CBPS-206
PROCESS SPECIFICATION

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ADHESIVE BONDING OF NUTPLATES, STUDS, STANDOFFS, CABLE TIE MOUNTS, BUSHINGS, AND OTHER FASTENERS

1. SCOPE

1.1 This process specification establishes procedures for bonding various studs, standoffs, cable tie mounts, nutplates, bushings, and other fasteners. The adhesives specified are 2-part acrylic and epoxy adhesives which cure at room temperature.

2. REQUIREMENTS

2.1 Materials

2.1.1 Adhesives

2.1.1.1 Pre-proportioned Adhesive Foil Pack Kit — Click Bond, Inc.
Click Bond CB91 Kit contains:
- 1 ea. CB200, 3.5-gram packet of unmixed Lord® 201 Base and Accelerator 17
- 1 ea. Mixing Stick
- 1 ea. Plastic Mixing Plate
- 1 ea. Mixing Instruction Card

Packaged in a Plastic Bag.

2.1.1.2 Pre-proportioned Adhesive Foil Pack Kit — Click Bond, Inc.
Click Bond CB92 Kit contains:
- 1 ea. CB200, 3.5-gram packet of unmixed Lord® 201 Base and Accelerator 17
- 1 ea. Mixing Stick
- 1 ea. Plastic Mixing Plate
- 1 ea. Solvent Wipe
- 1 ea. Abrasive Pad
- 1 ea. Mixing Instruction Card

Packaged in a Plastic Bag.

2.1.1.3 Pre-proportioned Adhesive Foil Pack Kit — Click Bond, Inc.
Click Bond CB93 Kit contains:
- 1 ea. CB300, 3.5-gram packet of unmixed Hardman Red Double Bubble® (Epoweld® 8173)
- 1 ea. Mixing Stick
- 1 ea. Plastic Mixing Plate
- 1 ea. Mixing Instruction Card

Packaged in a Plastic Bag.

2.1.1.4 Pre-proportioned Adhesive Dispenser Kit — Click Bond, Inc.
Click Bond CB200-40 Kit contains:
- 1 ea. 40-ml Dual Pack Cartridge of unmixed Lord® 201 Base and Accelerator 17

2.1.1.5	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB250-50 Kit contains:** **1 ea. 50-ml Dual Pack Cartridge of unmixed ITW Plexus™ MA300**	**Click Bond, Inc.**
2.1.1.6	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB301-50 Kit contains:** **1 ea. 50-ml Dual Pack Cartridge of unmixed Magnolia® 6301 Base and Accelerator**	**Click Bond, Inc.**
2.1.1.7	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB309-50 Kit contains:** **1 ea. 50-ml Dual Pack Cartridge of unmixed Lord® 309**	**Click Bond, Inc.**
2.1.1.8	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB359-50 Kit contains:** **1 ea. 50-ml Dual Pack Cartridge of unmixed Hysol® EA 9359.3**	**Click Bond, Inc.**
2.1.1.9	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB394-43 Kit contains:** **1 ea. 43-ml Dual Pack Cartridge of unmixed Hysol® EA 9394**	**Click Bond, Inc.**
2.1.1.10	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB420-10E Kit contains:** **1 ea. 10-ml Dual Pack Cartridge of unmixed Plexus® AO420/MA420 Base and Accelerator**	**Click Bond, Inc.**
2.1.1.11	**Pre-proportioned Adhesive Dispenser Kit** **Click Bond CB420-50E Kit contains:** **1 ea. 35-ml Dual Pack Cartridge of unmixed Plexus® AO420/MA420 Base and Accelerator**	**Click Bond, Inc.**
2.1.2	**Cleaning Solvent**	
2.1.2.1	**CB911 Solvent Wipe**	**Click Bond, Inc.**
2.1.2.2	**LPS® ZeroTri Super Cleaner/Degreaser**	**LPS Laboratories**
2.1.2.3	**Methylethylketone (MEK)**	**commercial**
2.1.2.4	**Diestone DLS**	**commercial**
2.1.2.5	**Solvent capable of removing surface contamination**	**commercial**
2.1.3	**Gloves**	
2.1.3.1	**Cotton, White**	**commercial**
2.1.3.2	**Plastic**	**commercial**
2.1.3.3	**Nitrile**	**commercial**
2.1.4	**Miscellaneous**	
2.1.4.1	**Aluminum Oxide abrasive paper (120 – 180 grit)**	**commercial**
2.1.4.2	**CB904 Abrasive Pad**	**Click Bond, Inc.**
2.1.4.3	**Masking Tape**	**commercial**
2.1.4.4	**CB902 Plastic Mixing Plate**	**Click Bond, Inc.**
2.1.4.5	**Plastic Mixing Container**	**commercial**
2.1.4.6	**CB903 Mixing Stick**	**Click Bond, Inc.**
2.1.4.7	**Clean, dry, lint free cloth, paper towel, or cheesecloth.**	**commercial**

