glue main characteristics are the excellent tack on porous materials, solubility in water, it's transparency and it's malleability when it dries.</p> <p>Mixed to ethylic alcohol this glue will chemical react, changing itself into a crystalline waterproof substance. This substance serves very well as basis for oily inks as soon as for inks soluble in water, and It can stabilize itself on oily surfaces, plastics and metals (It is possible, but not so easy as you can think by reading this topic).</p> <p>The white glue does not adhere itself on plastics and metals.</p> <p>You can buy it in supermarkets, and you must look for the blue label glue (if it is an universal standard to get the stronger PVA glue on blue labeled bottles), or use those glues specifically made for wood (orange label).</p>
	<p>CYANOACRYLATE</p> <p>These are fast drying glues designed to glue almost any type of surface.</p> <p>Famous by their supposed mechanical resistance, they are generally more capable to glue your fingers together than to glue the surfaces on which they are applied. This glue does not offer as much resistance as we can think by seen the TV propaganda. They are, however, very efficient to join parts quickly.</p> <p>You must avoid using excess of this glue, since you will delay it's dry.</p> <p>Warning: It is a toxic and very volatile material that evaporates even after dry when exposed to intense heat.</p> <p>I suggest you to strengthen any cyanoacrylate glued joint on wood, on cardboard or on beer can by applying white glue, hot glue or heavy duty tape.</p> <p>I don't recommend the use of cyanoacrylate on plastic surfaces, since it can dissolve the plastic, or leave spots on it.</p> <p>You can buy this kind of glue in supermarkets.</p>

	HOT GLUE
	The hot glue is a pure mechanical tack material. Since it, its tack is not very good on smooth materials like the beer can. Since this glue acts when hot I don't recommend their use it on fine plastic surfaces.
	This is a very mechanical resistant material, very good to glue paper and coarse porous surfaces. Its better use, however, is as reinforcement for models parts that will support some weight.
	The hot glue can still be used to fill holes in the model's surfaces.
	Look for it at artisan materials stores.


Structural axles and Reinforcements

	SEWING PINS
	The sewing pins are useful for the construction of small axles, generally in the joints of landing gears. They can still be used to simulate control handlers on the cockpit.
	They can be found in a sort of different places, since bazaars to supermarkets.
	RIGID ELECTRIC CABLE
	Both the rigid wire and plastic or rubber layer are useful...
	In the past I used copper wire to produce axles, landing gears connecting rods and structural reinforcements for heavy joints. This material is basically used as a common wire, however the copper is easier to shape than the steel. Furthermore, the copper wires from the electric cables can be easily found in bigger thickness than the steel wires.
	You must remember, however, that the copper is a precious and very expensive metal.
	The rubber or plastic layer or cardboard can serve to produce exhaust pipes, hoses, or any another tubular form that is necessary, but does not have to support tension or weight.
	You can find rigid wires in electric materials stores.



	<p>WOODEN STICKS</p> <p>The wooden sticks are a good option for the production of cannons and structural reinforcements.</p> <p>Easy of shape and glue, flexible and relatively mechanical resistant they are one of the basic materials for the production of the alternative models, through the techniques suggested in this tutorial.</p> <p>In the past I used matches to make cannons. Knowing that the matches are square shaped, and that I needed to sand its edges to get cylinders, I started to use the kitchen wooden sticks.</p> <p>You will be able to buy them in any supermarket. I suggest you to look at different marks in a way to find better quality wood.</p>
	<p>SMALL NAILS</p> <p>Nails will basically be used as axles for the propulsion helix.</p> <p>Due to its difficulty to glue and its limited dimension standards it hardly will be a good material for structural reinforcements, unless you will work primarily with beer can, that can need stronger reinforcements.</p> <p>You will find them in hardware stores or in construction materials stores.</p>
	<p>BLIND RIVETS</p> <p>Thinking about producing a P-47 model, I perceived that the head of the blind rivets are sufficiently similar to the support of the P-47 propulsion helix to be used in my models. Well! I started to research and I produced my first helix made of can. Since this moment, I started to use the blind rivets as support or axle for the propulsion helixes and spinners.</p> <p>Look for them at hardware stores.</p>

	HEAVY DUTY CLEAR TAPE
	It is a transparent and very adhesive tape mainly used to seal up supplier's product boxes during storage. It comes in very thick coils.
	Very adhesive and poorly elastic, this tape is appropriate for the temporary immobilization (and permanent immobilization in some few cases) of materials during the glue working. Used in the landing gears this tape can be used as permanent material, since there, it will be firmly rolled up, and will be strengthened with the cyanoacrylate used to glue the can that composes the main connect rod.
	Never use tapes as finishing material, since they probable will separate from the surface with little time. You can look for it at stationery stores.



