

# USING CYANOACRYLATE ADHESIVES

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Editor

*(PFFT Editor's comment: Although this sounds a bit like a quasi-advertisement, it's a good article to stash away as a reference document when you've got a problem to solve.)*

Cyanoacrylates (CAs) have become the adhesive of choice for most hobby and household applications. High quality CAs such as INSTA-CURE™, when used properly, form bonds that in many cases are stronger than the material that is being adhered. INSTA-CURE™ is a highly refined CA which, combined with its freshness, gives a guaranteed 2 year shelf life.

CAs are reactive monomers that chemically link (polymerize) when pressed into a thin-film. The very thin layer of water moisture present on most surfaces acts as an alkali, or weak base, which is the catalyst that results in bonding; however, the presence of detectable amounts of water usually degrades the performance of CAs.

INST A-CURE has a water-thin viscosity that wicks deep into joints by capillary action and cures in a matter of a few seconds. Surfaces to be bonded must be tight fitting and should be held together while you apply the CA around the edges of the seam. At the moment CAs cure, they give off a vapor that can irritate the nose and eyes, so be prepared. Thin CAs work very well on balsa since they penetrate into the wood and form more than just a surface bond.

INSTA-CURE+™ is a higher viscosity CA for loose fitting joints in which the adhesive must bridge gaps. Normally, the thicker CA is applied to one surface and then the parts are held tightly together for about 5 to 15 seconds. For large surface areas, including those with close fitting joints such as laminations, INSTA-CURE+ should also be used. To prevent premature curing, don't spread the glue into a thin film. Lay down a serpentine bead with about 1" separations on one surface, then assemble the parts, letting the pressure spread the CA out.

INSTA-SET™ is a catalyst which acts as an accelerator that allows CAs to quickly cure in thick layers by enhancing the alkaline conditions during polymerization. INSTA-SET in a spray bottle is normally used to cure the CA that flows from joints when parts are pressed together. Applying an additional bead of thick CA along a seam and then curing it with INSTA-SET significantly enhances a joint's strength. For difficult to bond materials, INSTA-SET can be applied to one surface and CA to the opposite surface. When brought together, they will bond instantly. INSTA-SET is formulated with a strawberry scent and activates CA in 6 to 8 seconds with little degrading of the CAs strength, which is a problem with many other accelerators. INSTA-SET is 100% foam safe and can be used on clear plastic.

MAXICURE™ extra thick 10-25 second CA is the best CA for most plastics, including GE's Lexan™. MAXICURE is the best

choice for plastic model assembly. When used with INSTA-SET it will fill most voids. It can be carved with a knife or razor blade and sanded to form a finish indistinguishable from plastic. Its extra thickness makes MAXICURE easier to work with for most applications. MAXICURE bonds hardwood and plywood better than any other hobby adhesive. For gluing to the inside cloth textured surface of fiberglass, scrape the area to be bonded with a razor blade or coarse sandpaper before using MAXCURE or any other adhesive. Plywood should be lightly sanded before bonding.

SUPER-GOLD™ and SUPER-GOLD+™ are our odorless INSTA-CURE CAs. They are non-frosting and take only 2 or 3 seconds longer to bond. There are no fumes that irritate the nose and eyes. The SUPER-GOLDS are 100% foam safe; therefore, they can be used in the building of foam core wings and the assembly and repair of plastic and foam ARF's. They will not fog clear plastic. SUPERGOLD+ is ideal for attaching clear canopies in plastic model kits; however, MAXICURE is still recommended for assembling the rest of plastic kits. Wood can be bonded to white foam with SUPER-GOLD+ in less than fifteen seconds. For bonding foam to foam, spray a very light fog of INSTA-SET to one piece and apply SUPER-GOLD+ to the other before joining. Excess INSTA-SET may create too much heat, which can melt the foam. Both SUPER-GOLDS cure to a more flexible consistency for better shock absorption. Whenever a large amount of CA is to be used in such applications as saturating fiberglass or Kevlar, SUPERGOLD eliminates the irritating fumes from the evaporating monomer that make repeated use of CA unpleasant at times.

IC2000™ is a rubber-toughened cyanoacrylate that forms superior shock resistant bonds on non-porous surfaces. The black colored CA has added flexibility for the bonding of metals, fiberglass, rubber, carbon-fiber and other advanced materials. For model use, IC2000 is ideal for the bonding of bulkheads, formers and servo rails to the inside of fiberglass hulls and fuselages. Set-up time is 20-40 seconds, which can be accelerated with INSTA-SET. When cured, IC2000 is pliable enough to be carved with a hobby knife. IC2000 is the best adhesive for R/C car tires.

UNCURE™ debonder will soften cured CA. If parts are bonded incorrectly or your fingers are stuck together, a few drops of UNCURE will dissolve the CA in about a minute. Apply on bonded skin and roll apart fingers. Once unstuck, use acetone to clean off softened CA, then wash off with soap and water. UNCURE will easily remove the adhesive residue from price tags or tape, but care must be taken since it will also remove the paint from many surfaces; however, this also means it is an extremely good solvent to clean paint brushes.