2.2 Equipment

2.2.1	**Scale**	**commercial**
2.2.2	**Spatula**	**commercial**
2.2.3	**Manual Dispensing Tool, CB100**	**Click Bond, Inc.**
2.2.4	**Static Mixer Dispensing Tip, CB106**	**Click Bond, Inc.**
2.2.5	**Manual Flaring Tool, CB771**	**Click Bond, Inc.**

2.3 Process Flowchart – Processing shall be as shown in Figure 1.

STANDARD PROCEDURE

1. SOLVENT CLEAN
2. ABRADE (see section 2.4.2)
3. SOLVENT CLEAN
4. MIX AND APPLY ADHESIVE
5. ASSEMBLE PARTS
6. CURE
7. TOUCH UP FINISH

WET ABRASION PROCEDURE

1. WET AREA
2. ABRADE (see section 2.4.4.2)
3. RE-WET
4. WIPE
5. MIX AND APPLY ADHESIVE
6. ASSEMBLE PARTS
7. CURE
8. TOUCH UP FINISH

FIGURE 1. PROCESS FLOWCHART

TABLE I. SUBSTRATE PREPARATION AND OUT TIME

Unpainted Substrate	Abrasive Material	Solvent	Substrate Out Time
Aluminum	120-180 grit Aluminum Oxide	CB911/Acetone/MEK/ Diestone DLS	8 hrs.
Titanium	120 grit Aluminum Oxide	CB911/Acetone/MEK/ Diestone DLS	2 hrs.
Carbon Composite/Glass	120-180 grit Aluminum Oxide	CB911/Acetone/MEK/ Diestone DLS	8 hrs.
Stainless Steel	120-180 grit Aluminum Oxide	CB911/Acetone/MEK/ Diestone DLS	8 hrs.

2.4 Surface Preparation

2.4.1 General – All surfaces to be bonded shall be initially clean and free of oil, dirt, and other foreign materials.

2.4.2 Abrading Composites Substrates – Abrade composite materials with 120-180 grit aluminum oxide abrasive paper to remove surface gloss, mold release and resin high spots. CAUTION - Do not abrade into the fiber reinforcement.

2.4.3 Abrading Metallic Substrates – Abrade Aluminum, Stainless Steel, and Titanium substrates using 120-180 grit aluminum oxide abrasive paper to remove surface oxides, conversion coatings, primer, and topcoat. A 180 grit Aluminum oxide blast is also acceptable. Removal of the primer, topcoat, conversion coating, and any oxide is the preferred substrate preparation. Topcoat removal is essential. If complete primer removal isn't desirable, then lightly abrade the painted substrate with a 180-grit abrasive pad to remove surface gloss. CB200 should not be applied to bond directly to surface treatments (conversion coatings, i.e. Alodine treated aluminum).

