The use of composite materials in homebuilt aircraft construction got its start back in 1970 when Ken Rand introduced his KR-1 and KR-2 kits. At the same time, a young designer named Burt Rutan was completing the design of his VariViggen which was awarded the Stan Dzik Trophy for design contribution at Oshkosh in 1972. Although this aircraft featured some composite construction materials, it was fairly labor intensive to build and interest was modest. Taking the canard design concept a step further and simplifying construction through the use of the moldless composite technique, Burt educated thousands of builders and future designers through his plans, construction manuals, and many seminars and convinced aircraft enthusiasts worldwide that composites were indeed the future for aviation construction. Rutan Aircraft Factory followed the tremendous success of the VariEze kit program with plans for new designs such as the Long-EZ, Defiant, and Solitaire. At the same time, SCALED, Burt’s new company specializing in design and prototype construction, was busy building proof-of-concept aircraft such as the AD-1, Grizzly, and Beech Stanship. Burt continues to operate SCALED today and remains active in designing and building the aircraft of tomorrow. We hope he will someday return to the homebuilt aircraft market, and arena that allowed him endless freedom to pursue aircraft design innovation.

During the 1980’s many new designers entered the homebuilt aircraft market including Nat Puffer who introduced the popular Cozy, a side-by-side version of the Long-EZ. Aircraft Spruce & Specialty Co. became the distributor of Cozy kits as it had been for the Rutan designs since 1976. Hundreds of kits were shipped worldwide, and Aircraft Spruce grew as quickly as the composite movement. At the same time, Aircraft Spruce began supplying kits and materials to designers marketing their own new designs using the new “fast-build” pre-fabricated kit concept. This type of kit program was pioneered by Tom Jewett and Gene Sheehan of Quickie Aircraft and Tom Hamilton of Glasair fame. Many new designs followed, including Lance Niebauer’s Lancair, Ken Wheeler’s Express, the Cirrus and White Lightning. Aircraft Spruce has been a supplier of materials for all of these kit programs, and looks forward to working with the designers of new composite aircraft on their kit programs in the years to come. The design sophistication and ease of construction that are offered in composite aircraft kits today have provided a way for many aviation enthusiasts to build and fly higher performance aircraft at affordable prices. What an exciting time to be involved in sport aviation!

Advanced composite fabrics are those materials which have been used for a number of years in aerospace applications, replacing standard fiber-glass fabrics. Today’s materials - Kevlar, graphite, S glass and ceramics - are now making the transition from aerospace to homebuilt aircraft. Kevlar is an organic fiber which is yellow in color and soft to touch. It is extremely strong and tough and about the lightest structural fabric on the market today. Kevlar is highly resistant to impact but it is rather difficult to work with for hand layup applications and its compressive strength is considered poor. Graphite fibers are created by extreme stretching and heating of rayon fibers to change their molecular structure. Graphite has very low density (weight/unit volume), is very stiff (high modulus) and very strong (high tensile). S glass uses a different chemical formulation from standard E glass fabrics, and is stronger, tougher and stiffer than E glass. One ply of S glass can replace several plies of E glass, which can result in a stronger and considerably lighter aircraft component. Ceramic fabrics are the latest innovation in advanced composites. These fabrics produce laminates approaching the qualities of S glass plus they can withstand temperatures of almost 3000°F. Ceramic cloth can produce a very lightweight and effective firewall laminate, although at this time the cost is high. These advanced composite materials are currently being used in the production of such items as aerospace components, high-performance boats and race cars, and many revolutionary homebuilt aircraft such as the Long-EZ, Solitaire, Sea Hawk and Q200. The performance of future homebuilt aircraft will most certainly be incredible with the availability of these innovative new composite materials.

### WHICH ONE DO YOU CHOOSE?

Often the choice of the materials to use for a laminate is difficult because of the required properties. One must consider the advantages of one material over another and its anticipated performance. S glass is about 30% stronger and 15% stiffer than E glass. It has 20-25% of the stiffness of graphite and is as strong, but it is also 30% heavier. S glass though, has only half the strength and stiffness of Kevlar and twice the weight. Kevlar on the other hand, is 40% stronger and 25% lighter than graphite but has only half the stiffness of graphite. Sometimes, blending different advanced composite fabrics in a laminate can achieve the proper balance of stiffness, strength and weight. Use the following six parameters listed here, from a best to a worst case, to help you decide which advanced composite fabric(s) is best for your application.
COMPOSITE MATERIALS

HELPFUL HINTS AND PRECAUTIONS

It is important to have the entire work area including tables, foam, tools and working materials thoroughly warm before commencing. This may take 3-4 hours. An electric hair dryer may be used to warm local areas, being careful not to overheat the part or epoxy. When, due to cool temperatures, a part is slow to wet out, a quick pass with a hair dryer will greatly speed the layup time. Do not use a hair dryer to heat a cup of epoxy. This can give local hot spots and ruin pot life.

The epoxy system components should be stored at room temperature. Never keep resin or hardeners in a cold place, even for long-term storage. If the resin appears to crystallize and settle out it should be returned to its normal state as soon as possible, even if prompt usage is not anticipated. Placing the container of resin in hot (160-190°F.) water for several hours will usually decrystallize it and return it to a clear state. Mild agitation will accelerate the process. Leaving the resin hot for 3-5 hours after it clears will reduce its susceptibility to recrystallize. Securely close containers after use.

Never attempt any layup below 70°F, since the higher viscosity of the resin will make it more difficult to wet out the cloth. Ideal working temperature is 85°F. Keep epoxy at 75° to 85°F. Never work outside in sunlight. It’s acceptable to work in a shop with radiant heaters, as long as:
1.) The heat is diffused and the heat source does not become much hotter than the ambient.
2.) The heat is not provided by a source that generates particulates or aerosol hydrocarbons.

Never make a glass layup over a core that is not straight and smooth. The glass panel cannot take the loads if it has bumps or depressions in excess of the allowable values. A wrinkle, depression or bump in a layup which is greater than 1/16” high or low and which is more than 20% of the chord length or 20% of the spar chord is not acceptable and requires repair. A depression can usually be repaired by filling with epoxy to level and laying over the entire depression the amount of glass that is underneath, lapping outside the depression a distance equal to one inch per ply. Care should be taken not to lay up a depression or bump in the thick main spar caps. The transition of the spar caps into the wing fittings must be smooth and with out joggles. These precautions apply only to the flying surfaces. The fuselage and fuel tanks can have relatively large depressions or bumps with out affecting structural safety. Care should be taken in the finishing process not to sand through more than one ply on the structure.

Joining foam blocks - (1) Paint a coat of epoxy (no micro) on the joining surfaces. (2) Trowel a wedge of dry micro on the center of one surface. (3) Squeeze the joining surfaces together, zigging them back and forth to obtain a thin micro joint less than 1/16” thick. It is desirable to have the micro about 3/8” low in the joint (not squeezed out). The low joint is filled with micro before glass is laid over the joint allowing a wet bond between the micro and the glass. If some does squeeze out, wipe the joint low with a mixing stick. Do not try to fill large voids with micro, as there is a possibility of exotherm damage. For a void larger than about 0.1”, fill with a sliver of foam with micro on each side.

- A paper cutter is excellent for measuring and cutting the many little squares of glass cloth.
- Epoxy should be removed from metal tools or parts with acetone, MEK or soap and water before it cures.
- Micro slurry should not be applied to glass surfaces being bonded. This weakens the joint.
- Do not use Bondo on styrofoam. It has a polyester base which will dissolve the foam. Bondo will not attack urethane or PVC.

Precaution - Be sure layups are not dry, with air present ( small flecks of white). Inspect thoroughly before leaving a wet layup. A cured layup that is too dry must be rejected.

Make sure that ample micro slurry is applied over the foam, particularly the urethane. Inadequate slurry allows air to remain under the first ply, decreas ing laminate peel strength and surface durability.

Hot wire cutting - A good method to use for judging wire temperatures is the appearance of the cut foam surface. A cratered or rutted surface indicates the wire is too hot. A very light “hair” of plastic strands on the surface is just right. Always adjust the temperature so that the wire will cut one inch in 4 to 6 seconds with light pressure.

Exotherm foam damage - Care must be taken to avoid heavy buildups of epoxy/micro down inside a joint that is insulated by foam, such as the assembly of the wing cores. The gap to be filled by micro when semi crystallizing foam cores should not be thicker than 1/16”. In filling a gap greater than 0.1”, excessive weight is added and, more importantly, the large mass of epoxy/micro insulated by the foam can exotherm. Heat resulting from the exotherm can be as high as 450°F., which will melt away the foam locally and destroy the joint. White is the recommended color for composite aircraft since it absorbs very little of the sun’s heat (10%) while a black surface will heat up tremendously (95% absorption). Trim colors in noncritical areas are acceptable. Any good quality automotive enamel, lacquer, acrylic or polyurethane is acceptable. A primer-surfacer with an ultra-violet radiation barrier is recommended as an undercoating.

Caution: Do not ever wipe paint thinners on any part of the structure. Minute pin holes in the epoxy/glass skin can allow the thinners to penetrate down to the styrofoam, which dissolves in thinners.

QUALITY CONTROL

One of the unique features of the glass-foam-glass composite construction technique is the ability to visually inspect the structure from the outside. The transparency of the glass/epoxy material makes it possible to see all the way through the skins and even through the spar caps. Defects in the layup can give local hot spots and ruin pot life. The weave pattern describes the manner in which the warp yarns and the filling yarns are interlaced in the fabric.

Plain Weave consists of one warp end woven over and under one filling pick. Plain weave is generally characterized by fabric stability with minimum pliability except at low fabric counts.

Crowfoot Weaves are constructed with one warp end weaving over three and under one filling pick. It is characterized by being more pliable than either plain or basket weaves, having conformability to complex or compound curved surfaces and making possible the weaving of higher counts than plain or basket weaves.

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Fiberglass cloth is exactly what the name says - glass. Fine fibers are spun from molten glass marbles, gathered into yarn and woven into a strong, supple glass fabric. It can be folded, rolled or draped, like any other loosely woven fabric - but it can be chemically transformed into solid sheets of tremendous strength. All the fiberglass fabrics listed below are chosen for maximum strength and resistance to moisture and abrasion. They feature a weave that is tight enough for high strength, yet open enough for thorough wetting by resins.

**S-2 UNIDIRECTIONAL FIBERGLASS TAPES**

A unidirectional fabric constructed with Owens-Corning Fiberglass S-2 Glass offering outstanding strength-to-weight ratio, superb glass-resin ratio control to minimize probability of resin-rich and resin-dry areas, handleability without distortion and exceptionally high impact resistance. The integrity of the S-500 is maintained through very fine, adhesive coated fill yarns that are bonded to but not interwoven with the unidirectional fibers of the S-2 Glass. The fill yarns are spaced approximately 1.5 inches apart. The use of short-nap paint rollers is suggested, rolling under pressure, always parallel to the fibers. Use with epoxies, vinyl esters and polyesters. Weight of fabric - 0.56 Lbs. per Sq. Yd. Tensile Strength (hand layup in polyester, air-cured) - 128,000 PSI. Thickness .016". Sold by the foot.

**NOMEX HONEYCOMB**

AHN 7800 is a Commercial Grade Nomex honeycomb particularly suited for use where resistance to corrosive attack and moisture are important. This material exhibits good strength characteristics and is fire resistant. It is available in a variety of cell sizes and densities to suit most purposes. Typical applications include lightweight non-structural bulkheads for ships, joiner panels, shelters, antennas, and auto body panels. This material is not intended for aircraft or aerospace applications. This material also exhibits good thermal insulation properties and also has good dielectric properties. This honeycomb is easily machined, formed, and shaped and well suited to adhesive bonding.

**KNITTED E-GLASS FABRIC**

Knitted fabrics are a relatively new format in composites. The performance of the glass is greatly enhanced by removing the interstices of the woven fabric and the cramped condition. E-glass in woven goods normally has 22,000 psi tensile strength. Layered non-woven goods give 27,000 psi which is about a 20% improvement. Knitted glass offers greater ease of fabric orientation and saves time over multi-layered wet lay-ups.

**GLASS MAT**

Grade "B" cotton is manufactured to the specification of Grade "A" cotton - with the same thread count, burst strength and shrink characteristics - but has either not been tested for compliance with MIL-C-5648 or has failed the test in some aspect. Consequently we do not recommend that it be used for covering anything but a static display.

**STANDARD E-GLASS FIBERGLASS CLOTH**

Fiberglass cloth is exactly what the name says - glass. Fine fibers are spun from molten glass marbles, gathered into yarn and woven into a strong, supple glass fabric. It can be folded, rolled or draped, like any other loosely woven fabric - but it can be chemically transformed into solid sheets of tremendous strength. All the fiberglass fabrics listed below are chosen for maximum strength and resistance to moisture and abrasion. They feature a weave that is tight enough for high strength, yet open enough for thorough wetting by resins.

**COMPOSITE MATERIALS**
COMPOSITE MATERIALS

RUTAN FIBERGLASS CLOTHS

The most basic structural material in building a composite aircraft is glass cloth. The use of glass in aircraft structures, particularly structural sandwich composites, is a recent development. Glass cloth is available commercially in hundreds of different weights, weaves, strengths and working properties. Very few of these, however, are compatible with aircraft requirements for high strength and light weight.

Aircraft glass fabric comes in large rolls of cloth that is laminated into layers for use in constructing composite parts. Each layer of cloth is called a “ply.”

UNIDIRECTIONAL P/N RA7715
7 Oz. 38” Width Threads per inch:
80L x 18W .Lineal Yd.

Small Cross Fibers

Selvage Edge

Major Fiber Bundles

Selvage Edge

BIDIRECTIONAL P/N RA7725
8.8 Oz. 38” Width Threads/inch:
54L x 48W .Lineal Yd.

Quantity Discount: 15% on 500 Yds. or more. Yardage must be on one fabric for discount, not combined. Discount on larger quantities quoted on request.

BI-DIRECTIONAL KEVLAR

“Kevlar” 49 aramid fiber was introduced commercially in 1972 and is the Du Pont registered trademark for its new high strength, high modulus organic fiber. It combines high tensile strength (43,000 PSI) and high modulus (19 million PSI) with light weight and toughness superior to other reinforcing fibers for plastics. It is available in yarns and rovings which meet all FAA requirements for flammability. It shows no degradation in jet fuel, lubricating oils, water, salt water or high humidity. At cryogenic temperatures (-320°F.) performance is excellent with essentially no embrittlement or degradation of fiber properties. Kevlar 49 can offer both a significant weight saving and improved stiffness versus glass in addition to superior vibration damping and good impact resistance. A kayak made with Kevlar 49, for example, weighs about 18 pounds while the weight of a comparable boat made with glass would be over 30 pounds. The advantages over glass in small aircraft are similar - weight savings and improved impact resistance. Kevlar 49 is used in a number of parts on the Lockheed L-1011 because of weight savings of up to 30% compared to similar parts made of glass. One unusual benefit would be over 30 pounds. The advantages over glass in small aircraft are similar - weight savings and improved impact resistance. Kevlar 49 is used

UNIDIRECTIONAL KEVLAR

KS-400 is a unique unidirectional reinforcing material combining the benefits of Kevlar 49 with Owens-Corning Fiberglass S-2 Glass. Designed for use in laminates which must have high modulus or stiffness and tensile strength combined with low weight or density. Specifically constructed to enhance properties of wet-out behavior, bondability and impact strength in a hand-laid-up composite. As compared with woven fabrics of pure Kevlar, KS-400 should produce laminates with better fiber-resin ratios and superior stiffness. The integrity of KS-400 is maintained through very fine, adhesive coated Dacron fill yarns that are bonded to, but not interwoven with, the unidirectional fibers. Only vinyl esters or epoxies should be used as impregnating resins. The presence of the S-2 Glass enables the fabricator to determine visually when the material is properly wet out. Resin bond is far superior to the glass than to the Kevlar. This means increased resistance to delamination. Also the presence of the S-2 Glass even in such a relatively small amount increases the impact strength of the laminate significantly. In application, it is important that the fabricator does not confuse the appearance of the cross-directional adhesive binder with air bubbles. The impregnating resin will soften this adhesive and it will flow slightly. The adhesive shows up as milky areas on both sides of the fabric within the finished laminate. A gel coat or paint covers these areas effectively. 12” Wide …………P/N 01-00340……………………Ft

INDUSTRIAL FABRIC SHEARS

Wiss No. 20W heavy-duty shears, ideal for cutting fiberglass cloth and all fabrics. Hot drop-forged steel.