IC-GEL™ is a cyanoacrylate paste that is extremely thick which comes in an applicator tube like toothpaste. It has the same bonding and curing time characteristics as MAXI-CURE, IC-Gel, however, can be applied to a vertical surface and will stay in place. It will not run. This can be very convenient for some assembly applications. Applying CA to the bottom of a horizontal surface, such as a ceiling, can be very difficult with anything other than a full standard CA bottle. IC-GEL can be applied at any angle with just a squeeze of the tube. The gel does, however, have a tendency to continue to come out of the

tube for about a second after pressure is released, so this must be taken into account to apply the exact amount of IC-GEL that you want.

IC-GEL™ is an excellent putty for plastic models. It will fill any void and can be formed to many shapes. Applying INSTA-SET allows IC-GEL to be sanded or filed to final shape in less than 20 seconds. Autobody repairmen have finished their jobs in a fraction of the time by using IC-GEL with the additional advantage over normal body putties of superior bonding to metal surfaces. IC-GEL, along with MAXI-CURE, is also used for the underwater bonding of coral frags to rock.

INSTA-FLEX flexible thin CA is ideal for many applications, including the installation of CA hinges. When cured, INSTA-FLEX does not turn brittle and remains clear, even if accelerated with INSTA-SET. It has superior shock resistance. Although not as thin in consistency as INSTA-CURE, INSTA-FLEX still has good penetrating qualities and its application can be easier to control. For CA hinges, we recommend drilling a 1/16" hole in the center of the hinge slots to insure the complete saturation of the hinge when INSTA-FLEX is applied. INSTA-FLEX has a different, less irritating odor compared to regular CAs, but still cannot be used on white foam. INSTA-FLEX has also proven to be superior when bonding anodized aluminum.

INSTA-FLEX+ clear rubber toughened has similar qualities to our black IC2000 but can be used in applications where you do not want the adhesive to be seen. The carbon component of IC2000 that gives the CA its black color also contributes to its unsurpassed strength. Since INSTA-FLEX+ has this carbon removed, its strength is a little less than IC2000 but still superior to standard CAs. When esthetics are important and a flexible bond is required, INSTA-FLEX+ is your best choice. It forms superior bonds to soft urethane and vinyl plastics. Both INSTA-FLEX and INSTA-FLEX+ work well when bonding R/C car tires. When a joint has a larger than normal gap, flexible CAs provide superior shock resistant bonds.

MANY STORE BRAND CA'S ARE MADE BY BSI. CHECK TO SEE IF THE \*NAME™ IS THE SAME

#### HINTS AND TIPS

Heat and moisture will decrease the shelf life of CAs. Unopened bottles can be stored in a freezer or refrigerator, but allow them to reach room temperature before using. Keep your bottles in a cool place that won't be exposed to direct sunlight and store away from bottles of accelerators. Due to the freshness of our CAs, their shelf life is guaranteed for 24 months.

For the initial opening of the top, loosen and retighten the top first to relieve internal pressure, then hold the bottle against a near vertical surface and cut off the top 1/32" with a knife or razor blade without squeezing the bottle. To prevent clogging, do not let the tip of the nozzle touch a surface that has been sprayed with INSTA-SET. Before replacing the colored cap, set the bottle down hard to knock the remaining CA back into the bottle before squeezing it in an upright position to blow air through the nozzle, then wipe the tip clean.

With all CAs, the closer the parts fit together, the stronger the bond. Always hold the bonding surfaces together as tightly as possible. Any rough spots on the mating surfaces should be

smoothed out. Although CAs will hold objects together with considerable strength within seconds, the full strength of the bond is not reached for several hours. Allow for this before subjecting parts to maximum stress. Also, CAs are generally a little less brittle and have higher strength when they are allowed to cure on their own.

- INSTA-CURE™ works very well with 3/4 oz. to 6 oz. fiberglass cloth for reinforcing joints. Lay the cloth on the surface and apply drops of the thin CA until capillary action saturates the fiberglass.
- Saturate the end of rope or string with thin CA to prevent it from becoming frayed.
- Cured CA is actually acrylic plastic. Thick CA with an accelerator can be used to quickly build up layers to replace or modify plastic parts. Unfortunately, neither CA or epoxy works well on most polyethylene or polypropylene, i.e., the flexible, waxy plastics.
- Small bits and shavings of plastics can be mixed with INSTA-CURE+™ to repair nicks and other damage to large plastic parts. Once cured, it can be sanded smooth to create a surface indistinguishable from the main part. This technique is used for the repair of vinyl automotive bumpers and allows the recycling of existing parts.
- R/C car tires that have been bonded to wheels using INSTA-CURE can be removed by putting them into boiling water.
- For the application of very small amounts of INSTA-SET accelerator, use our fine tip CA applicator for dispensing one drop at a time.
- Loosen and retighten the top to the CA bottle before cutting off the tip. This relieves any internal pressure from inside the bottle, which prevents CA from being forced out unintentionally.