2.4.4 **Solvent Cleaning – Remove abrading dust from all bonding surfaces by wiping with a CB911 solvent wipe, acetone, MEK or Diestone DLS. Immediately after solvent wiping, wipe with a clean, dry cloth.**

2.4.5 **Wet Abrading – Alternate surface abrasion method to 2.4.2 and 2.4.3 utilizes a solvent spray or solvent wipe process as shown in Figure 2.**

2.4.5.1 **Wet area to be abraded with solvent.**

2.4.5.2 **Immediately scour wet area with abrasive paper or abrasive pad, moving in small circular motion until solvent evaporates.**

Use 120-180 grit aluminum oxide abrasive paper to abrade bare fiberglass/epoxy or carbon/epoxy laminates or other composites. Remove surface gloss of matrix resin. CAUTION - do not abrade into the fiberglass or carbon fiber reinforcement.

2.4.5.3 **Removal of the primer, topcoat, conversion coating, and any oxide is the preferred substrate preparation. Topcoat removal is essential. If complete primer removal isn't desirable, then lightly abrade the painted substrate with a 180-grit abrasive pad to remove surface gloss.**

2.4.5.4 **Wet area again to mobilize abrasion residue.**

2.4.5.5 **Immediately wipe wet area with clean paper or cheesecloth wipe, using single stroke motion while rolling wipe away from surface.**

2.4.5.6 **Repeat wipe with clean wiper, dampened with solvent, until no residue is apparent on wiper.**