ECONOMY KEVLAR SCISSORS - GINGHER® Scissors cut Kevlar exceptionally well. Lightweight, extremely sharp and comfortable, these 2 1/2 oz. scissors are perfect for use during the lay-up. Soak in acetone for easy clean-up. We recommend saving one pair for only cutting Kevlar®, and keep ing a second pair for general use. P/N 01-00342……………………
Woven graphite is a fabric introduced in recent years which has become an excellent alternative to fiberglass and Kevlar - only mill thick with great strength. In addition to its great strength, graphite fabric also has very low density and is very stiff. Although it is quite costly, the material saving is appreciable since only the course of graphite required for 3 or 4 of fiberglass. It cuts considerably easier than Kevlar. Graphite "Prepregs", which are standard graphite weaves impregnated with either polyester or epoxy resins, have been used by major manufacturers to cut production time on composite parts. The required equipment and precise production controls for proper cure of prepregs make them difficult to adapt to homebuilt applications. The excellent qualities of the graphite fabric itself give it an immediate waiting market in the aircraft building field.

Graphite fabric is stocked in the three different styles shown below. Other weights and weaves of graphite are available on a special order basis. Be sure to specify the graphite style when ordering. The carbon graphite cloths are not pre-preg fabrics. * Warning folding for shipment can damage the filaments in the fabric. Folding will be done at customers request and request only.

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Woven graphite is similar to the bidirectional woven graphite described above but is a unidirectional weave using standard 3000 tow graphite warp and 75-100 fiberglass fill.

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These graphite fibers are easily airborne. A filler mask should be worn when cutting and fabricating. This graphite fabric is similar to the bidirectional woven graphite described above but is a unidirectional weave using standard 3000 tow graphite warp and 75-100 fiberglass fill.

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### UNIDIRECTIONAL CARBON TAPES

These carbon fiber tapes are used to add stiffness and tensile strength in one direction without adding significant thickness or weight. These fiber West System tapes have 12 carbon fiber bundles per inch of tape width. The bundles are held together with a polyester fill thread making the tape easy to handle. These tapes are compatible with epoxies but not with vinylesters or polyester resins. #702 tape is 1.5" wide and #703 tape is 3" wide.

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These carbon fiber tapes are used to add stiffness and tensile strength in one direction without adding significant thickness or weight. These fiber West System tapes have 12 carbon fiber bundles per inch of tape width. The bundles are held together with a polyester fill thread making the tape easy to handle. These tapes are compatible with epoxies but not with vinylesters or polyester resins. #702 tape is 1.5" wide and #703 tape is 3" wide.

### CARBON FIBER TAPES

<table>
<thead>
<tr>
<th>Style No.</th>
<th>Weight Oz./Sq. Yd.</th>
<th>Width (in.)</th>
<th>Part No.</th>
<th>Price per Lin. Yd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>702</td>
<td>1.5</td>
<td>60 ft. Roll</td>
<td>01-00239</td>
<td>$0.00571</td>
</tr>
<tr>
<td>703</td>
<td>3</td>
<td>60 ft. Roll</td>
<td>01-00241</td>
<td>$0.00641</td>
</tr>
</tbody>
</table>

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<tr>
<td>702</td>
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<td>60 ft. Roll</td>
<td>01-00241</td>
<td>$0.00641</td>
</tr>
</tbody>
</table>
CARBON GRAPHITE YARN TOW
High strength (470,000 PSI) carbon fibers are used as reinforcement in high performance structural composites for aircraft applications, recreational and industrial products. Carbon fiber filaments are finer than a human hair. These filaments are bundled together to make a fiber of 3,000, 6,000 or 12,000 filaments which is called a "tow". The tow is sized with an epoxy compatible material to improve the handling characteristics. It is then wound on a cardboard core holding from 4 to 6 pounds of fiber. 1 lb. spool.

<table>
<thead>
<tr>
<th>Package Size</th>
<th>Part Number</th>
<th>Approx. Yield</th>
<th>Roll Size</th>
<th>Price/Spool</th>
</tr>
</thead>
<tbody>
<tr>
<td>3K Tow</td>
<td>01-000343</td>
<td>2470 Yd./Lb.</td>
<td>4 Lb.</td>
<td></td>
</tr>
<tr>
<td>6K Tow</td>
<td>01-000307</td>
<td>1229 Yd./Lb.</td>
<td>1 Lb.</td>
<td></td>
</tr>
<tr>
<td>12K Tow</td>
<td>01-000345</td>
<td>521 Yd./Lb.</td>
<td>4 Lb.</td>
<td></td>
</tr>
</tbody>
</table>

It appears that the 6K tow will prove most practical for homebuilding applications. This size will be available in the small units shown. The 3K and 12K sizes are offered in full spools only. The 3K tow is used primarily by weavers. The 12K is difficult to wet out but can be done by diligent brushing.

S-Glass Roving Filaments
This is the S-Glass Strand (roving) used by Rutan Aircraft Factory on the Defiant homebuilt kits. Also applicable to other homebuilt aircraft applications. Defiant requires four 15lb. rolls of S-Glass Strand.

KEVLAR 49 ROVING
Unidirectional Aramid fiber roving. Type 986, 7100 denier, comprised of five strands of 1420 denier. Used in the popular geodesic dacron kayaks and boats by Platt Monfort, this roving has a wide variety of applications.

FIVE-MINUTE EPOXY
Epoxide 9935 is a clear, 2 component room temperature curing epoxy system with a four minute gel time. It is an excellent adhesive for composite and wood applications, has very low shrinkage, and provides excellent machinability. Shelf life: 1 year.

SYSTEM THREE QUIKFAIR EPOXY FAIRING PUTTY
Lightweight, micro balloon filled, fast curing 2-part epoxy fairing putty with excellent moisture resistance. Use on both fiberglass and wood epoxy structures above or below the waterline. At 70°F it is sufficiently cured to be hand sanded in 3 hours or machine sanded in 4 hours. This allows you to apply 3 coats in a standard 8 hour shift or 6 in a round the clock basis. Complete a fairing shift or 6 in a round the clock basis. Complete a fairing job in 1 day rather than 3 or 4 days. NOTE: QuikFair warm butter-like consistency makes it easy to measure by weight. Use care when measuring by volume as QuikFair does not self-level and may trap air pockets. As QuikFair is fast curing the working time is short. Mix no more than can be applied within 10 minutes.

EPoxy PREMIUM PIGMENTS
These Premium Pigments are a paste to tint polyesters, vinyl ester, epoxy resin, and polyurethane. Add about 6% to 8% of pigment by weight or 1/2 pint of pigment per gallon of resin.
- White - 1 oz. P/N 01-45308
- White - 8 oz. P/N 01-45501
- Black - 1 oz. P/N 01-45319
- Black - 8 oz. P/N 01-45512

JEFFCO Epoxy Laminating System
1307 Low Viscosity Resin / 3102 Fast Hardener - 100% solids 2-component epoxy laminating system with excellent wet out, low viscosity and high strength. Very low odor and toxicity. Easy to use. 4:1 weight or volumetric mixing, safe, fast curing products for a variety of use applications. Used for fast curing, penetrating wood coatings, adhesives and sealers, fiberglass laminating and microsphere filled fairing compounds. Excellent cold temperature cures down to 40°F. No solvents or VOC's. Non-hazardous, non-corrosive hardener.


Low Viscosity Laminating Resin
1307 LV, Pail (40 lbs) P/N 01-07917
1307 LV, Gallon (8 lbs) P/N 01-07914

Fast Hardener
3102, Pail (40 lbs) P/N 01-07920
3102, Gallon (8 lbs) P/N 01-07918
3102, Quart (2 lbs) P/N 01-07915

Medium Hardener
3176, Pail (40 lbs) P/N 01-07921
3176, Gallon (8 lbs) P/N 01-07922
3176, Quart (2 lbs) P/N 01-07923

KITS - Jeffco Epoxy, 1 gal. kit, fast P/N 01-07916
Jeffco Epoxy, 5 gal. kit, fast P/N 01-07919
Jeffco Epoxy, 1 gal. kit, medium P/N 01-07924
Jeffco Epoxy, 5 gal. kit, medium P/N 01-07925

AEROPOXY LIGHT Patching/Filler Compound
AeroPoxy Light, a modification of the ES6279 adhesive system, is a 2-component paste epoxy patching and filler compound for foam, wood, fiberglass and other surfaces. The mixed consistency of this system is very smooth and creamy, so it spreads easily, and can be spiced to a feather edge without separation. It is a thixotropic, non-sag material that will remain in place in thick sections, even when applied upside down! The resin and hardener of this system are color coded for easy mixing. The resin is white and the hardener is brown, giving a good visual indication of complete mixing with a uniform tan color free of streaks. AEROPOXY LIGHT has special low density fillers incorporated into it that provide very distinct benefits. It is a very light material (4 pounds per gallon), and therefore contributes minimal added weight to the filled or repaired structure. Also, the cured material is very easy to sand, making the finished patch undetectable when covered or painted. There are no volatile ingredients in AEROPOXY LIGHT, so the cured material will not outgas, which could cause a loss of adhesion of paint or coverings. Sold in kits of part A & B.

1-1/2 lb. Kit P/N 02-30006
6 lb. Kit P/N 02-30007

IMPACT RESISTANT LAMINATING EPOXY
DLRH-3212 is an unfilled, clean epoxy resin system with a long pot life. DLRH-3212 is a tough, strong, impact resistant resin with chemical resistance. It has excellent wetting quality on kevlar, carbon graphite and fiberglass cloth. Used extensively in construction of aircraft, race cars, motorcycles, helmets and sports equipment. Mixing Ratio by Weight: 100:30; Pot Life (200 Gm MASS) 60 Min; Tensile Strength @ 25°C 12,500; Flexural Modulus @ 25°C 40,900; Heat Deflection 325°F; Shore “D” 90; Density: Resin 9.7, Hardener 7.9, Mixed: 9.1; Shelf Life: Resin/ Hardener 1 Year.

CM P/N 01-00430
Gal Kit P/N 01-00431
5 Gal Kit P/N 01-00432
POLY EPOXY
STRUCTURAL EPOXY SYSTEM
Poly Epoxy is a true high-performance epoxy resin with unmatched tensile, compressive, and flex strengths. It also has an unbeatable peel, shear, and fatigue resistance, as well as impact strength and fracture behavior. It’s great for wings, canards, fuselages, tail feathers, and landing gear. Use it in molds or moldless construction. It parts easily and works beautifully in vacuum bagging. (Avoid silicone-treated peel ply.) It has TWO cure phases, while all other resins—epoxy, polyester, or vinyl ester—have just one. The two phases occur all by themselves during the curing process. The resulting bond is tougher and stronger than any other.

Poly Epoxy Kit, quart................. P/N 01-07905
Poly Epoxy Kit, gallon............... P/N 01-07906

POLY EPOXY TECHNICAL DATA
Mechanical Properties: w/Post Cure w/o Post Cure
Tensile Strength, psi 9600 8800
Elongation at Break, % 7.5 3.6
Tensile Modulus, psi 470,000 460,000
Flexural Strength, psi 13,000 14,500
Flexural Modulus, psi 515,000 500,000
Compressive Strength, psi 32,000 33,000
Shore D Hardness 52 70
Glass Transition Temp., °C 72 62
Heat Distortion Temp., °C 64 50
Water Immersion Weight Gain, % (140 °F, 30 days) 2.8 2.9

Rheology: Mixing Ratio:3 parts Resin to 1 part Converter by Weight

AlphaPoxy uses a non-MDA hardener that allows us to ship it as non-

POLYESTER GEL COATS

These polyester gel coats can be used as the surface of new fiberglass parts laid up in molds or used in the repair of gel coat surfaces on fiberglass parts. On surface repairs, the gel coat must be sealed to fully cure. PVA can be used to seal the gel coat.

EPOXY LAMINATING SYSTEMS

E-Z POXY
EPOXY LAMINATING SYSTEMS
In early 1996, Composite Design Co. developed E-Z Poxy to provide a replacement epoxy system for Epolete (Safe-T-Poxy) which is no longer produced by Hexcel. The E-Z Poxy series of laminating systems utilizes one resin and your choice of three hardeners for varying pot life and viscosity requirements. The E-Z Poxy systems offer the same handling and physical properties as the discontinued Epolete systems including ease of use, long pot life, rapid cure for demold or process continuation, and superior room temperature curing properties. Excellent for use in sport aviation, marine, and industrial applications.

E-Z 83 hardener is equivalent to Safe-T-Poxy standard hardener, E-Z 84 is equivalent to Safe-T-Poxy II hardener, and E-Z 87 is equivalent to Safe-T-Poxy slow hardener. E-Z Poxy products should not be mixed with materials produced by other epoxy manufacturers.