Materials For Painting


	INKS FOR USE WITH BRUSHES
	You can paint your model entirely with brushes. I prefer to use brushes only to paint signs and small details.
	You can use oil soluble ink, acrylic ink and synthetic enamel. Other inks can be used, but I need to warn you that some of them are very transparent, or produce undesirable texture and cover the surface with very thick layers.
	You can buy good and fine inks in the hobby materials stores, with the adequate colors of the Armed Forces of each country. Good inks can also be found in other artisan materials stores.

 An illustration of a green aerosol ink can with a blue nozzle and a blue brush. The can has a yellow label with the word 'MARCA' and 'XXXX' visible. The brush has a blue handle and a yellow label with 'XXXX' written on it.	<p>AEROSOL INK</p> <p>If you don't have an aerograph or it isn't important to match the correct colors of your airplane, and you want to achieve the spray like aspect on the painted surface (homogeneous surfaces, with soft color arrays and without scratches), the aerosol ink can be a good option. I already abandoned these aerosol inks and I'm now using only the aerosol colorless varnish due to its easiness of use.</p> <p>The aerosol colorless varnish is especially useful because the spray will not remove the ink of the bottom painting layers, preventing the appearance of spots in the painting. (A brush can produce this kind of garbage).</p> <p>Warning! Never tries to use aerosol cans as source of can to use in your models. They can blow-up in your hands if punctured.</p> <p>You will find aerosol ink cans in several ink stores. In Brazil, this kind of ink isn't freely sold. You must identify yourself and be more than 18 years old.</p>
 A small glass bottle of ink with a red cap. The label is white with 'MARCA' in large letters and 'MR-001' in smaller letters below it.	<p>INKS SUITABLES FOR USE WITH THE AEROGRAPH</p> <p>The inks that are suitable to use with the aerograph are very fine inks, with strong pigments. The inks produced by the same brands of the scale kits are commonly projected to be used with the aerograph. Its pigments are so strong that they cover the painted surface efficiently when very diluted.</p> <p>You will be able to use other kinds of inks with the aerograph. The common acrylic ink is an example, but it must be filtered with half felt or some fine cloth, in a way to eliminate the splodges that these inks forms. If you don't filtrate the ink you will obstruct your aerograph.</p> <p>In the past I believed this ink filtration was unnecessary, but today, I know that the clogging problem is really serious.</p> <p>You can look for good inks to use with aerographs at the modeling art materials retailers.</p>
 A roll of white toilet paper, partially unrolled, showing the texture of the paper.	<p>TOILET PAPER OR ABSORBENT PAPER</p> <p>This is an auxiliary material (it will not be used to mount the model) that can be used for cleanness, as mask for painting, or as filter to filtrate ink.</p> <p>The toilet paper itself isn't useful as an ink filter. To do so, you must use coffee paper filters, or kitchen towel. Some kitchen towel brands offer a waterproofed absorbent paper.</p> <p>You can look for these papers at supermarkets.</p>


	<p>LOW DUTY PAPER TAPE</p> <p>Due to low tack of this tape and to its easiness of cut, it could be used to produce painting masks or to protect the glasswork of the airplane during the painting work. In the truth, It is the best material you can use to adhere your masks to a previous painted surface.</p> <p>Due to its low tack, this kind of tape will not be useful for other tasks.</p> <p>You can buy low duty paper tapes at stationery stores.</p>
	<p>WAXED PAPER</p> <p>This material can be used as basis to produce decals. I consider better, however, who you to wax common A4 paper to substitute the industrial waxed paper.</p> <p>The kitchen waxed paper seems to be useless to us, at now. You may find some use to it in the future, of course...</p> <p>You can read the paper on the use of alternative decals by clicking here. It will explain the use of waxed paper as basis for decals</p> <p>You can alternatively use the waxed paper from the back of adhesive printer paper. Buy it at stationery stores.</p>