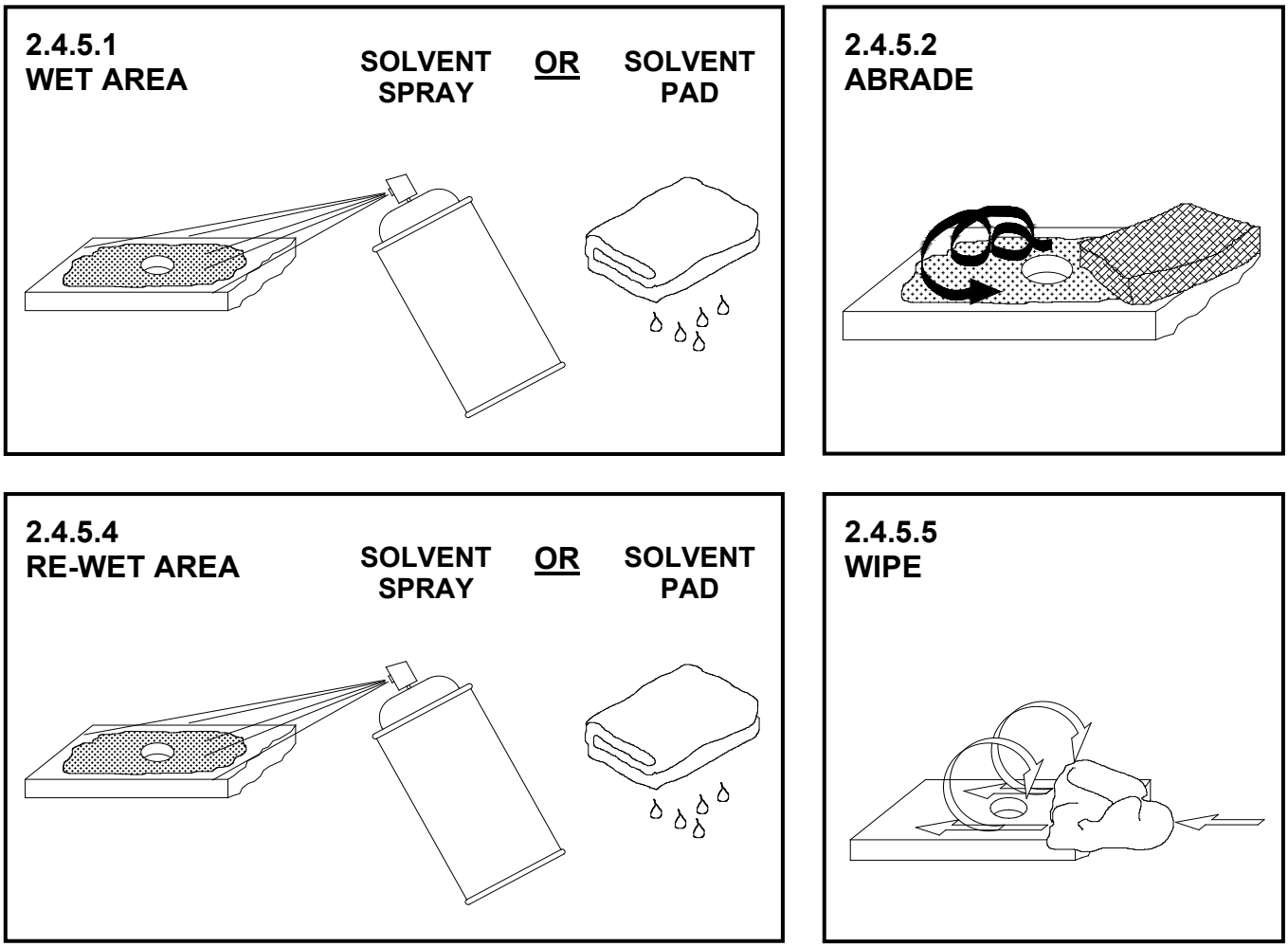


FIGURE 2. WET ABRASION PROCEDURE

2.5 Adhesive Mixing

2.5.1 Pre-proportioned Adhesive Foil Pack Kit – When using Click Bond CB91, CB92, or CB93 pre-proportioned adhesive kit, proceed as follows:

a. **Using the CB903 mixing stick, flatten one end of the packet to move contents toward the opposite end.**

b. **Tear off a strip from the flattened end to open both compartments.**

c. **Fold packet in half lengthwise.**

d. **Lay the folded packet on the CB902 plastic mixing sheet and push out the entire contents using the edge of the mixing stick. Press down hard with the mixing stick to make sure all of both components are removed as shown in Figure 3.**

e. **Prior to mixing, visually inspect the component material condition by examining deposit on plastic mixing sheet and probing with the end of the mixing stick. Components should have an even consistency and be free of lumps and striations.**

f. **Mix the 2 components together thoroughly. Wipe the stick against the plastic sheet several times during mixing to get all the clinging components mixed in. Mix until uniform in color.**

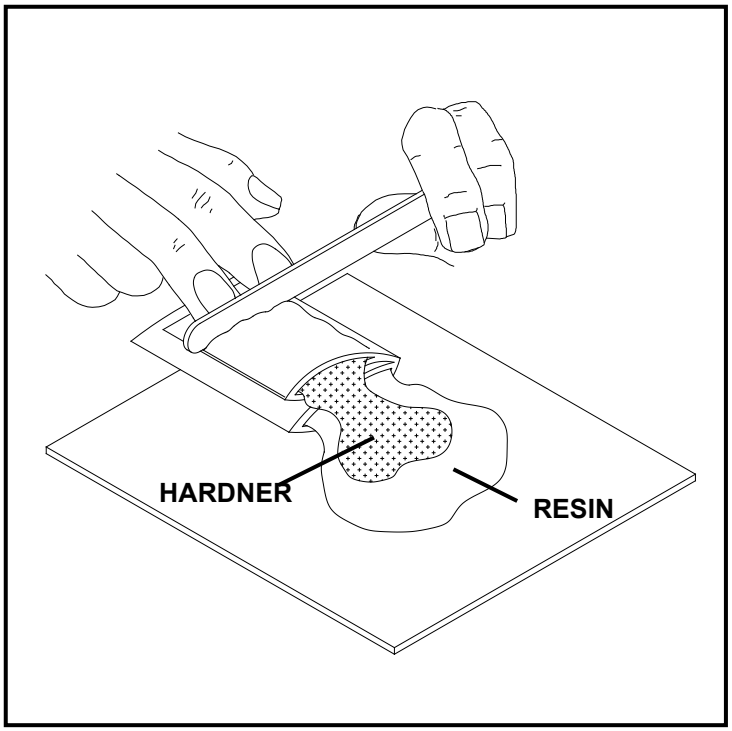


FIGURE 3. CLICK BOND CB200 AND CB300 MIXING METHOD

2.5.2 **<u>Pre-proportioned Adhesive Dispenser Kit</u> – Refer to Table II to select the appropriate adhesive applicator for the adhesive dispenser kit being used. Figure 4 shows the adhesive applicator components.**

a. Place the cartridge into the retaining slot of the tool and lock the cartridge in place with the retainer.