E-Z POXY PRICE LIST

Description Part No. Price
E-Z Poxy 1-1/2 gal. kit* 01-07850
E-Z Poxy 5 gal. kit** 01-07950
E-Z Poxy II 1-1/2 gal. kit* 01-08850
E-Z Poxy II 5 gal. kit** 01-08950
E-Z Poxy 1 gal. resin 01-00245
E-Z Poxy 5 gal. resin 01-00246
E-Z Poxy 1/2 gal. hardener 01-00247
E-Z Poxy 1 1/2 gal. hardener 01-00248
E-Z Poxy II 1 1/2 gal. hardener 01-00249
E-Z Poxy 2-1/2 gal. hardener 01-00250
E-Z Poxy II 2-1/2 gal. hardener 01-00251
E-Z Poxy 5 gal. hardener 01-00251
E-Z Poxy 5 gal. hardener 01-00252
E-Z Poxy slow 1/2 gal. hardener 01-00253

E-Z POXY TECHNICAL DATA

E-Z POXY RESIN SYSTEMS FROM COMPOSITE POLYMER DESIGN

E-Z 10 Epoxy Resin

E-Z 83 Aromatic Amine Hardener
Hardener

EZ 83 Aromatic Amine Hardener
E-Z 84 Aromatic Amine Hardener

E-Z 10 Resin (Viscosity* 1500 cps @ 77°F with:

Hardener
EZ 83 EZ 84 EZ 87

Mixed Properties:

E-Z Poxy Resin Mix Properties:

Viscosity cps @ 77°F 1300 800 1000
Viscosity Hardener cps @ 77°F 410 140 830
Pot Life @ 77°F 2 hrs. 2 hrs. 5 hrs.
Tack Free @ 77°F 4 hrs. 8 hrs. 8 hrs.
Cure Time @ 77°F 24 hrs. 3 days 3 days
Mix Ratio by Volume 100/47 100/47 100/47
Mix Ratio by Weight 100/44 100/44 100/44

Physical Properties Tg (F):
R/T 151 151 142
P/C* 196 196 196

Elongation % 3.5 3.5 3.9
Specific Gravity 1.14 1.13 1.14
Linear Shrinkage @ 23°C (4 days %) .10 .10 .10

Tensile Strength PSI
R/T 8,200 8,100 8,400
P/C 10,000 10,000 10,000

Tensile Modulus (PSI x 10^-5) 4.8 4.2 4.0

* Viscosity may vary +/- 10%
* Post Cure for 2 hrs. @ 150°F

E-Z Poxy systems provide excellent room temperature curing systems for hand layup of composite parts and tooling. The systems are designed to provide ample working time with the varied pot life options while providing a rapid finish cure. Post curing these systems will increase their physical properties as designated in the above data, however, post cure is not required.

Color Size P/N Price Color Size P/N Price
Black Pint 09-01663 . Dark Pint 09-01670 .
Quart 09-01664 . Clear Quart 09-01690 .
Gallon 09-01667 .
Blue Pint 09-01663 .
Quart 09-01664 .
Gallon 09-01667 .
White Pint 09-01663 .
Quart 09-01664 .
Gallon 09-01665 .

* Post Cure for 2 hrs. @ 150°F

Available exclusively from Aircraft Spruce
POLYESTER RESINS

Polyester resins are hygroscopic (they draw moisture from the air). There are two types of resins, and one or both types may be required, depending on the application. Type “A” resin has a small amount of wax in it, which comes to the surface and forms a barrier against the moisture. This permits the resin to cure completely and the surface is hard and easily sanded. Bond Coat “B” resin does not have any wax content. As a result the surface stays a little tacky, as the surface cure is being inhibited by moisture. This tacky surface provides excellent adhesion between coats. Bond Coat resin is therefore recommended for the first coat of resin to fill the weave of the glass cloth, for bonding fiberglass cloth to plywood or other surfaces and for multi-layers of glass cloth.

TYPE “A” RESIN

#1520-5 is a general purpose ortho surfacing resin intended for the finishing coat applied over the Bond Coat #1063-5, or for single coat application. A second coat may be applied after full cure and thorough sanding but is not recommended. Polyester Resin #692 Quart...P/N 01-00346
1 Gal. #1520-5 with 4 Oz. Catalyst...P/N 01-00347
5 Gal. #1520-5 with 4 Oz. Catalyst...P/N 01-00348
Additional catalyst may be required. 1 Oz. ...P/N 01-06900 4 Oz. ...P/N 01-07325

TYPE “B” RESIN

#L25T-20 is a general purpose bond coat ortho resin for use in making multi laminates. It will not cure to a high gloss finish. Use 1520-5 for finish coat to obtain smooth, hard gloss finish. Replaces #1063-5.
1 Gal. #L25TST-20 with 1 Oz. Catalyst...P/N 01-00349
5 Gal. #L25TST-20 with 4 Oz. Catalyst...P/N 01-00350
Additional catalyst may be required.

System used for #1520-5 and #L25TST-20.
Note: Use #1520-5 finish coating over #L25TST-20 but never use #L25TST-20 over #1520-5.

Above resins are not for use in making fuel tanks. For fuel tanks (except those for gasohol) use #6060-5 Isophthalic Resin.

Gallon...P/N 01-00345
1/2% 9 drops 18 drops 36 drops
1% 18 drops 36 drops
2.5 cc 5 cc 7.5 cc 10 cc
2% 36 drops

MGS EPOXY RESINS

MGS epoxy resins are approved for the production of certificated aircraft parts. The 335 and 285 systems are especially suited for homebuilders because of their long shelf lives, excellent workability, physiological friendliness, adjustable cure rates and excellent static and dynamic strength characteristics. The 285 system is available with fast and slow hardeners which can be blended with each other in any proportion to provide the desired working life and cure cycle. Pot lives and working times can be adjusted from fifteen minutes, using the fast hardeners, to six hours, when the slow hardeners are employed. Once the hardeners have been blended, the selected resin to hardener mixing ratio must be maintained. The 335 System is available only with fast hardener. Components of the 335 system should not be mixed with those of the 285 system. With both systems, if only the slowest hardener is used, the cure times should be extended to a few days, otherwise some brittleness may be noted. While room temperature curing results in good properties when the faster hardener combinations are used, some curing at elevated temperatures or post cure will result in the highest achievable strength and Tg, with the slower blends. Even unfavorable low temperature and high humidity conditions in the work environment will not effect the quality of the product and high gloss, uncontaminated, tack free surfaces are achievable every time. The resins do not contain any reactive diluents which with many systems result in de-gassing and bubbling of the painted finish. The MGS resins do NOT contain aromatic amines. While proper processing practices should be maintained, the physiological friendliness of these systems have been demonstrated by many years of production experience. The 285 system has slightly higher physicals than the 335 but will also achieve a higher maximum Tg after post curing. While the 335 is more viscous than the 285, after mixing with the appropriate hardeners, their viscosities are comparable. MGS systems are used in the construction of the Cozy, Diamond, Cirrus and other aircraft.

System 285 (Max. Tg 105 C - 110 C; 199 F - 230 F)

<table>
<thead>
<tr>
<th>Mixing ratio Resin:Hdnr</th>
<th>Pot life</th>
<th>Mixed Viscosity @20C</th>
</tr>
</thead>
<tbody>
<tr>
<td>100:50 by volume</td>
<td>H285-F</td>
<td>40 min</td>
</tr>
<tr>
<td>100:40 by weight</td>
<td>H285-S</td>
<td>4 hours</td>
</tr>
</tbody>
</table>

System 335 (Max. Tg 75 C - 80 C; 160 F - 180 F)

<table>
<thead>
<tr>
<th>Mixing ratio Resin:Hdnr</th>
<th>Pot life</th>
<th>Mixed Viscosity @20C</th>
</tr>
</thead>
<tbody>
<tr>
<td>100:45 by volume</td>
<td>H335-F</td>
<td>15 min</td>
</tr>
<tr>
<td>100:38 by weight</td>
<td>H335-S</td>
<td>6 hours</td>
</tr>
</tbody>
</table>

Two units of hardener are required for each gallon of resin.

Typical room-temperature properties of clear castings made with DERAKANE 411 resins

<table>
<thead>
<tr>
<th>Property</th>
<th>DERAKANE 411-350PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength, psi</td>
<td>11-12,000</td>
</tr>
<tr>
<td>Tensile Modulus, units 105 psi</td>
<td>4.9</td>
</tr>
<tr>
<td>Elongation, %</td>
<td>5-6</td>
</tr>
<tr>
<td>(DERAKANE 411-350)</td>
<td>(7-8)</td>
</tr>
<tr>
<td>Flexural Strength, psi</td>
<td>16-18,000</td>
</tr>
<tr>
<td>Flexural Modulus, units 105 psi</td>
<td>10-15</td>
</tr>
<tr>
<td>Compressive Strength, psi</td>
<td>16-17,000</td>
</tr>
<tr>
<td>Compressive Modulus, units 105 psi</td>
<td>3.5</td>
</tr>
<tr>
<td>Compressive Deformation at Yield, %</td>
<td>6-7.5</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.12</td>
</tr>
<tr>
<td>Heat Distortion Temp.,°F</td>
<td>210-220</td>
</tr>
<tr>
<td>Barcol Hardness</td>
<td>35</td>
</tr>
</tbody>
</table>
EPOXY LAMINATING SYSTEMS

PR2032 is a medium viscosity, unfilled, light amber laminating resin that is designed for structural production applications. 3 hardeners are available for use with PR2032. PH3660, has a 1-hour pot life. When used with either of these hardeners, the system gives excellent wet-out of fiberglass, carbon and aramid fibers. Special additives have been incorporated into this system to promote chemical adhesion to fabrics made with these fibers. The AEROPoxy systems will cure completely at room temperature, or can be given an elevated temperature cure. AEROPoxy contains no MDA (a known liver toxin and carcinogen) and meets or exceeds current OSHA requirements for safe use. Hardener PH3665 has a longer pot life than PH3660, 2 hours, that is useful for vacuum bagging larger parts before the resin has gelled. Hardener PH3630 is intended for smaller laminates, fast repairs or additions to a primary structure. PH3630 pot life is 30 min.

WEST SYSTEM EPOXY
WEST SYSTEM brand resins and hardeners, form a two-part epoxy system developed by Gougeon Brothers specifically for wood and composite boat construction. Rutan Aircraft Factory now recommends WEST SYSTEM epoxy for certain homebuilt aircraft applications, particularly where a moisture resistant epoxy is desired. 105 Resin is the base material on which all of the WEST SYSTEM epoxy systems are built. The resin is a clear, light amber, low-viscosity liquid. It is designed specifically to wet out wood fiber. With roller applications, it possesses excellent thin film characteristics in flowing out and is self-leveling without fish-eyeing. Its relatively high flash point makes it safer to work with than polyesters. It can be cured in a wide temperature range, then sanded and shaped. It cures quite clear so that the natural finish shines through. 205 Fast Hardener, when mixed with the 105 Resin in a ratio of 5 parts Resin to 1 part Hardener, yields a high-strength, rigid solid with excellent cohesive properties and provides an excellent moisture vapor barrier. The 105 Resin/205 Fast Hardener has a pot life of 10-15 minutes at 70°F. It is also recommended in coating applications where natural finishing is desired. Partial cure time at 70°F is 5-7 hours. 206 Slow Hardener is a low-viscosity mixture of polyamines. The 105 Resin/206 Slow Hardener has a pot life of 30-40 minutes at 70°F. It is normally used when extended time is needed for large coating and bonding applications. It is especially well suited to working in warmer climates. Partial cure time is 9 hours at 70°F.

WEST EPOXY KITS

Kit No.  Kit Size  Part No.  
A-1  1.2 Qt  01-08100  
A-2  1.2 Qt  01-08200  
B-1  1.2 Gal  01-08300  
B-2  1.2 Gal  01-08400  
C-1  5.25 Gal  01-08500  
C-2  5.25 Gal  01-08600  

207 SPECIAL COATING HARDENER
This hardener is used where a very clear, moisture resistant natural wood finish is needed. Can be used to laminate veneers where joints will be subjected to sunlight. Improves sun resistance. Pot life: 20 min., cure solid in 9-12 hours, and maximum strength within 7 days. 66 pint. P/N 207-SC

209 TROPICAL HARDENER
This hardener is used for bonding applications in warm or humid weather or when extended working time is needed. Provides twice the working time as 206 hardener. Forms a clear, amber colored when cured. Pot life is 40 minutes, solid state in 24 hours, and maximum strength in 5-9 days. 66 pint. P/N 209-SC

PRO-SET 125 RESIN & 229 HARDENER
Mixing: 125 Resin: 229 Hardener - By weight, 100:30 & By volume, 100:35. Pot life: 60–83 min. 72°–77° min. 85°–27 min. For PROFESSIONAL use only.

ORDER 301/303 PUMP PACKS SEPERATELY.

WEST SYSTEM ACCESORY PRODUCTS
- West System User Manual P/N 01-08750
- West System 101 Handy Repair Pack - Contains 105 resin & 205 hardener plus accessories needed for small repairs P/N 01-08760
- West System #101-6 Maxi Repair Kit - incl. materials to make 6 individual repairs using 105 resin and 205 hardener P/N 01-08770
- West System 501 White Pigment - use this epoxy based pigment to provide a neutral white base for the final coloring system. Mix at ratio of 1 to 8 oz. of epoxy. 8 oz. can. P/N 01-08775
- West System 410 Microlight Graphite Powder can be mixed with WEST SYSTEM epoxy to produce a high-slip coating with increased scuff resistance and durability. 423 is often used as a bearing surface, and as a coating on the bottoms of racing craft that are dry sailed. P/N 09-00315

423 GRAPHITE POWDER
Using Mini Pumps helps ensure accurate metering of resin/hardener mixture. Pumps mount directly on resin and hardener containers. One stroke from each pump delivers proper ratio of resin to hardener. Kit consists of 3 pumps for A, B, and C epoxy kits. P/N 01-00318.
**FOAM**

**STYROFOAM – SMALL CELL**
STYROFOAM FB – Low density (2 lb./ft³). Tight closed cell structure leaves no voids between the cells. The result is high compressive strength and unequalled resistance to water penetration. Has excellent resistance to bases, salts, alcohols and most acids but not to petroleum based solvents. Cuts smoothly with a hot wire for airfoil shapes.

<table>
<thead>
<tr>
<th>Foam Type</th>
<th>Density</th>
<th>Thickness</th>
<th>Sheet Size</th>
<th>Part No.</th>
<th>Price/Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrofoam (Blue)</td>
<td>2 Lb/Ft</td>
<td>5/8&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-09400</td>
<td></td>
</tr>
<tr>
<td>Small Cell</td>
<td></td>
<td>5/8&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-09500</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-09600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-09700</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-1/2&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-09800</td>
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<tr>
<td></td>
<td></td>
<td>2&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-10000</td>
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<tr>
<td></td>
<td></td>
<td>2&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-10100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-10200</td>
<td></td>
</tr>
</tbody>
</table>

**POLYSTYRENE – LARGE CELL**
This blue large cell expanded foam is 2 lb. density and cuts easily using a hot wire to airfoil shapes. Compatible with most adhesives, but should be used only with epoxies, not polyester resins. Will dissolve in fuels and solvents.

<table>
<thead>
<tr>
<th>Foam Type</th>
<th>Density</th>
<th>Thickness</th>
<th>Sheet Size</th>
<th>Part No.</th>
<th>Price/Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polystyrene (Round Corners)</td>
<td>2 Lb/Ft</td>
<td>10&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-11100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-11200</td>
<td></td>
</tr>
</tbody>
</table>

**URETHANE –** This foam is easily contoured using a large knife, and then sands well to final form. Excellent for producing the fuselage, wing tips, and other curved parts. It is fuel resistant and can be used for fuel cells. Compatible with most adhesives. Do not hot wire polyurethane foam. Color: tan or green.

<table>
<thead>
<tr>
<th>Foam Type</th>
<th>Density</th>
<th>Thickness</th>
<th>Sheet Size</th>
<th>Part No.</th>
<th>Price/Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethane (Tan or Green)</td>
<td>2 Lb/Ft</td>
<td>1/2&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-11300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2&quot;</td>
<td>48&quot; x 48&quot;</td>
<td>01-11400</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-12150</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>3/4&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-12160</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-11500</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-11600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1&quot;</td>
<td>48&quot; x 96&quot;</td>
<td>01-11700</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-11900</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2&quot;</td>
<td>24&quot; x 96&quot;</td>
<td>01-12000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2&quot;</td>
<td>48&quot; x 96&quot;</td>
<td>01-12100</td>
<td></td>
</tr>
</tbody>
</table>

**DIVINYCELL –** A closed cell medium to high density foam which has high compression strength, durability, and excellent fire resistance. Can be vacuum formed to compound shapes and can be bent using heat. Compatible with polyester, vinyl ester, and epoxy resins.