Lubricant Materials




	<p>COOKING OIL</p> <p>This oil is especially useful to dip in grease glue moulds. (These are the same moulds I will explain later in this tutorial, on how to make and use them). It will guarantee that the glue of the molded aircraft piece will not glue the mould too.</p> <p>You can buy it at supermarkets.</p>
	<p>SEWING MACHINE OIL</p> <p>The sewing machine oil is a very fine lubricant oil that is commonly used in high rotation machines, like the sewing machines</p> <p>It will be useful to grease the avionics hinges since it flows easily through the openings of the can hinges.</p> <p>You can buy it at supermarkets and at sewing materials retailers.</p>

	PETROLEUM JELLY And GREASE
	In the alternative modeling, we will use petroleum jelly or grease as an almost permanent lubricant to bearings.
	Petroleum jelly is transparent, less toxic, and of better smell than the grease, being therefore recommendable to use it, nor the grease for this job. You can buy petroleum jelly in pharmacies and supermarkets. The grease will be found at automotive services and at some supermarkets.

Finishing: to sand and to fix surfaces

	ACRYLIC MODELING MASS
	The acrylic modeling mass has very fine texture, producing a rubberized finishing after dried. This material suffer low retraction when dry, but the dry surface may present some cracks. This is an easy to sand material... (Not so easy as the acrylic plaster).
	You can use this kind of material to remove grain and depressions from the model's surfaces... You can look for it at artisan materials retailers.

	ACRYLIC PLASTER
	This material is similar to the acrylic modeling mass, but its texture is smoother than the acrylic modeling mass surface, being easier to sand. This material suffer, however, great retraction when dries.
	This material is useful when applied in combination with the acrylic modeling mass. You must see I never mixed the two fresh bottles contents, but I applied acrylic modeling mass, wait it dry and I applied the acrylic plaster on the retraction cracks. You can look for it at artisan materials retailers.

	<p>GRAPHITE</p> <p>The graphite is a solid lubricant, and ca also be used as basis material to produce putty. (You can combine the graphite with cosmetic enamel for this job).</p> <p>When you combine the graphite with enough enamel, the graphite will get suspended in the enamel, producing some type of modeling mass that you can use to remove cracks or depressions.</p> <p>This material will become resistant and easy to sand when dry, due to the influence of the cosmetic enamel.</p> <p>The best characteristic of this material is that it does not suffer any retraction when drying (or at least you will not observe retraction).</p> <p>You can look for graphite at supermarkets.</p>
	<p>LEACHED ASHES</p> <p>The leached ashes will be used as base for putty in a similar way to the graphite, but I suspend this material in white glue, not in enamel.</p> <p>The leached ashes must be bolted, before using, to prevent the small cellulose fragments to make the putty coarser.</p> <p>This material characteristics are very similar to that of the graphite, as basis for putty, but the white glue takes longer to dry than the enamel, and I never tried to use enamel + leached ashes to make putty.</p> <p>You can use the leached ashes from the barbecue grill.</p>
	<p>COAL</p> <p>The coal is coarser than the graphite or the leached ashes, but these all are basically carbon composites.</p> <p>As the coal is not disaggregated, it will be necessary to triturate it and later to bolt it for its use as basis for putty.</p> <p>This material characteristics are very similar to that of the graphite, as basis for putty. You must remember, however, that the white glue takes longer to dry than the enamel. I never tried to use enamel + coal to produce putty.</p> <p>I say that you can find coal on the same place you will find the leashed ashes? Its advantage to these other materials is its relief.</p>

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Probably you it will find difficulties when start to use some of these materials. This difficulty is normal, since the use of any tool or material gets better with experience... You must, however, look at the correct tools to make each work and performs better with each material. Moreover, a little research may helps. Remember that beyond each material's handle and use characteristics, it is necessary whom you attempt for its durability to the physical and chemical consuming that the storage time can impose. Because of this storage time issue, it is interesting who you read others two sections of this website in order to get more information on each of these materials characteristics.

You must visit:

http://www.modelismo.alternativo.nom.br/organizando_material.php to get information on the preparation and storage of some of these listed materials.

You must also visit:

http://www.modelismo.alternativo.nom.br/artigo_reforma.php to get more information on the durability of certain materials, when you apply then at the construction of specific model pieces. This second reference I suggest to you brings the compiled experiences from the restoration of two of my existing models, one of them 13 years old.

The techniques and materials research is very important for the alternative modeling art. Because of this, I insist that you being an alternative modeler or not, share your knowledge with this rising community. Your experiences are very useful, no matter if you still don't have alternative modeling experience, since simple ideas are a great contribution.

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