b. Remove the endcap on the adhesive cartridge by turning the endcap counterclockwise. Retain the endcap for later use.

c. Actuate the tool to dispense a small amount of adhesive into the plastic packaging bag. Ensure that both components are flowing from the cartridge. Visually inspect the condition of the component materials by examining the adhesive through the plastic bag and kneading the adhesive through the bag wall with your fingers. Both components should have an even consistency and be free of striations and lumps.

d. Attach the static mixer dispensing tip to the end of the cartridge and secure the mixing tip by turning clockwise.

e. Insert the end of the static mixer dispensing tip into the plastic bag and actuate the tool until a small amount of adhesive flows from the mixing tip.

f. Apply adhesive to the attachment part by dispensing from the static mixer dispensing tip. The applicator proportions the proper component ratio and mixes the adhesive as it is dispensed.

g. To keep CB200, CB250, CB301, and CB420E adhesive from curing in the static mixer dispensing tip make sure that at least 1 gram of adhesive is dispensed in each 3-minute time period. If necessary, dispense this adhesive into the plastic bag for disposal.

h. At the end of use, remove the dispensing tip from the cartridge. Wipe the residual adhesive from the end of the cartridge and replace the endcap to preserve the unmixed adhesive for later use with another dispensing tip. Place the used dispensing tip in the plastic bag with the waste adhesive for disposal. Any unmixed adhesive components in the bag may be mixed together by kneading the bag. This will result in the eventual cure of the material and allow for disposal as a solid waste.