<table>
<thead>
<tr>
<th>Foam Type</th>
<th>Density</th>
<th>Thickness</th>
<th>Sheet Size</th>
<th>Part No.</th>
<th>Price/Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divinycell PVC</td>
<td>3 Lb/Ft</td>
<td>1/4&quot;</td>
<td>32&quot; x 48&quot;</td>
<td>01-12300</td>
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</tr>
<tr>
<td>(Blue) Type H45</td>
<td></td>
<td>3/8&quot;</td>
<td>32&quot; x 48&quot;</td>
<td>01-12400</td>
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<td></td>
<td>5/8&quot;</td>
<td>24&quot; x 47&quot;</td>
<td>01-12500</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4&quot;</td>
<td>15&quot; x 26&quot;</td>
<td>01-12600</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>1-3/4&quot;</td>
<td>32&quot; x 48&quot;</td>
<td>01-12900</td>
<td></td>
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<tr>
<td>Eracer</td>
<td></td>
<td>2&quot;</td>
<td>48&quot; x 96&quot;</td>
<td>01-12920</td>
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<td></td>
<td></td>
<td>3&quot;</td>
<td>48&quot; x 96&quot;</td>
<td>01-12940</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>3&quot;</td>
<td>48&quot; x 48&quot;</td>
<td>01-12930</td>
<td></td>
</tr>
<tr>
<td>Divinycell PVC</td>
<td>6 Lb/Ft</td>
<td>1/4&quot;</td>
<td>37&quot; x 37.5&quot;</td>
<td>01-13000</td>
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</tr>
<tr>
<td>(Tan) Type H100</td>
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<td>1&quot;</td>
<td>6&quot; x 10&quot;</td>
<td>01-13100</td>
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<td></td>
<td>1&quot;</td>
<td>10&quot; x 12&quot;</td>
<td>01-13200</td>
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</tr>
<tr>
<td>Divinycell PVC</td>
<td>15.6 Lb/Ft</td>
<td>1/4&quot;</td>
<td>24.8&quot; x 27.75&quot;</td>
<td>01-13300</td>
<td></td>
</tr>
</tbody>
</table>

**LAST-A-FOAM –** Rigid, Polyether Polyurethane foam with fine closed-cell structure, light cream-yellow color. LAST-A-FOAM® is wonderfully versatile for sandwich-core applications. It cuts and shapes easily with common woodworking tools, and bonds to itself and other materials with most epoxy, polyester, or urethane-type adhesives. LAST-A-FOAM® is unaffected by water, fuels and most solvents, and paint finishes are easily applied. It is frequently used in regular molds after the gel-coat and first two layers of glass are installed; the LAST-A-FOAM® is added and another layer of glass applied for a strong, light-weight sandwich.

<table>
<thead>
<tr>
<th>Foam Type</th>
<th>Density</th>
<th>Thickness</th>
<th>Sheet Size</th>
<th>Part No.</th>
<th>Price/Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last-A-Foam Urethane/Polyester (Yellow) 275° F</td>
<td>4.5 Lb/Cu. Ft</td>
<td>10mm</td>
<td>24&quot; x 96&quot;</td>
<td>01-13400</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>1/4&quot;</td>
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<tr>
<td></td>
<td></td>
<td>1&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-14100</td>
<td></td>
</tr>
<tr>
<td>Last-A-Foam Urethane/Polyester (Yellow) 275° F</td>
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<td>1/4&quot;</td>
<td>24&quot; x 48&quot;</td>
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<td>1&quot;</td>
<td>24&quot; x 48&quot;</td>
<td>01-10104</td>
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<tr>
<td>Last-A-Foam Urethane/Polyester (Yellow) 275° F</td>
<td>8 Lb/Cu. Ft</td>
<td>0.200&quot;</td>
<td>12&quot; x 48&quot;</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>1/4&quot;</td>
<td>12&quot; x 48&quot;</td>
<td>01-14500</td>
<td></td>
</tr>
</tbody>
</table>
**COMPOUND MATERIALS PRACTICE KIT**

All designers highly recommend that builders who are considering a composite project purchase this practice kit. It contains the excellent 26 page 11" x 17" manual by Burt Rutan entitled MOLDLESS COMPOSITE SANDWICH HOMEBUIT/ AIRCRAFT CONSTRUCTION ($14.50) plus the assorted foams, epoxy, fiberglass, filler materials and supplies with which to work. Everything needed to practice the technique of composite building before venturing into a complete aircraft project.

Practice Kit with Manual ............................... P/N 01-15000
Practice Kit without Manual .......................... P/N 01-15100
International Practice Kit with Manual  ............. P/N 01-15050
Same as Practice Kit with the manual, but excludes the epoxy for International shipping.

**POLYCELL 100 POLYURETHANE FOAM**

New one-component polyurethane foam that requires no mixing. Dispenses like shaving cream from an aerosol can, then sets up to a rigid closed-cell foam. Adheres permanently to almost any surface - does not shrink, dry out or become brittle with age. 12 oz. aerosol can.

P/N 01-09200

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**Table: POLYFLEX COMPOSITE REPAIR KITS**

<table>
<thead>
<tr>
<th>Kit Size</th>
<th>Part No.</th>
<th>Approx. Foamed Vol. (Cu.Ft.)</th>
<th>Weight Lbs.</th>
<th>Price/Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Quart Kit (1 Pt. ea component)</td>
<td>01-08800</td>
<td>1-1/4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2 Quart Kit (1 Qt. ea component)</td>
<td>01-08900</td>
<td>2-1/2</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2 Gallon Kit (1 Gal. ea component)</td>
<td>01-09000</td>
<td>10</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>10 Gallon Kit (5 Gal ea component)</td>
<td>01-09100</td>
<td>50</td>
<td>110</td>
<td></td>
</tr>
</tbody>
</table>

**Polyflex** is a 3-part system that uses chemical reaction to heat the repair to 140°F, fusing it to the parent part. This system repairs ABS, PVC, CVPC, SMC, acrylic, vinyl, graphite, Kevlar, plexiglass, nylon, fiberglass, and many other materials. The system combines cyanoacrylate glue, a catalytic agent, and an accelerator. May be used on spacers, trimmings, eyelets, and to repair medium and miscellaneous void filling. Most small pleasure boats can be made "sink-proof" with approximately two gallons of "X-30". Data sheet available. "X-30" Foam contains a volatile fluorocarbon and should be stored at 70°F. or lower. "X-30" is used on the Osprey II bottom hull, canopy, nose cone, etc., requiring about four gallons of material (2 gallons of each), Shelf life at least 6 months. Users have reported "more than 2 years shelf life!"

**POLYFLEX REPAIR KITS - SEAT FOAM**

<table>
<thead>
<tr>
<th>Description</th>
<th>Size</th>
<th>Part No.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyflex Plastic Repair Kit</td>
<td>-</td>
<td>01-01045</td>
<td></td>
</tr>
<tr>
<td>Polyflex Plastic Repair Kit</td>
<td>Small</td>
<td>01-00325</td>
<td></td>
</tr>
<tr>
<td>Polyflex Plastic Repair Kit</td>
<td>Medium</td>
<td>01-00326</td>
<td></td>
</tr>
<tr>
<td>Polyflex Plastic Repair Kit</td>
<td>Large</td>
<td>01-00327</td>
<td></td>
</tr>
<tr>
<td>Non-Clog Cyanoacrylate Applicator reg. Tip</td>
<td>6” Long</td>
<td>01-01006</td>
<td></td>
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<tr>
<td>Non-Clog Cyanoacrylate Applicator Fine Tip</td>
<td>6” Long</td>
<td>01-01007</td>
<td></td>
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<tr>
<td>Polyflex Thin Cyanoacrylate</td>
<td>1/2 OZ</td>
<td>01-01009</td>
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<td>Polyflex Thin Cyanoacrylate</td>
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<td>01-01031</td>
<td></td>
</tr>
</tbody>
</table>

**CONFOR FOAM SEAT CUSHION**

Confor Form (formerly called Temperfoam) is the conforming foam cushion that was developed for the "Astronaut's Couch" back in the Apollo space program. Confor Form has the capability of absorbing a tremendous amount of impact shock compared to common polyfoam and it is flame resistant. It is an excellent product that will give your seats enduring comfort that you never thought possible. Adapts to you for pressure point-free comfort that is really incredible. The best universal cushion for aircraft use is a3 CF42/CF45/CF47 laminate. Confor Foam meets FAR 25.853, FAR 25.855, and CAL 117 burn specifications making it excellent for certified aircraft or homebuilts. Some special sizes in 1", 2", or 3" thicknesses are available on special request.

- 1" x 16" x 18" ................. P/N 01-09310 ................. ea.
- 2" x 16" x 18" ................. P/N 01-09320 ................. ea.
- 3" x 16" x 18" ................. P/N 01-09330 ................. ea.

**INFLATABLE LUMBAR SUPPORT**

This inflatable air pillow can be installed just under the seat material and will give you the customized support just where you need it. A convenient palm-size pump and a release valve control the firmness of the lumbar support. The In-Flight Back Support is made of a heavy duty self-extinguishing neoprene rubber, specially designed to pass FAR 25.853 flame-test requirements.

One inflatable lumbar support .......................... P/N 13-01501
Two Inflatable lumbar supports ......................... P/N 13-01821

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**LIQUID “X-30” FOAM**

(TWO-COMPONENT POLYURETHANE FOAM)

This system consists of two components - "X-30" Resin and "X-30" Catalyst. When the resin and catalyst are mixed in equal volumes they expand into a rigid closed-cell foam of 2 pound density. Thorough mixing of the two components is essential. "X-30" Foam expands approximately 40 times its liquid volume. Small-batch mixes are recommended. Cured foams can be easily trimmed, cut and shaped with common woodworking tools. Use toluene or MEK for cleanup. "X-30" Foam contains a volatile fluorocarbon and should be stored at 70°F. or lower. "X-30" is used on the Osprey II bottom hull, canopy, nose cone, etc., requiring about four gallons of material (2 gallons of each), Shelf life at least 6 months. Users have reported "more than 2 years shelf life!"

**BACKSAVER FOAM**

Backsaver foam is temperature sensitive, softening when it comes in contact with a warm surface; Thus, in a seat cushion, the foam softens and conforms to the person's body. This provides even pressure distribution and unconstricted blood circulation, significantly reducing discomfort, even over long periods. In addition, Backsaver foam has excellent energy absorption properties, which have made it excellent for use in the U. S. Space shuttle program and in military aircraft and helicopters. Pilots find that Backsaver cushions reduce their discomfort and fatigue, even on missions of 8 hours or more.

Aircraft Spruce now makes Backsaver foam available to the homebuilt and general aviation market.

17" x 18" sheet ........................................ P/N 01-09325 ................. ea.
48" x 72" sheet ........................................ P/N 01-09330 ................. ea.
VACUUM BAGGING SUPPLIES

VACUUM BAGGING FILM - #7400 film is a high grade nylon 6 film. It is transparent green in color and heat stabilized for long term, 350°F cures. Film is soft & pliable and ideal for high temperature composites, metal bond, and any function requiring heat & pressure. Width: 54”.

P/N 01-14803 ................................./ea.

4.5 OZ. BREATHER/BLEEDER PLY - #7039 is a light w/voven polyester breather system used for even volatile evacuation from vacuum bags. It can be used at pressures up to 85 psi (5.8 bars). Multi-directional conformability make it a very efficient breather. This breather does not contain any binders which could seal the air flow, Width: 60”.

P/N 01-14810 ........................../Lin.Yd.

STRETCH VACUUM BAG FILM 60” - Modified urethan film with incredibly high elongation, which allows anyone to vacuum bag easily. This film has memory and can be reused..0015 x 60” x 200 ft (38 x 1.52m x 62m) approx shipping weight 18lbs per roll (8.1 kg) Not affected by low humidity, always stays soft with no cracking. Elongation up to 600%, one with elastic memory. Use pressures up to 400°F (204°C). Can be heat seamed to custom shapes reducing labor costs. Fewer pleats necessary, conforming to autolave pressures

P/N 01-14800 ................................./ea.

10 OZ. BREATHER/BLEEDER PLY - #3100 is a 10 oz/sq. yd. nonwoven polyester breather system used for even volatile evacuation from vacuum bags. It can be used at pressures up to 200 PSI (13.8 bars). Multi-directional conformability makes it a very efficient breather. This breather does not contain any binders which could seal-off of air flow. Width: 60”

P/N 01-14815 ........................../Lin.Yd.

2 OZ. NYLON RELEASE PLY - #5201 SRB is a smooth nylon film which has been scoured and heat set so that it is contaminant free and will not shrink during the laminate cure cycle. It is then coated with a special release blend. The peel ply may be used for composite manufacturing, and metal bonding, but is not recommended for use with resin systems containing phenolic. Thickness: .005”. Color: Blue. Width: 60”

P/N 01-14820 ........................../Lin.Yd.

3 OZ. POLYESTER RELEASE PLY - #5252RB is a medium coarse weave polyester peel ply that leaves a surface with a rougher texture. It has been scoured and heat set to eliminate shrinkage during use and then coated with a special release blend. It can be used on all composite and metal bonding systems and is not affected by resin systems containing phenolic. #5252 provides protection of the laminate surface between primary & secondary processing. Thickness: .006”. Color: Brown. Width: 60”

P/N 01-14825 ........................../Lin.Yd.

RELEASE FILM - #2410 material is the most economical release film available that can be used at temperatures over 350°F. The film has handling qualities similar to the lowest priced halohydrocarbon film. Thickness: .002”. Color: Clear. Width: 54”

P/N 01-14830 ........................../Lin.Yd.

POROUS TEFOLON COATED RELEASE FILM - #7025 is used where a medium weight porous release fabric is required on the surface of a part. During the cure of the assembly it will allow excess resin and all of the air and volatiles to pass into the bleed/breather ply (CPM Airlow 70). At completion of the cure the fabric will release cleanly from the assembly. Color: Brown. Width: 37.5”. 10 yard min. order.

P/N 01-14833 ........................../Lin.Yd.

NON-POROUS TEFOLON COATED RELEASE FABRIC - #7039 is a lightweight extra smooth TFE coated glass fabric. It will leave little or no fabric imprint on most composite lay-ups. It is used as a release fabric where there is no requirement for bleeding or breathing resin or volatiles from the composite lay-up. It is mainly used for protecting caul sheets from resin contamination and as a release media on tool surfaces. Thickness: .003”. Color: Brown. Width: 37.5”.

P/N 01-14840 ........................../Lin.Yd.

FLASH TAPE - #6045-02 is a polyester backing film with a fully cured silicone adhesive. This tape is very tough and ideal for resin or adhesive flash removal. Color: White. Thickness: .002”. Roll size: 1” wide x 72 yds.

