Foam and Model Airplanes – 101
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You are looking at purchasing a foam airplane. You are comparing the airplanes and you note they are advertising constructed from foams such as, EPS, XPS, EPO, DEPRON, STYROFOAM, EPP and ELAPOR. What are these foams?? The majority of the foam airplanes (Foamies) available to the modelers are manufactured from Polystyrene and Polypropylene. Polystyrene is a strong vinyl polymer plastic that can be injected, extruded or blow molded and Styrofoam is a popular foam polystyrene packaging. The manufacturing process determines the type of foam, EPS, XPS, EPO, etc. Polypropylene is an engineered plastic foam. This foam is extremely durable and lightweight.

The following is a description of these foams:

EPS Expanded Polystyrene (EPS), is the generic industry name for a white, open-celled, porous, rigid material made by expanding polystyrene beads with steam and bonding the beads together under pressure.

XPS XPS refers to the closed-cell, hard-shelled type of foam favored for model airplane use.

EPO (Piocelan) "PIOCELAN" is a highly-functional foam resin to which polyolefin characteristics are added maintaining the characteristics of expanded polystyrene, but properties previously regarded as weak points, such as shock resistance, chemical resistance and abrasion resistance, have been significantly improved.

DEPRON Depron is manufactured by blowing air into the polystyrene to make foam. This foam comes in EPS and XPS varieties and possesses durability and low cost of manufacture. Many of the "Foamies" are built today with Depron foam.

STYROFOAM Styrofoam® is a Dow Chemical Co. trademarked form of extruded polystyrene foam. The term STYROFOAM is often used to refer to expanded polystyrene (EPS) even though the materials are completely different.

EPP Expanded Polypropylene, is an engineered plastic foam material. This foam is extremely durable and lightweight, because it is made out of little bubbles of CO2 and polypropylene resin. This foam will withstand even the hardest crashes. EPP foam is not mold-able. Airplanes are usually flat sheet.

ELAPOR Elapor foam is made primarily out of Styrofoam; so, while it isn't the most durable, it is somewhat a tough, flexible foam able to be molded unlike EPP.

With the above descriptions this is the way I would break it down:

EPS The basic Polystyrene foam. White, porous, rigid material. The least strongest,

XPS Closed-cell, hard-shelled type of foam. Airplanes have a better finish then EPS and a little stronger.

EPO Is a durable, flexible, and adhesive-friendly foam. It is both durable and lightweight.

DEPRON Comes in EPS and XPS varieties and possesses durability, less brittle, and smooth surface finish.

STYROFOAM Is extruded polystyrene and it is different then the other polystyrenes. Breaks easy.

EPP Is extremely durable and lightweight. It will withstand even the hardest crashes. However it does tear easy. EPP foam is not mold-able, so airplanes are usually flat sheet.

ELAPOR Elapor foam is made primarily out of Styrofoam. It isn't the most durable foam, but it is somewhat a tough, flexible foam.

ADHESIVES

O.K. now what about adhesives for these foams? EPS, XPS, EPO, DEPRON and STYROFOAM must use a Polystyrene safe adhesive. There are many available. In the Cyanoacrylates there are the foam safe Ca, gap fill and kicker. BEACON makes a 'FOAM TAC'. White glue and epoxy also work. There are others, so what ever you use jmake sure it is Polystyrene compatible, not Polyurethane compatible. For EPP and ELAPOR it is just the reverse of the other foams. Foam safe Ca's, White glue and epoxy do not work. For these you use the regular Cyanoacrylate's, I have read where the builder used a low-temp setting hot glue for EPP.

Table 1 shows the foams and applicable adhesives.

FOAMS	FOAM SAFE cyano					REGULAR cyano		
Polystyrene Foam	CA	Gap Fill	Kicker	White Glue	Epoxy	CA	Gap Fill	Kicker
EPS		X	X	X	X			
XPS	X	X	X	X	X			
EPO	X	X	X	X	X			
DEPRON	X	X	X	X	X			
STYROFOAM		X	X	X	X			
Polypropylene Foam								
EPP						X	X	X
ELAPOR						X	X	X

What ever you do, keep acetone and lacquator thinner away from these foams. Otherwise you will see a spectacular demonstration of turning a solid into a mess.

PAINTS

Use Acrylic paints (water based). I have used ‘Tamiya paint for plastics’ (contains acetone) successfully on EPS and ELAPOR foam by spraying light thin coats.