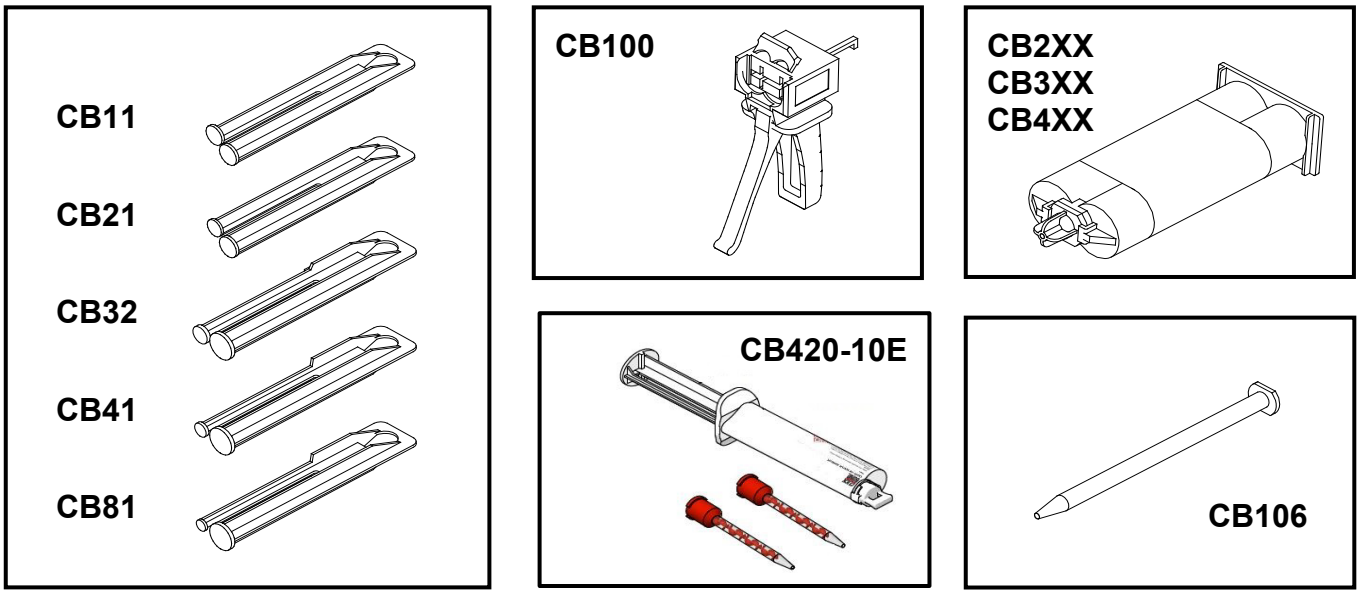


FIGURE 4. ADHESIVE APPLICATOR COMPONENTS

TABLE II. ADHESIVE APPLICATOR SELECTION

ADHESIVE CARTRIDGE	MANUAL POWERED DISPENSER			STATIC MIXING TIP
	COMPLETE	HANDLE *	SLIDE *	
CB200-40	CB100-81	CB100	CB81	CB106
CB250-50	CB100-11	CB100	CB11	CB106
CB301-50	CB100-21	CB100	CB21	CB106
CB309-50	CB100-11	CB100	CB11	CB106
CB359-50	CB100-21	CB100	CB21	CB106
CB394-43	CB100-41	CB100	CB41	CB106
CB420-50E	CB100-81	CB100	CB81	CB106

*** INDIVIDUAL COMPONENTS MAY BE PROCURED USING THESE PART NUMBERS**

2.5.3 **CB420-10E Pre-proportioned Adhesive Dispenser Kit – The CB420-10E dispenser kit is supplied with a cartridge with a manual powered dispenser and static mixers.**

a. Remove the endcap on the adhesive cartridge by turning the endcap counterclockwise.

b. Actuate the tool to dispense a small amount of adhesive into the plastic packaging bag. Ensure that both components are flowing from the cartridge. Visually inspect the condition of the component materials by examining the adhesive through the plastic bag and kneading the adhesive through the bag wall with your fingers. Both components should have an even consistency and be free of striations and lumps.

c. Attach the static mixer dispensing tip to the end of the cartridge and secure the mixing tip by turning clockwise.

d. Insert the end of the static mixer dispensing tip into the plastic bag and actuate the tool until a small amount of adhesive flows from the mixing tip.

e. Apply adhesive to the attachment part by dispensing from the static mixer dispensing tip. The applicator proportions the proper component ratio and mixes the adhesive as it is dispensed.

2.6 Adhesive Application

2.6.1 Stud, Standoff, and Cable Tie Mount (Standard Fixture)

2.6.1.1 Solvent wipe the composite, thermoplastic, or primed fastener base. If the metallic fastener base is not primed, lightly abrade bonding surface with CB904 abrasive pad and solvent wipe to remove surface oxide layer.

2.6.1.2 Remove the peel ply from foam tape pads and discard. Apply the mixed adhesive to the fastener baseplate.

2.6.1.3 Apply the mixed adhesive as a built-up spot to the center of the stud, standoff, or cable tie mount baseplate bonding area as indicated in Figure 5. The quantity of adhesive applied should be just sufficient to provide the squeeze out of a small amount of excess adhesive completely around the circumference of the baseplate. See Table III for approximate adhesive spot diameters for each baseplate size.

TABLE III. BASEPLATE SIZE vs ADHESIVE SPOT DIAMETER (INCHES)

BASEPLATE SIZE (mm)	ADHESIVE SPOT DIAMETER (mm)
.62 (15,9)	.38 (9,7)
1.25 (31,8)	.62 (15,9)

2.6.1.4 Figure 5 indicates the sequential steps required to attach the Click Bond Pressure Application Fixture (PAF) to the substrate and to activate the fixture to put bonding pressure on the fastener baseplate.

2.6.1.5 Locate the fixture on the substrate using a template or by aligning the index marks on the fixture with the fastener location centerlines. Press down on the outer body of the fixture to adhere the foam tape to the surface.

2.6.1.6 Press down on the inner body of the fixture to actuate. Do not press on the protruding fastener. The over-center action of the fixture squeezes out the adhesive and holds the fastener in place while the adhesive cures.

2.6.1.7 After the adhesive has cured, remove the fixture by grasping with pliers and pulling it off the substrate. Discard the fixture.