P/N 01-14845 ................................./roll

400°F RESISTANT SEALANT TAPE - #4401 is a grey vacuum bag sealant tape that removes cleanly from the tool surface at the completion of the cure cycle. It can be used at any temperature up to 400°F. It can be used on any tool surface now in use and has been a standard of the industry for many years. It has high initial tack and is very easy to apply to prevent leaks between the bag and tool. It works well for composite, metal bond, or any function that requires temperature and/or pressure up to 400°F. Color: Grey. Size: 1/8” x 1/2” x 25 ft

P/N 01-14850 ................................./roll

SEALANT TAPE ROLLER - #9050 is a plastic roller designed to assist in applying sealant tape between the bag and the tool. It assists the operator in applying maximum pressure to make a leak-proof, smooth seal. The unit is lightweight and easy to use, and the plastic roller helps prevent damage to the film. Roller width: 1-3/16”. Roller Diameter: 1-3/8”.

P/N 01-14875 ........................../ea.

VACUUM VALVE - TWO PIECE - #8112 is a two-piece vacuum valve which requires one quarter turn to lock in place. Service temperature to 500°F. This valve is an industry standard The base is anodized and is red in color. Inside Diameter: 1/4” standard. Threads: 1/4” NPT.

P/N 01-14855 ........................../ea.

OVEN VACUUM HOSE - #8020 is a 10 yards 60” x .001 thick walled, flexible silicone hose. It is normally used for debulking and oven cures using vacuum only. Furnished in standard 10 foot lengths. Other lengths available on special order. Hose size: 1/4” ID.

P/N 01-14860 ........................../roll

HIGH TEMPERATURE QUICK DISCONNECT SET - #8432 is a two-piece quick disconnect both male and female for use to 500°F at pressures up to 200 psi (13.8 bars). Sold as a set of male & female components.

P/N 01-14857 ........................../set

SHRINK TAPE - #9010 is an oriented polyester film designed to shrink as the laminate approaches cure temperature. The applied pressure is maintained during cure. It is used “as is” where the shape of the assembly makes conventional bagging too labor-intensive. If excess resin needs to be released during cure, perforating the shrink tape after the assembly has been wrapped with a porcupine roller will reduce the resin content as well as permit air and volatile escape. Thickness: .002”. Width: 1-1/4”, Roll length: 100 yds.

P/N 01-14870 ........................../roll

GREENFLOW 75 - Greenflow 75 is designed to efficiently distribute resin with little waste due to the low profile, tight construction. Greenflow 75 can be used with polyester vinyl ester and epoxy resins. Color: Green. Thickness: .035” .003 (.89mm±75μm). Melt Point (Method:DSC): 230°F (161°C). Configuration of Net: Rhombic.

P/N 01-01081 ........................../Lin. Yd.

PORCUPINE ROLLER - #9060 is a steel roller with a wood handle designed to perforate films to allow air, volatiles, and some resin to flow through the film. The amount of resin flow can be controlled by the depth of the pin penetration. Also useful on foam to give the bonding adhesive a better grip on the foam surface. P/N 01-14880

P/N 01-14891 ........................../ea.

VACUUM GAUGE - a dial faced vacuum gauge capable of displaying vacuum from 0” to 30” Hg. It is 2” in diameter and can be used on the vacuum pump line, holding tank, or with a vacuum valve to determine vacuum in specific areas of a bagged assembly. Fitting size: 1/4” NPT.

P/N 01-14885 ........................../ea.

VACUUM PUMP - Standard vacuum pump ideal for small shop vacuum bagging operations.

P/N 01-14891 ........................../ea.

VACUUM PUMP KIT - Includes vacuum pump, gauge, valve, fittings, and hose.

P/N 01-00164 .......................... 

VACUUM RELIEF VALVE -

P/N 52763 ..............................

BAGGING SUPPLIES STARTER KIT - Includes 10 yards of Vacuum Bagging Film #7400, 10 yards of 4.8oz. Breather Bleeder #3, 1 roll 400°F resistant Sealant Tape (25 yards/roll), 10 yards Dacron Fabric 1.8oz.x 60”, & 10 yards 60” x .001 Perforated Release Sheet.

P/N 12-11148 ........................../ea.

PERFORATED RELEASE SHEETS - 60” width .001 Perforated Release Sheet.

P/N 01-14894 ........................../ea.

ECONOMY VACUUM GENERATOR - a low cost and reliable method of generating a vacuum for those who already own an air compressor. The generator will create 27” of Hg pressure when coupled in-line to an air compressor capable of producing 2.2 cfm. Larger air compressors are advisable for continuous use applications. Suitable for parts up to 80 ft2. P/N 12-11145

P/N 01-14895 ........................../yd.

VACUUM FORMING MACHINE CONSTRUCTION PLANS - Finally, an affordable solution for builders that need vacuum forming capability. This 106 page illustrated assembly manual includes wiring diagrams, parts lists, parts sources, full size cut-away drawings of an assembled machine, 27 dimensioned assembly and parts drawings, and much more. All details of construction of the machine are covered and photos and diagrams will guide you through.

P/N 01-14896 ..........................
1000-A SUPER CLEAN PLASTIC CLEANER (19 FL. OZ.)

Before doing any sort of plastic repair, use Super Clean plastic cleaner to maximize the durability of your repair. Super Clean removes mold release agents, wax, grease, silicone, tar, bugs, sealers and other contaminants from painted or unpainted plastic or metal surfaces. It’s simple to use, just spray it on and wipe it off with a clean, lint-free cloth.

P/N 01-00533

2020-T SMC HARD-SET FILLER (2-5OZ. TUBES)

SMC Hard-set Filler is a 2-part epoxy system that is very rigid when fully cured. It works on ABS, SMC, fiberglass, polycarbonate and on any other repair application that requires a rigid, high impact resistant repair material. It has a working time of 3 to 4 minutes and is ready to sand in 15 minutes.

P/N 01-00534

2045W STAINLESS STEEL REINFORCING MESH (50 SQ.IN.-5”X10”)

Reinforcing Wire Mesh is designed to be used to reinforce any repair made with an airless plastic welder. We recommend that the mesh be used when a tear goes to the edge of the plastic. Since it is stainless steel, it is 5 times stronger than aluminum wire screen and is virtually impervious to oxidation under normal conditions. You can also use the mesh to fabricate tabs, fill holes and provide reinforcement in any meltable plastic.

P/N 01-00536

2100-1 SMALL INSTA-WELD KIT

Each Insta-Weld Kit comes with Insta-Weld 1, Insta-Weld 2, Activator, and Weld Compound. A complete set of instructions is included with each kit. This kit is designed to repair SMC, fiberglass, hard plastics, metals, rubber and other materials too numerous to mention. It does not work on polypropylene, polyethylene or TPO substrates. The small Insta-Weld Kit comes with a 1 oz. bottle of both the Insta-Weld 1, Insta-Weld 2 & 2 oz. bottle of Activator & weld compound.

P/N 01-00538

2200-1 INSTA-WELD 1 (THIN)

Insta-Weld 1 is our “thin” adhesive and is to be used when you have a clean break with no gap to fill. It has the consistency of water. To use, spray the broken area with 2303 Activator, clamp the parts together then apply a small amount of Insta-Weld 1. The adhesive will wick into the crack and create an instant repair. It does not work on polypropylene, polyethylene or TPO substrates.

P/N 01-00539

2250-1 INSTA-WELD 2 (THICK)

Insta-Weld 2 is our “thick” adhesive and is to be used when it is necessary to fill a gap. Insta-Weld 2 is about the consistency of 30 weight oil. To use, spray one side of the break with 2303 Activator, apply Insta-Weld 2 to the other side, then clamp together. It does not work on polypropylene, polyethylene, or TPO substrates.

P/N 01-00540

2303-3 INSTA-WELD ACTIVATOR (2FL. OZ./SPRAYER)

Our quick spray Activator causes instant curing of all Insta-Weld adhesives. Activator may be used before or after adhesive is applied. Come in plastic bottles and include sprayer.

P/N 01-00541

PLASTIFIX REPAIR KITS

Plastifix repairs virtually any rigid plastic and works exceptionally well on ABS. Repair cracks, fill gaps, reinforce repairs, rebuild broken tabs, fix stripped threads, and more. Plastifix’s most unique feature is the FlexMold molding bar which allows you to create a mold and cast missing pieces. No other plastic repair is more versatile. The 30 gram kits are enough to complete approximately 24+ of cracked plastic repair. The large kits will do about 24 feet. Kit includes: 253X Plastifix Powder 25G, 2520 Plastifix Liquid 50ML, 2542 Dropper Bottle Assembly, 2543 Power Application Cup, 2548 Transfer Pipette, 2550 Applicator Needle Qty: 2, 2500 Flexmold Molding Bar 10CC, 2501-Plastifix Repair Kit (30g, white) ......... P/N 01-00542

P/N 01-00543

2502-Plastifix Repair Kit (30g, clear) ......... P/N 01-00544

2502-Large Kit includes: 2531-L Plastifix Power 150G (WHITE), 2532-L Plastifix Power 150G (BLACK), 2520 Plastifix Liquid 250ML, 2542 Dropper Bottle Assembly Qty: 2, 2543 Power Application Cup Qty: 2, 2548 Large Transfer Pipette, 2550 Applicator Needle Qty: 4

P/N 01-00545

3800-4 FLEX-TEX FLEXIBLE TEXTURE MATERIAL (QUART)

Flex-Tex is a unique blend of materials designed to be used for re-texturing repaired areas on instrument panels, consoles, etc. A wide variety of pebble-grained textures can be achieved with this product by varying the air pressure, distance from work, and speed of pass. Apply with a regular spray gun or a PreVal sprayer. Dries flat black. Must be top-coated with color for durability and appearance.

P/N 01-00546

MICRO-WELD 100

Micro Weld 100 is a versatile and economical tool for repairing many types of plastics. Airless welding provides the do-it-yourselfer and professional alike a way to economically repair many of the items that would have otherwise been thrown away. Excellent for repair of plastic aircraft parts. FEATURES: • 100 Watt heating element with built in temperature control unit • 2045W Stainless Steel Reinforcing Mesh • 502HT Welding Tip • Welder Stand • Carry Case • Instruction Booklet • 15ft of 6 different welding rods

P/N 01-00766

BUMPER & CLADDING COAT (PINT)

Permanently recolor faded, scuffed, marred, and discolored plastics. Sticks to plastic without adhesion promoter or primer. Just clean the plastic with Super Clean Plastic Cleaner & spray the paint. No mixing required! Gives satiny, OEM look when dry.

Black (pint) .................. P/N 01-00548

3502-4 White (pint) ........ P/N 01-00561

3601-4 Light Gray (quart) .... P/N 01-00562

3602-4 Dark Gray (quart) .... P/N 01-00553

6481-2 2” ALUMINUM BODY TAPE

Can be used to hold broken parts together, create dams and simple molds when repairing plastic parts with Plastifix or when welding.

P/N 01-00549

CS100 CLEAN SHEETS

Clean Sheets are great to have around the shop. They allow you to keep your epoxy mixes clean and smooth while saving time by always having a clean surface to mix on. No more cutting cardboard to mix epoxy. 100 sheets per board.

P/N 01-00550

2043-UNI-CLOTH

FIBERGLASS CLOTH (9 SQ.FT.)

Uni-Cloth is a quality fiberglass cloth that is well suited for reinforceing plastic repairs as well as any other application requiring fiberglass reinforcement.

P/N 01-00553

Plastics Repair Instructional Book - P/N 01-00554

Plastics Repair Instructional DVD - P/N 01-00555
GLASS BUBBLES

These bubbles are actually hollow glass spheres. Because the high-quality glass is very crush resistant, the foam is much stronger, stiffer and water-resistant than any foam made by chemical foaming. These foams displace 4-8 times their weight in most resins and improve the handling characteristics of the base resin. They have a low bulk density and are nontoxic. Mix resin and hardener as directed, then fold in the glass bubbles. Upon cure, a strong, low-density product results which is easy to sand and file. May be shaped to form compound angles and curves. The term “micro” was applied to the mixture of microspheres and epoxy early in the development of composite structures. Although microspheres have been replaced by glass bubbles the word “micro” is still commonly used to reference the mixture. “Micro” is used to fill voids and low areas, to glue foam blocks together and as a bond between foams and glass cloth. Micro is used in three consistencies - (1) a “slurry” which is a one-to-one by volume mix of epoxy and glass bubbles, (2) “wet micro” which is about two to four parts glass bubbles by volume to one part epoxy, and (3) “dry micro” which is a mix of epoxy with enough glass bubbles to obtain a paste which will not sag or run (about five parts to one by volume). In all instances glass bubbles are added to completely mixed epoxy resin and hardener. Wet micro is used to join foam blocks and is much thicker than slurry (it has the consistency of honey) but can be brushed. Dry micro is used to fill low spots and voids and is mixed so that it is a dry paste and will not sag. Apply with a putty knife. Never use micro between glass layers.

CAUTION - When mixing epoxy and glass bubbles, wear a dust mask and keep your face away from the balloons that may float up into the air. Although glass balloons are inert, they can lodge in your eyes or in your lungs and cause problems. Handle with care.

DISPOSABLE ICING BAGS

These 12" disposable icing bags are ideal for applying beads of any size of micro epoxy or flox epoxy to all surfaces. Great for close-outs and are real time savers. Simply fill, cut end to desired bead size and squeeze. Never breaks down from epoxy. Sold in packs of 100 icing bags.

Pack of 100 bags........P/N 01-14710.

CAB-O-SIL

Cab-O-Sil is a fumed lightweight silica thickener used to reduce the flow of epoxies on vertical surfaces, as well as filling pinholes with its smooth texture.

1 gallon bag ........P/N 01-04711.

FLOCKED COTTON FIBER

A structural resin filler. The mixture of cotton fiber and epoxy is referred to as “flox”. The mixture is used in structural joints and in areas where a very hard, durable buildup is required. Flox is mixed in much the same way as dry micro but only about two parts flock to one part epoxy is required. Mix in just enough flock to make the mixture stand up. If “wet flox” is called out, mix it so it will sag or run. Flox is often used to reinforce a sharp corner. Paint a light coat of pure epoxy inside the corner, trowel flox in to make a triangular support. The flox corner is done just before one glass surface is applied for a wet bond to one surface.

1 Lb. Bag .............P/N 01-14800.

5 Lb. Bag ..............P/N 01-14900.

MILLED GLASS FIBERS

As the name implies, this material is made by milling fiberglass into a very thin consistency. This material is used in preparing a structural filler. This material is used in fillets that require structural integrity. Milled fiber fillers have higher strength than cotton flock but have fine particles of fiberglass that can penetrate the skin.

1 Lb. ..................P/N 01-14780.

PELOUZE PE 5 ELECTRONIC SCALE

Weighs up to 5 lbs. in grams or ounces. Ounces weighed in 1/10 oz. increments. Greatly increases accuracy of mixing resins. Allows the user to use different resin systems with varying mix ratios, yielding better physical properties of the cured resin.

P/N 12-01580.

BOND-IT-IT

An all purpose repair compound. It is excellent for rebuilding or fabricating parts and as an all purpose adhesive for wood, metals, ceramic, glass, and many plastics. It can be tapped or drilled, sanded, filed or painted. Patch holes and cracks and seals leaks. Sets rock hard overnight. Fix-It Metal is the same as standard Fix-It except it is loaded with aluminum metal to match the strength, weight, and use for each project. Fix-It is non-toxic, non-hazardous, and impervious to fuels and liquids.

Fix-It 1/4 Lb kit ............P/N 01-14770.

Fix-It 1 Lb kit .............P/N 01-14775.

Fix-It Metal 1/4 Lb kit ....P/N 01-14790.

Fix-It Metal 1 Lb kit ......P/N 01-14795.

3M™ #77 SPRAY ADHESIVE

This aerosol spray adhesive works well to laminate styrofoam sheets together. Laminations cut well with a hot wire. Net wt. 16.75 oz.


FOR OTHER 3M™ PRODUCTS SEE PAGES 345-352

PUTTY FLEX FILLER

Urethane Supply Company’s 1047 Putty Flex is a premium polyester finishing glaze that provides superior adhesion with excellent flexibility on plastics. Putty Flex produces excellent feather edge results on plastic, metal, SMC, fiberglass, cured primer and paint. Use to fill pinholes, dings, scrapes, sanding scratches and more! Putty Flex sands easily and resists clogging sandpaper.

P/N 01-00861.
**FILLERS – PRIMERS**

**SUPERFIL BY POLY-FIBER**

1 Quart Kit (20oz. Resin/12oz Hdnr) .......... P/N 09-28250
3 Gal Kit (2 gal.Resin/1 gal. Hdnr) .......... P/N 09-28260

**QUART GALLON**
........................
........................

**UV SMOOTH PRIME FILLER/PRIMER**
By Poly-Fi ber - A waterborne linear polyurethane formulated to fill pinholes, protect against ultraviolet rays, and prime composite surfaces prior to applying epoxy primer and Poly-Fiber Aero-Thane or any polyurethane top coat paint. Apply approximately 6 coats without sanding between coats. Recommend rolling on first 3 coats and either rolling or spraying final 3 coats. Dry sand when dry. 1 qt. w/16 ccCrosslinker P/N 09-28280
1 gal. w/64 ccCrosslinker P/N 09-28290

**FEATHER FILL**
A sprayable polyester filler/primer used for filling of minor surface irregularities such as scratches, blemishes and exposed fiberglass threads before final sanding and painting. It adheres to bare metal, plastic filler and fiberglass with minimal surface preparation. Cures ready to sand and paint in 45 - 60 minutes. Any type of finish - lacquer, enamel, acrylics - can be applied over Feather Fill with excellent adhesion. Quart kit includes catalyst and instructions. Approximately six quarts are required for finishing a Vari-Eze. DO NOT WET SAND.

#401 (1 Qt.) .......... P/N 01-00369
#391 (1 Gal.) .......... P/N 01-00370

**RUST DEFENDER SANDABLE FILLER**
Rust Defender is a one step finishing material from bare metal, body filler plastic, wood, aluminum, or fiberglass to a surface ready to accept any type of paint without concern about penetration of solvents or moisture. Provides fast build-up and fill, is non-shrinking, easy sanding, wet sandable and waterproof, and self-etching. Rust Defender can be sprayed or brushed on and can be built up like Bondo or Featherfill. can be wet be sanded and then is ready to sand in one hour, and it does not clog your sandpaper. Pot life and cure time are about one hour at 70 degrees Fahrenheit. Rust Defender is a versatile polyester filler which can save the homebuilder a lot of elbow work! Quart .......... P/N 01-00558
Gallon .......... P/N 01-00559

**HI BUILD POLYESTER SANDING PRIMERS**
- Quick Build Primer
- Quickly fills uneven surfaces, and major imperfections
- Easy sanding prep for surface primer, top coats
- Low VOC product
- Perfect Primer for prestec topcoats or any other surface coatings desired
- Fairly Hi-Build to 120mils

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**AEROPOXY LIGHT FILLER**
AEROPOXY Light is a two-component, lightweight epoxy patching and filler paste for foam, wood, and composite surfaces. It mixes easily, applies smoothly, bonds strongly and sands quickly to make the hard job of surface filling much easier.

**Color** | **AEROPOXY Light Reddish Tan** | **Test Method / Visual**
-----------|---------------------------|---------------------|
Mix Ratio  | 2 to 1 by weight / Volume | Calculated          |
Gel Time,  | 5-6 hrs. / To Shape      | ASTM D2471          |
@ 77°F    | 24 hrs. / Full Cure       | ASTM D792           |
Specific Gravity | 45 | ASTM D2240 |
Cured Hardness | 53 Shore D | ASTM D695 |
Compresive Strength | 2156 psi |          |

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<tr>
<th><strong>AEROPOXY LIGHT 1/2 LB KIT -</strong></th>
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<td><strong>AEROPOXY LIGHT 6 LB KIT -</strong></td>
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**HYSOL EPOXY PATCH KITS**
EPL0151 is a clear two part resin / hardener which is ideal for bonding fiberglass, PVC, and graphite. Cure time is 6-8 hours. EPK1C is a white 2-part resin / hardener epoxy system which is used to bond aluminum and ceramics.

**EPOXY SURFACE COAT**
AEROPOXY is a material from which all our pigments, resists chipping and cracking, and retains its high gloss. This surface coating can be brushed on as thick as 1/8" at a time without developing runs or sags. It is specially formulated to provide strong interlaminar bonds with the reinforcing materials, even if it is left unsupported overnight. #1099 readily accepts all our pigments, resists chipping and cracking, and retains its high gloss. Mix Ratio by Weight – 100:11.

**WEST SYSTEM 410 MICROLIGHT**
An excellent filler which provides easy workability for a variety of applications. Easy to sand and cures to a neutral tan color.

- 1.7 Oz. .......... P/N 01-08780
- 4.3 Oz. .......... P/N 01-08785

**LITE WEIGHT FILLER**
Lite Weight autobody filler is a very versatile filler which is excellent for holding jig blocks in place during composite construction. Applies evenly and allows sanding within minutes. Cures well even in humid climates. Creme hardener is included.

- Quart .......... P/N 01-00243
- Gallon .......... P/N 01-00244

**PRIME COAT PRIMER / FILLER**
Prime Coat ia a sandable, quick-drying aerosol primer which fills pin holes and scratches caused by sanding on fiberglass, wood, metals and many plastics. Prime Coat will prepare the surface of materials for the finish coat and provides an effective corrosion barrier as well. Prime Coat is zinc chromate yellow and can be used under lacquer, enamel, acrylic or epoxy finish coats. 11 oz. can.

P/N 01-00305
PEEL PLY – PRIMERS – PAINTS

PEEL PLY
A layer of 2.7 oz. Dacron fabric strips or tape laminated into a layup as if it were an extra ply of glass. The peel ply coats wets out with epoxy like glass cloth and cures along with the rest of the layup. However, the Dacron does not adhere structurally to the glass and when peeled away it leaves a surface ready for glass-to-glass bonding without sanding.

PEEL PLY TAPES
Requirements for Small Aircraft:
- 3 Rolls of 1” x 50 Yds. Tape
- 1 Roll of 3” x 50 Yds. Tape
- 1 Roll of 4” x 50 Yds. Tape

Quantity Discount: 10% on 12 Rolls; 15% on 25 Rolls (assorted).

DACRON FABRIC FOR HOMEBUILT AIRCRAFT
Easily controlled shrinkage by the application of heat by either a conventional steam iron or other heat source assures a professional covering job even on the first attempt. May be coated with aircraft dope, epoxies or other finishes as acceptable to the FAA. Dacron is available in many weights and weaves but three types have been selected as being most suitable as an aircraft covering material. The tensile strength of Grade A and Irish Linen aircraft fabrics is 80 lbs, which may be used as a comparable standard in selecting the proper Dacron fabric weight for a specific application. 1.8 oz. lightweight material which is generally used on gliders and over plywood. 2.7 oz. fabric is comparable in strength to Grade A. The finer weave assures an ultra-smooth texture-free finish. The 3.7 oz. material is a heavy duty fabric for extraordinary service. Sold by the yard. NOT for use on certified aircraft.

MOLD RELEASE AGENTS
POL-EASE ® 2380 MOLD RELEASE
Provides superior release with minimum buildup on mold surfaces for casting urethane elastomers, epoxy, polyester, and rubber compounds. Molded parts are easily cleaned for finishing operations. It is effective on aluminum, steel, epoxy, polyester, and elastomeric molds; it does not distort intricate patterns.

MAXIMUM MOLD RELEASE WAX
Meguiar’s® Mold Release Wax is a blend of imported waxes specially formulated to provide a maximum number of releases per application.

MOLD RELEASE WAX
High-temperature paste wax. 14 oz.

FIBERGLASS MOLD RELEASE
Plastiseal S12B, a film-forming, water soluble parting agent, assures clean release of fiberglass parts from molds. For application by brush or spray.

LPS MRX SILICONE MOLD RELEASE
Excellent for releasing molded parts in high temperature and extreme pressure environments. MRX Silicone Spray Mold Release provides maximum releases and superior value for the end-user. This non-staining, non-corrosive mold release is heat stable up to 500°F. It is a nonflammable product and contains no class I or II ozone depleting chemicals. Like all LPS MR-series mold releases, MRX Silicone Spray Mold Release doesn’t use Methylene Chloride.

HI GLOSS CLEAR POLYESTER TOP COAT
Features: * Super Clear - Glass like appearance Scratch Resistant * Buffs to a Super Hi-Gloss Finish * Refinishes to Original Hi-Gloss * Practically a Walk-A-Way Gloss Finish Product Applications: * Exotic wood coating * Gel coat additive for air cure applications * Musical instrument wood coating * Top coat over clear primers * Top coat over pigmented colors for clear depth * Automotive interior composite parts clear coating * Architectural wood finishes

Color Use Primer Part No. Price
White/White White 20-02 $99.75
Black/Black Black 20-06 $99.75
Apollo Gray 20-07 $99.75
Hamlet Black - 20-42 $99.75
Camile White White 20-54 $99.75
Lith Chrysalid Black 20-59 $99.75
Marble Stone 20-63 $99.75
Gray Stone Gray 20-64 $99.75
Onyx Black 20-77 $99.75
Silver Gray Gray 20-72 $99.75
Bright Blue - 20-77 $113.95
Dark Red 20-01 $113.95
Desert Camo Black 20-80 $99.75
Emerald Green 20-85 $113.95

ZOLATONE COCKPIT PAINT
Used to paint cockpit interiors, excellent on fiberglass. Gives a coarse, durable, professional finish. 1 gallon required for Long-EZ cockpit. Primer not required when used on fiberglass. Color chart available on request.

ZOLATONE PRIMER

Color Use Primer Part No. Price
Zolatone Epoxy Primer White Quart 01-00994 $31.95
Zolatone Epoxy Primer Gray Quart 01-00995 $31.95
Zolatone Epoxy Primer Black Quart 01-00996 $31.95
Zolatone Epoxy Primer Catalyst Quart 01-00997 $27.85

ZOLATONE POWER SPRAY KIT
Perfect for applying Zolatone on small objects or touching-up any Zolatone coating application, the Power Spray Kit is convenient and easy to use. Simply pour zolatone into the plastic Power Spray Jar using a funnel or small dip cup. Attach jar to Power Sprayer assembly with propellant can and you’re ready to go. The spray nozzle has been designed specifically for Zolatone coatings. The Power Spray Kit includes enough propellant to cover approximately 14 sq ft. (depending on distance from object, number of coats, and precise pattern desired.) Replacement cans of propellant are available so you can use the Power Spray Kit over & over.

DUPONT FILL ‘N SAND
Du Pont 210-S is a dark gray waterbased primer surfacer which provides an effective ultraviolet radiation barrier as well as an excellent finish-sanding surface in preparation for the finish paint. Any Du Pont top coats - acrylic lacquer, acrylic enamel or polyurethane (Imron) - will go well with 210-S. RAF recommends urethane paint over lacquer or enamel as it is tougher, more flexible and adheres best. It is also strongly recommended that one recognized paint manufacturers’ products be used throughout, from the primer through the top coat. Du Pont 210-S replaces 131S and 3011-S primers formerly recommended by RAF.

Color Use Primer Part No. Price
Du Pont Fill ’N Sand (Gallon) 01-00379 $31.95
Du Pont Fill ’N Sand (Quart) 01-00378 $99.75

Quantity Discount: 15% on 12 each, (assorted).
The tools offered in this section have been selected by professional aircraft designers and builders as being either necessary or highly desirable for working with composite structures.

**KUT-MASTER FOAM CUTTING FRAME**

These custom-built foam cutting frames can help produce professional results in foam cutting for the amateur builder. Constructed of 1-1/8" O.D. aluminum tubing, the heli-arc welded frame is lightweight yet extremely durable. The frames come completely pre-wired and ready to attach to the voltage controls shown below, and a tensioning system maintains uniform wire tension throughout the cutting process. The frames are stocked in 3 standard lengths, and custom frames are available on request (send sketch). Cutting depth is 11". Weight - 5 lbs.

- 2 Ft. Frame ........................................ P/N 01-15200
- 3 Ft. Frame ........................................ P/N 01-15300
- 4 Ft. Frame ........................................ P/N 01-15400

**HOMEBUILDERS SPECIAL HOTWIRE KIT**

An excellent new hotwire system consisting of a controller and transformer. Recommended by Rutan Aircraft Factory as a good system at a very economical price - P/N 01-15600

**SAFETY WIRE**

Type 302 stainless steel safety wire, for hot wire cutter. This is superior to nichrome wire, which is brittle and breaks easily. Specify .032" or .041" diameter wire.

- .032" Dia. Wire, 25 Ft. Coil........ P/N 01-15725
- .041" Dia. Wire, 25 Ft. Coil........ P/N 01-15825
- 1 Lb. Spool.............................. P/N 05-02687

**INCONEL 600 HOT WIRE**

Does not stretch. Excellent for hotwiring polystyrene foam.

- .032" Dia. Wire ............... P/N 01-15805
- .041" Dia. Wire ............... P/N 01-15810

**MUSIC WIRE**

Music wire is high carbon steel and although very high in tensile strength, must be capable of wrapping around itself without showing signs of cracking. 156 ft. of .049" dia. wire per lb., 46 ft. of .090" dia. wire, per lb. 22 Gal. .049" Dia. (1 lbs.)........... P/N 03-49500
- .080" Dia (32 Ga., 1 lbs.)...... P/N 03-49600

**TYPE 302 STAINLESS SPRING WIRE**

0.062" Dia................................. P/N 03-49610

**MICHAEL ENGINEERING EPOXY RATIO PUMPS**

This highly recommended pump, aptly called “Sticky-Stuff Dispenser”, will save about $50 in epoxy in building a VE type aircraft, plus time, mess, dermatitis, temper and risk of bad batches. Used by individual craftsmen and professionals alike, it is a practical engineering tool especially designed to eliminate the sticky, messy, costly hand proportioning of epoxy resins. It is well built and should last through the construction of dozens of aircraft. The Sticky-Stuff Dispenser assures accurate measurement of low-viscosity (under 3,500 centipoises) unfilled epoxy resin. The standard Model A dispenser pump delivers a ratio of 100 parts of resin to 44 parts of hardener.

- Adjustable Ratio Pump.......................... P/N 01-16010
- Rebuild Kit for 45:100 pump............... P/N 01-00054
- Small replacement container (ct)....... P/N 01-15920
- Large replacement container (gal)...... P/N 01-15910
- Stainless Steel Check Valve (Use with Jeffco epoxies)........ P/N 01-00258

**CALRAD VARIABLE VOLTAGE CONTROL**

A fine quality control to supply the electrical current for hot-wire cutting of styrofoam & PVC foam. One unit can serve to build many aircraft. Input 115VAC Output variable from 0-130VAC at Samps Caution - fuse should be inserted in the secondary to protect the control in the event of a short circuit.

Size: 6"h, 5"w, 6"d

- Input Cable: 6ft. heavy duty 3-prong
- Output Jack: 3 - prong AC jack
- Fuse Protected: 5A, 3AG: On/Off
- Rocker Type Power Switch

AC Voltmeter: 0-150 VAC

P/N 01-15500

**COMPOSITE TOOL KIT**

This kit includes an assortment of many of the commonly required tools used in composite construction.

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<td>GLR12C</td>
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<td>1</td>
<td>GLR26</td>
<td>2 x 6&quot; Plastic Grooved Roller</td>
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Kit - P/N 01-00166
**COMPOSITE TOOLS**

**DISPOSABLE RESPIRATOR REPLACEMENT PARTS**

- Dusts, Mists, & Fumes Pre-Filter: P/N 01-00382
- Fit/Check Filter Cover: P/N 7500-27

**GROOVED LAMINATING ROLLERS**

- These are the standard laminated rollers for wetting out woven roving and mat with polyester resin. Use with epoxy resin for applying tape into corners and for spreading thickened epoxy over large areas for gluing and fairing.

  1x3………P/N 01-01054
  1x6………P/N 01-00396
  1x9………P/N 01-00383
  2x3………P/N 01-00384
  2x6………P/N 01-00385
  2x9………P/N 01-00386
  1/4” Corner Roller………P/N 01-00397
  1/2” Corner Roller………P/N 01-00388
  1/2”x3” Detail Roller………P/N 01-00389
  3/4”x3” Detail Roller………P/N 01-00390
  3/4”x6” Detail Roller………P/N 01-00391

**EPOXY LAYUP ROLLERS**

- 3” wide roller with stipple adhesive cover. Has excellent stippling action for working out air bubbles in layups and has no tendency to lift the cloth. Use on all major layups.
- Order frame and cover separately.
- Roller Frame Only………P/N 01-24902
- Cover Only………P/N 01-24903

**PRECISE ACCU-KNIFE SET**

- Heavy duty cutting edges. Complete knife set. Over 40 blades to choose from.
- Specifications:
  - Blades are made of the highest-grade steel and are ground to razor sharpness for precision cutting.
  - Features include positive-holding blade lock • Nonslip handles. Complete with 8 different handles • 44 sharp blades • An aluminum-oxide, wet/dry sharpening stone • Packed in a hardy plastic cutting/storage case with magnets to keep the blades in place.
  - Fine precision cutting tools for the lab-highest quality knife set. Ultramicro to heavy-duty cutting edges are perfect for corks, paraffin, plant samples, and rubber tubing. Exceptionally sharp knives are ideal for delicate, close-tolerance, accurate cutting needs.
  - High-grade steel construction - Blades are made of the highest-grade steel and are ground to razor sharpness. Features include positive-holding blade lock, nonslip handles, and a perfect weight for balance.
  - Over 40 blades - Comes complete with 8 different handles, 44 sharp blades, and an aluminum-oxide, wet/dry sharpening stone. Set is packed in a handy plastic cutting-storage case with magnets to keep the blades in place.
- P/N 12-00381

**DISPENSER FOR MEKP CATALYST**

- Perfect to measure and pour catalyst. The bottle will hold 16 oz. of catalyst and dispenses liquid safely and accurately from 2.5 to 35 cc. Measurements are instantly repeatable.
- P/N 01-08503

**RESIN PUMP SYSTEM**

- Put an end to mess and worry, make mixing small resin batches a snap. Incrase accuracy of resin proportions and performance of resins. Each pump measures a liquid output of 30cc.
  - Pint pump………P/N 01-00957
  - Quart pump………P/N 01-00965
  - Gallon pump………P/N 01-00973

**STAINLESS STEEL INSTAREAD THERMOMETER**

- Stainless Steel Instant Read 1• Dial Thermometer
  - 0 Degree to 220 Degree F • Shatter-Proof Plastic Lends • Durable Stainless Steel • Plastic Case/Calibrating Tool
- P/N 01-00394

**POST CURE KIT**

- This kit consists of one post cure thermometer (P/N 01-00394) and 1 regulating thermostat (P/N 2E51) that allows control of electrical devices for heating.
- P/N 00393

**JIFFY MIXER**

- This is a very effective 2-1/2” diameter stainless steel mixer on a 15” shaft. Attach an air drill for fast, efficient mixing of larger batches. It will not dig into or gouge the sides or bottom of your mixing container.
- P/N 01-00395

**X-ACTO TOOLS**

- **NO. 5282 KNIFE SET**
  - Nos .1, 2 and 5 knives plus 14 assorted extra blades Handy, fitted chest.
  - P/N 01-17300

- **NO. 5083 KNIFE SET**
  - Nos .1, 2 and 6 knives plus 14 assorted extra blades in beautiful wooden chest.
  - P/N 01-17400

- **X-ACTO BLADE NO. 11**
  - P/N 01-16500

- **X-ACTO BLADE NO. 18**
  - X-Acto Blade #18. For deep wood chiseling. 1/2” surface. Package of 5
  - P/N 01-16600

*Other X-Acto items also available. Call for pricing.*
STANLEY TOOLS

STANLEY TAPE MEASURE
This 12 foot steel tape measure, with 1/2" blade, is graduated in tenths and hundredths of inches and also in fractions of inches (32nds). Very handy for all aircraft construction. A “must” for composite construction.
No. 33-272 P/N 33-272

STANLEY UTILITY KNIFE
Aluminum, die-cast in two sections - provides blade storage. Has handy hang hole. Furnished with No. 11-921 blade and blade guard.
No. 10-099 P/N 10-099

KNIFE BLADE
Heavy-duty pointed razor-type utility knife blade for No. 10-099 knife and most other makes of utility knives.
No. 11-921 (Pkg. of 5 Blades) P/N 11-921

HOOK BLADE
For use with No. 10-099 knife and most other makes of utility knives to cut linoleum, roofing material, cartons, etc., without damage. The razor-sharp hooked ends cut to full thickness in one stroke.
No. 11-961 Pkg. of 5 Blades P/N 11-961
Quantity Discount: 15% on any 10 Stanley items (assorted)

SPRING CLAMPS
Heavy-gauge steel clamps with vinyl grips and tips to prevent marring work. Jaws specially formed to hold flat or round objects. Two sizes available:
No. 3201-HT – Jaw Opening 1", Length 4" P/N 83-261
No. 3202-HT – Jaw Opening 2", Length 6" P/N 83-262

SINGLE-EDGE RAZOR BLADES
Used for trimming rough edges of laminates.
P/N 01-24904 Jea.
Box of 100 30% Discount.

DOVETAIL SAW
Cuts a true, smooth and narrow kerf. Comfortable hardwood handle provides positive grip. Professional quality.
No. 15-032 P/N 15-140

STRAIGHT EDGE
A 6-ft. long kiln-dried spruce board, 7/8" to 1" thick and 3" to 4" wide, used for checking the straightness of flying surfaces during composite construction.
P/N 01-25900

6" STEEL RULER
Flexible stainless steel rule graduated in 1/10ths and 1/100ths on one side and in quick-reading 32nds and 64ths on the other side.
6 inch P/N 616
12 inch P/N 12-02062

FELT TIP MARKERS
Used for marking locations on fiberglass throughout construction.
P/N 01-26000

12" LONG DRILL BITS
For use with standard electric drill for hard-to-reach jobs.
#10 (.1935" Dia.) P/N 12-05500
1/4" Dia. P/N 12-05600

COUNTERSINK
This assembly consists of a 1/2" dia. AT418E-4 100° cutter, a 1/4" dia. AT416, pilot and an AT409-1 adapter with 1/4" dia. shank for use with a hand drill. The adapter has a collet-like shaft to securely hold the replaceable pilot. Add pilot dash number to AT409. To complete part number see tool section for complete selection of pilots.
Complete Assemblies See Page 597

COUNTERBORE
A 5/8" diameter boring tool, with 1/4" diameter pilot. 10" threaded extension is used for boring holes in hard to reach places. Used in the installation of the landing gear on the LongEZ and Cozy aircraft. 3/4" bore does not have 1/4" pilot and must use the pilot received with the 5/8" boring tool.
5/8" diameter w/pilot P/N 12-00219
3/4" diameter without pilot P/N 12-00220

MINI GLUE TIP
Fits most Yorker top dispenser bottles. Just slip a Mini Glue Tip on spout and seal with a pin. Always ready for use-no fuss to fill, no mess to clean. Made of polypropylene - glues don’t stick. For shallow tip bends, heat in water, shape with fingers until cool.
P/N 01-27000 Pkg. of 4 Tips

RUBBER SEALANT
No. 732 RTV general-purpose, clear, one-part silicone rubber. Cures to a firm silicone rubber in 24 hours at room temperature.
4.7 Oz. Tube P/N 09-27800
COMPOSITE TOOLS

MISCELLANEOUS TOOLS AND SUPPLIES

**ALUMINUM ROTARY CUTTER FOR COMPOSITE WORK**
This all aluminum cutter however, will not "melt" when exposed to acetone, methylene chloride and other chemicals used to clean the cutters after use on wet layups. After use the aluminum rotary cutter is cleaned by simply leaving it in a can filled with acetone.

*Aluminum Rotary Cutter* 
P/N 09-24906

**90 DEGREE ALUMINUM ROTARY CUTTER FOR COMPOSITE WORK**
This cutter handle is all aluminum with special stainless hardware for easy assembly when changing out rotary cutter blade. Will not melt when exposed to acetone, methylene chloride, and other chemicals. Good for wet layups. To clean, just drop in small container of acetone.

*P/N 01-01047*

**PAINT BRUSHES**
Natural, undyed bristle brushes with smooth, unpainted wooden handles. Unaffected by paints, dopes, resins, thinners or solvents.

*1" Wide Brush* 
P/N 09-21200

*2" Wide Brush* 
P/N 09-21300

**RUBBER SQUEEGEE**
Developed especially for working with epoxies, this 6", or 36" wide hard rubber squeegee is superior to the plastic types. Can be easily cleaned & reused many times.

*6" Squeegee* 
P/N 01-24901

*36" Squeegee* 
P/N 01-00012

**NOTCHED SPREADER**
This plastic spreader is excellent for spreading epoxy at a steady rate to provide an even surface. Measures 4" x 4" and is notched on three sides in increments of 1/8", 3/16", 1/4".

*P/N 01-24909*

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**GRADUATED TAPER-TIP APPLICATOR**
This graduated 2 oz syringe is ideal for measuring and dispensing precise amounts of resins and other liquids.

*P/N 01-25635*

**DISPENSER BOTTLE**
Polyethylene bottle with Yorker (applicator) cap.

*4 Oz. Bottle* 
P/N 01-24905

*16 Oz. (1 Pint) Bottle* 
P/N 01-24906

*Less 15% for 12 or more*

**INDUSTRIAL SYRINGE**
Made of hi-impact polyethylene with seamless body and special safety-grip plunger. Capacity 10 cc. Tapered dispensing nozzle can be clipped with scissors at proper diameter to govern output. Excellent epoxy can be clipped with scissors at proper diameter.

*P/N 01-25000*

**MIL GAUGES**
These color-coded mil gauges are solid anodized aluminum for long life and come in four sizes for a variety of FRP applications. Machined to close tolerances (0.0001") for accuracy and available in mils (inches) and microns (metric).

*3-18 mils* 
P/N 01-00411

*10-35 mils* 
P/N 01-00412

*40-65 mils* 
P/N 01-00413

*400-650 microns* 
P/N 01-00410

**MULTI-MEASURE PLASTIC CONTAINERS**
Use again and again for liquid ingredient accuracy. A must-have item when mixing resins. Seal the liquid in the container with the matching sized plastic lid.

*1 Qt. mix cup* 
P/N 01-00915

*1 Qt. lid* 
P/N 01-00926

*2.5 Qt. mix cup* 
P/N 01-00330

*2.5 Qt. lid* 
P/N 01-00331

**EPOXY MIXING CUPS**
Unwaxed, flat bottom paper cups in three convenient sizes for small mixes.

*3 Oz* 
P/N 01-25600

*8 Oz* 
P/N 01-00416

*12 Oz* 
P/N 01-25700

*16 Oz* 
P/N 01-00324

**MIXING STICKS**
These mixing sticks are medical tongue depressors which work well for mixing small batches of epoxy. Size: 3/4" x 6". Box of 500.

*P/N 01-25800*

**TAPERED OFFSET SPATULA**
This tapered spatula is stainless steel with wood handle. Ideal for making 3/8" radii on bulkheads, ribs, or anywhere a uniform radius is required.

*P/N 01-24915*
COMPOSITE TOOLS

DREMEL TOOLS

**DREMEL MOTO-TOOL**
A versatile, precision power tool with many uses in the construction of composite aircraft. Ideal for wood, plastics and metals. Sturdy, shatter-proof nylon housing.

**MODEL 100 MOTOTOOL**
- Constant Speed: 35,000 RPM. Lubricated bronze sleeve bearings. Amps: 0.8
- P/N 01-18600

**NO. 428 WIRE BRUSH**
- VE builder reports it works beautifully for cleaning the residual foam and micro off of the canard, wing and winglet trailing edge overlaps in preparation for the top skin layups. Do not run in excess of 15,000 RPM
- P/N 01-22100

**REPLACEMENT MOTOR BRUSHES**
- (Specify Motor Tool Model No.)
- P/N 01-18701 per pair

**COMPOSITE TOOLS**

**DREMEL KIT 2850D**
- Single Speed Multipro Kit
- P/N 01-18800

**DREMEL KIT 2850**
- Two Speed Multipro Kit
  - Ideal for multiple applications on a variety of materials. Contains Two Speed MultiPro Tool, Quick Change Collet Nut, Customized Storage Case, Wrench, 30 assorted Accessories and 175+ uses book.
- P/N 01-38000

**DREMEL KIT 3956**
- Variable Speed Multipro Super Kit
- P/N 01-00130

**MULTIPOWER CHUCK**
The Dremel MultiPro chuck allows you to quickly and easily change accessories on your Dremel MultiPro rotary tools without changing collets. Will accept accessories with 1/32” - 1/8” shanks. Use only with corded MultiPro tool models 275, 285, 395, 595.
- P/N 01-00131

**NO. 402 MANDREL**
- For use with all cutting wheels, sanding discs and polishing wheels. 1/8” shank.
- P/N 01-22000

**NO. 428 WIRE BRUSH**
- VE builder reports it works beautifully for cleaning the residual foam and micro off of the canard, wing and winglet trailing edge overlaps in preparation for the top skin layups. Do not run in excess of 15,000 RPM
- P/N 01-22100

**REPLACEMENT MOTOR BRUSHES**
- (Specify Motor Tool Model No.)
- P/N 01-18701 per pair
COMPOSITE TOOLS

COMPOSITE TOOLS

ALUMINUM OXIDE GRINDING STONES
Use on metals, castings, welded joints, rivets and rust. Ideal for sharpening, deburring and general purpose grinding of most materials.

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<th>Cutter</th>
<th>Part No.</th>
<th>Price</th>
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DREMEL TOOLS

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STRUCTURED TOOTH TUNGSTEN CARBIDE CUTTERS
Fast cutting sharp teeth for greater material removal. Use on fiberglass, wood, plastic, epoxy, rubber, laminates, particle board, soft metals, ceramic tile.

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100 114 115 116 117 118 121 124 125 131 134 144 190 192 193 194 196 198 199

HIGH SPEED CUTTERS
High Speed Cutters can be used for shaping, hollowing, groving, slotting, making tapered holes in soft metals, plastics and woods. Number 198 and 199 cutters can be used to make small slits.

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<td>#197</td>
<td>01-21000</td>
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</table>

NO. 407 1/2” DRUM SANDER - Ideal for rough shaping of wood and smoothing of fiberglass. Sander bands are replaceable. Furnished w/ one band. 1/8” shank
P/N 01-19000

NO. 408 DRUM SANDER BANDS - 1/2” Diameter, Coarse grit. Two packages of 6 are required for the VE.
P/N 01-19100

DREMEL 543 CUTTING / SHAPING WHEEL - For cutting and shaping on soft and hard woods, fiberglass, plastics and laminates (not metal.) This versatile wheel is coated with tungsten carbide grit for long life. It is coated on both sides, so it cuts and finishes in one operation.
P/N 01-01056

HIGH SPEED CUTTERS
High Speed Cutters can be used for shaping, hollowing, groving, slotting, making tapered holes in soft metals, plastics and woods. Number 198 and 199 cutters can be used to make small slits.
SANDING TOOLS

SANDING STICK

Our Sanding Stick is ideal for aircraft builders, hobbyists, machinists, or anyone who needs to finish those hard to reach surfaces. It is made of high impact chemical resistant material and its unique design allows the user to rotate the abrasive belt 360° for its complete use. Sanding Stick is excellent for polishing, deburring, or sanding wood, metal, ceramics, and electronics, and can be used dry or with water, acetone, kerosene, or oil. Order different colored holders for easy grit identification. Order holders and belts separately.

Sanders: Complete the Holder part number by adding correct numbers for the holder color desired. Complete with 10 (gray), 20 (red), 30 (blue), 40 (green), 50 (yellow), or 60 (black). Example: 01-41140 is a green holder in 1/2" x 8" size.

Belt: Complete the Belt part number by adding the correct numbers for the belt grit desired. Complete with 080 (80 grit), 120 (120 grit), 240 (240 grit), 320 (320 grit), 400 (400 grit), or 600 (600 grit). Example: 01-45400 is a 1/2" x 8" belt in 400 grit.

SANDING BLOCK

A hard rubber tool which comfortably fits the hand for scratch- to finish-sanding. Used by professionals for years in all sanding operations. Simply cut a piece of sandpaper 2-3/4" x 9" and insert each end into the sanding block. Paper is held securely by nail retainers. Makes the sanding operation much easier.

Model No. 100…………………P/N 01-26400…………………

SANDPAPER

The weights and grits listed have been found to be the most effective for sanding fiberglass/epoxy surfaces. Sheet size .9" x 11".

<table>
<thead>
<tr>
<th>Sandpaper Type</th>
<th>Part No.</th>
<th>Price /Sheet</th>
<th>Less than 50 Sheets</th>
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<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>Open Coat &quot;D&quot; Weight</td>
<td>01-25200</td>
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<tr>
<td>Silicon Carbide</td>
<td>36 Grit</td>
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<tr>
<td>100 Grit</td>
<td>&quot;C&quot; Weight</td>
<td>01-37700</td>
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<td>220 Grit</td>
<td>&quot;A&quot; Weight</td>
<td>09-20600</td>
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<tr>
<td>320 Grit</td>
<td>&quot;A&quot; Weight</td>
<td>09-20800</td>
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</tbody>
</table>

SANDPAPER 3MM™

Wet or dry Tri-M-ite (3M) is a silicon carbide abrasive paper made especially for producing satin-smooth finishes on metal and other doped, lacquered or enameled surfaces. Wet or dry performs best when used with water or oil, but can also be used dry. Sheet size .9" x 11". Available in 220-A, 280-A, 320-A or 400-A grit.

(Typically a paper has an especially light, flexible backing). For other 3M™ products see pages 345-352.

CURVED TOOTH FILE

Milled files designed for smooth, fast work on annealed steels, hard plastics and composite materials. 1/4" length. 1-1/32x5/16 sections, 8 teeth per inch. P/N 01-00392.

PREPPIN’ WEAPON SANDING BLOCK

Preppin’ Weapon is a handy sanding block made of Styrofoam core and high impact ABS that won’t break when dropped. Easy to grip for wet or dry sanding. Contoured to fit the shape of a hand and is sized to fit a 1/4" sheet of plain backed 8 x 11 sandpaper or a 2 3/4" wide file paper. It’s coil spring design holds single or multiple sheets equally tight and saves reloading time by stacking up to 4 sheets and tearing them away as the abrasive wears out. Save reloading time by using colored indicators. Excellent for builders of aircraft, boats, cars, etc.

Yellow………………P/N 12-00505………………
Red………………P/N 12-00506………………
Green………………P/N 12-00507………………

MINI-SANDER

A unique sanding tool which uses a 1-1/2" wide strip of sandpaper formed to make a belt. Locked taut by a patented mechanism that snaps into place with a finger pull. Its knife edge sides and padded body sand close to right angle fittings & fit into small concave recesses. Sander body is 7/8" x 4" and made of high impact plastic. Buy ready-made belts or make your own (6 belts from standard sheet).

Mini-Sander………………P/N 01-26800………………
Wet or dry Mini-Strips, 3 - #500, 3 - #320, 3 - #220
Pkg. of 9 Strips………………P/N 01-26800………………
New Continuous Belts (load free) Aluminum Oxide #120
Package of 3………………P/N 01-26910………………
New Continuous Belts (load free) Aluminum Oxide #220
Package of 3………………P/N 01-26915………………

PERMA-GRT CONTOUR SANDING BLOCKS

These user friendly sanding blocks are made from extruded, anodized aluminum. The 32mm (1.25") Radius Curve is covered on the external and internal radius with Tungsten Carbide abrasive sheets. The Contour Blocks come in either the Coarse (60US grit approx.) or Fine (120US grit approx.) Small block is 5.5" long and large block is 11" long.

Benefits:
- Shape and sand curves, grooves, etc. quickly and easily
- Great for fillets, leading edges, under cambers, etc.
- Extremely tough, will not wear out like normal sandpaper
- Will last for years without having to change the sheets
- Does not clog easily (brush or knock out)
- Easy to remove glues, resins, paint, epoxy etc. w/ paint remover
140MM Contour Block (COARSE)………………P/N 01-00591………………
140MM Contour Block (FINE)………………P/N 01-00592………………
280MM Contour Block (COARSE)………………P/N 01-00593………………
280MM Contour Block (FINE)………………P/N 01-00594………………

TEE BAR ALUMINUM SANDING BLOCKS

These Tee Bar sanding blocks provide a large, straight, and flat sanding surface which won’t wear out. Easy to hold, can be used over and over and are permanently anodized. These blocks can help provide straighter and truer surfaces. The self-adhesive sanding strips can be cut to any length, are clean and neat, do not need glue and do not peel. Furnished in handy 3" wide x 5 yard rolls and available in various grits:

11" Aluminum Tee Bar………………P/N 01-25006………………
22" Aluminum Tee Bar………………P/N 01-25007………………
Silicon Carbide Superfine Sanding Strip………………P/N 01-25001………………
Silicone Carbide Fine Sanding Strip………………P/N 01-25002………………
PERMA-GRIT HAND TOOLS

Hand Tools

Perma-Grit Tools are made of Tungsten Carbide Grit, one of the hardest elements available, second only to diamonds. They are specifically designed and developed for aircraft builders, woodworkers, and modelers. These tools will cut, sand and shape tough composite materials, saving homebuilders hours of building time. Ideal for fuselage shaping and wing building, these tools are highly recommended by several kitplane manufacturers. Available in coarse (180) & fine (320) grit.

Rotary Files

Supplied with a 3mm integral arbor so they may be used in reversible drive drills and hobby drills. These files are well balanced and run smoothly, and cut a wide range of materials with little need for secondary finishing. Available in coarse and fine grit.

Rotary Cutting Discs

These durable cutting discs are available in two sizes (19mm and 32mm) and come complete with a 3mm steel arbor to fit hobby drills. Will cut all woods, plywood, wire, composites, ceramics, stone, etc.

Sanding Blocks & Flexi-Strips

These versatile sanding blocks are ideal for sanding large areas, creating straight edges, producing dihedral angles, profiling leading edges, feathering trailing edges, and more. The sanding blocks are coarse grit on one side and fine grit on the opposing side. The flexible grit strips can be cut and shaped to any form, external or internal.

3/8” Inch Needle File Kit with Handle

Set of 5 files: Hand, Round, Halfround, Square and 3-Square. Extremely versatile tools, popular for detailed work. These files cut in any direction and do not clog easily. Cuts quickly leaving an excellent finish.

Needle Files

These extremely versatile tools are excellent for shaping and finishing. They will cut in any direction and do not clog easily. Our needle files cut quickly and leave an excellent finish. Very popular for detail work. Furnished in Medium 280 grit. Riffler Files: Large Needle Files

File Handle Needle Files

Model No. Part No. Description Price
NF1H 12-00081 Set of 5 needle files w/ Handle .
NF2 12-00082 Set of 5 needle files w/o Handle .
NF-F 12-00083 Flat needle file .
NF-K 12-00084 Knife needle file only .
NF-R 12-00085 Round needle file only .
NF-S 12-00086 Square needle file only .
NF-T 12-00087 Triangle needle file only .
RIF-1 12-00088 Set of 5 Riffler files w/ Handle .
RIF-F 12-00090 Flat Riffler file only .
RIF-H 12-00091 Half-round Riffler file only .
RIF-R 12-00092 Round Riffler file only .
RIF-S 12-00093 Square Riffler file only .
RIF-T 12-00094 Triangle Riffler file only .

Lounge Needle File Handle

Comfortable plastic handle with brass collet to accept all large (180mm) needle files. Overall length 115mm. Collect 5mm

PN 12-01927........................

PN 12-01752...........................
INVISIBLE GLOVES #1211

Invisible Gloves #1211 are a soft paste-like substance that when applied to hands provide protection against caustic and carcinogenic chemical products including hydraulic fluid, paints, ink, MEK, zink chromate, jet fuel, graphite, engine exhaust by-products, adhesives and much more. Invisible Gloves meets military and industrial safety standards and can protect any area of the body (hands, arms, face, legs, etc.) exposed to hazardous products. Especially useful in working with materials used in composite aircraft construction. One pint yields 100 pairs of gloves. Invisible Gloves #1211 are easily removed with water. Allows complete freedom of hand and finger movement. Hands will not heat up and tools will not slip.

GLOVES IN A BOTTLE

Protect your hands with a protective skin lotion called Gloves in a Bottle. Perfect for homebuilders, particularly those who work with composite aircraft, it binds with skin, forming an invisible pair of gloves to help protect against machinery and chemicals. It also protects against cracking and drying due to weather. Conventional lotions try to replace natural moisture with artificial moisture, but they don’t really work because every time you wash or touch something they come off.

Conventional lotions only attempt to replace natural moisture with artificial moisture, but they don’t really work because every time you wash or touch something. Gloves in a bottle keeps moisture-free, hypoallergenic, non-greasy, non-sticky. Turns the outer layer of skin and moisture and helps retain skin’s own natural oil and moisture. Used and recommended by professional painters and are easily removed with water. Allows complete freedom of hand and finger movement. Hands will not heat up and tools will not slip.

SERIES 8 WASH-OFF HAND PROTECTION

SERIES 8 • A less expensive “clone” of the famous PRRM hand creme developed in Europe, Series 8 is highly recommended by Rutan Aircraft Factory for working with epoxies. It protects hands from most epoxies, grease, oil paint, paste, gasoline, tar, lacquer, acetone, styrene, fiberglass and many more substances. It helps prevent chapping, cracking and drying of hands, and is an excellent aid to persons with sensitive skin. No soap is needed for cleanup - hands wash clean with water alone.

PLY NO. 9 PROTECTIVE HAND GEL

Provides a thin, invisible, flexible film which is an excellent barrier to epoxy resins, rubber adhesives, vinyl plasticizers, polyester resins and glass fibers. Epoxy and gel wash off easily in soap and water.

DENATURED ALCOHOL

Can be mixed with soap and water. Is harmless to rubber. Use as a solvent for thinning, removing and cleaning epoxy, brushes, and equipment.

REPLACETONE

Cleans polyester and epoxy resins from tools and hands without the hazards associated with chemical cleaning solvents. It is a non-volatile, non-flammable, and a biodegradable replacement for acetone and MEK solvents. Replacetone separates resins to the bottom of the cleaning container, but it does not dissolve them. Pour off non-emulsified Replacetone and use again.

LATEX GLOVES

Disposable but reusable gloves which resist tearing. Large size. Fits right or left hand. Box of 100.

COTTON GLOVES

Lightweight liners - wear under latex gloves. More comfort, improved sensitivity.

BUTYL GLOVES

These gloves are resistant to the permeation of epoxy resins and curing agents and have been found to offer by far the best protection of any glove available.

MAXSHIELD DISPOSABLE PROTECTIVE CLOTHING

FULL BODY COVERAGE: RECYCLED TYVEK® • Jump-suit with Hood Covers. It’s the ultimate protection in a Tyvek® jumpsuit, covering you from head to toe with an integrated hood and elastic-topped shoe covers. If you work in an environment where it’s important to keep a barrier between you and microscopic particles, this is the Tyvek® jumpsuit for you.

PLY NO. 9 DISPOSABLE SHOE COVERS • High top boot covers w/elastic top.

TYVEK® DISPOSABLE • Shoe Covers, Boot Covers With a Tyvek® disposable shoe covers you don’t have to compromise. That’s because Tyvek® disposable shoe covers deliver the best balance of protection, durability and comfort.

THE TYVEK® SUIT • The Lowest-Priced Recycled Coverall. You work with messy stuff... dirt, paint, solvents, chemicals, oil, grease. Protect your skin and clothing with an affordable barrier garment – the Tyvek® suit. These multipurpose suits are so durable you can wear them over and over. But they’re priced so low, you can afford to throw them away when it’s time.

RECYCLED TYVEK® APRONS • The Better-Than-Plastic Apron. A regular throw-away plastic apron might be good enough for small jobs. But for complete protection from food splashes, hot oil, dangerous chemicals, and other big messes, the serious professional chooses a Tyvek® apron. Features: - Bib style for full protection. - 28” x 36” in size. - Serged seams for strength. - Long ties to customize the fit.

THE LOWEST-PRICED RECYCLED COVERALL 100% Tyvek® - The lowest-priced recycled coverall. A regular throw-away plastic apron might be good enough for small jobs. But for complete protection from food splashes, hot oil, dangerous chemicals, and other big messes, the serious professional chooses a Tyvek® apron. Features: • Bib style for full protection. • 28” x 36” in size. • Serged seams for strength. • Long ties to customize the fit.