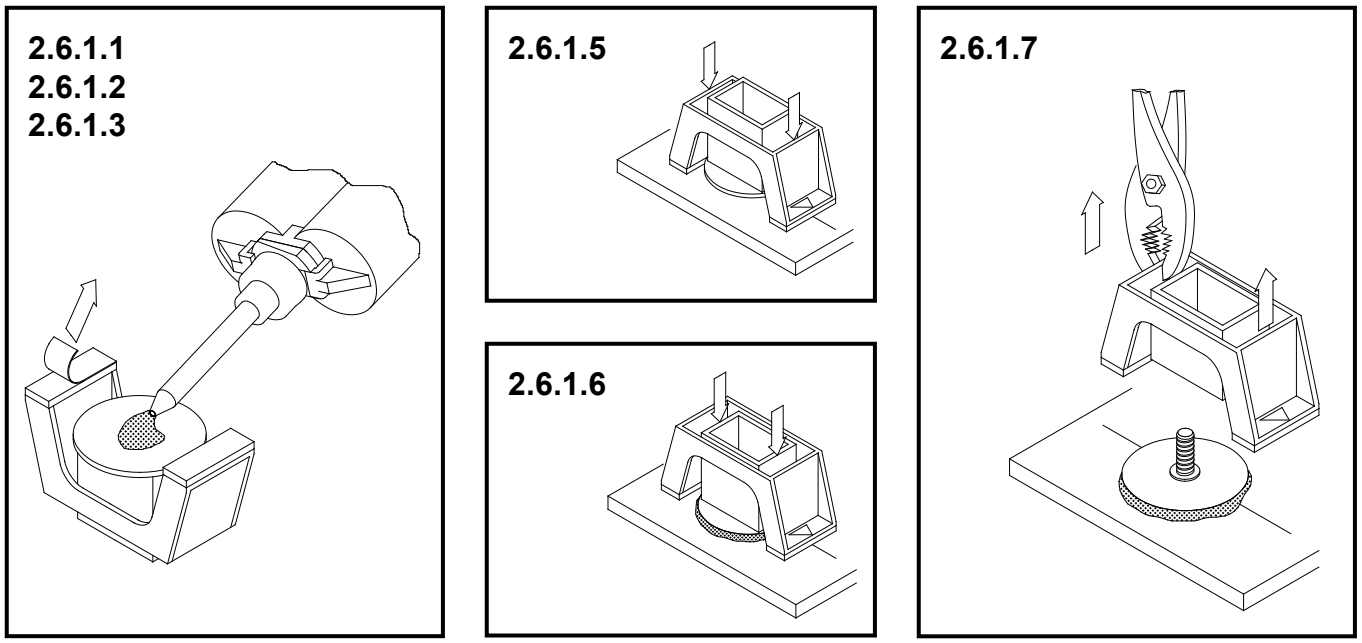


FIGURE 5. PROCEDURE FOR ATTACHMENT OF CLICK BOND FASTENER

2.6.2 Stud, Standoff, and Cable Tie Mount (Internal Fixture)

2.6.2.1 Solvent wipe the fastener base, then wipe dry with a clean dry cloth. If the metallic fastener base is not primed, lightly abrade bonding surface with CB904 abrasive pad and solvent wipe to remove surface oxide layer, then wipe dry with a clean dry cloth.

2.6.2.2 Remove the peel ply from the centrally located taped disk or fixture tape and discard.

2.6.2.3 Apply a bead of adhesive to the outer ring of the baseplate. The quantity of adhesive applied should be sufficient to fully cover the baseplate. Caution: Do not apply adhesive on fixture tape or so close to the fixture that when installing the fastener, the adhesive spreads over the tape before it attaches to the substrate.

2.6.2.4 Locate the fastener on the substrate using a template or by centering the baseplate on cross marks placed on substrate. Press down on the fastener to actuate the internally located fixture. Note: The action of the fixture squeezes out the adhesive and holds the fastener in place with positive pressure during the adhesive cure.

2.6.2.5 Verify adhesive coverage by observing a visible adhesive ring around the entire perimeter of fastener base.

2.6.2.6 Let cure. Caution: Do not disturb part until adhesive is cured.

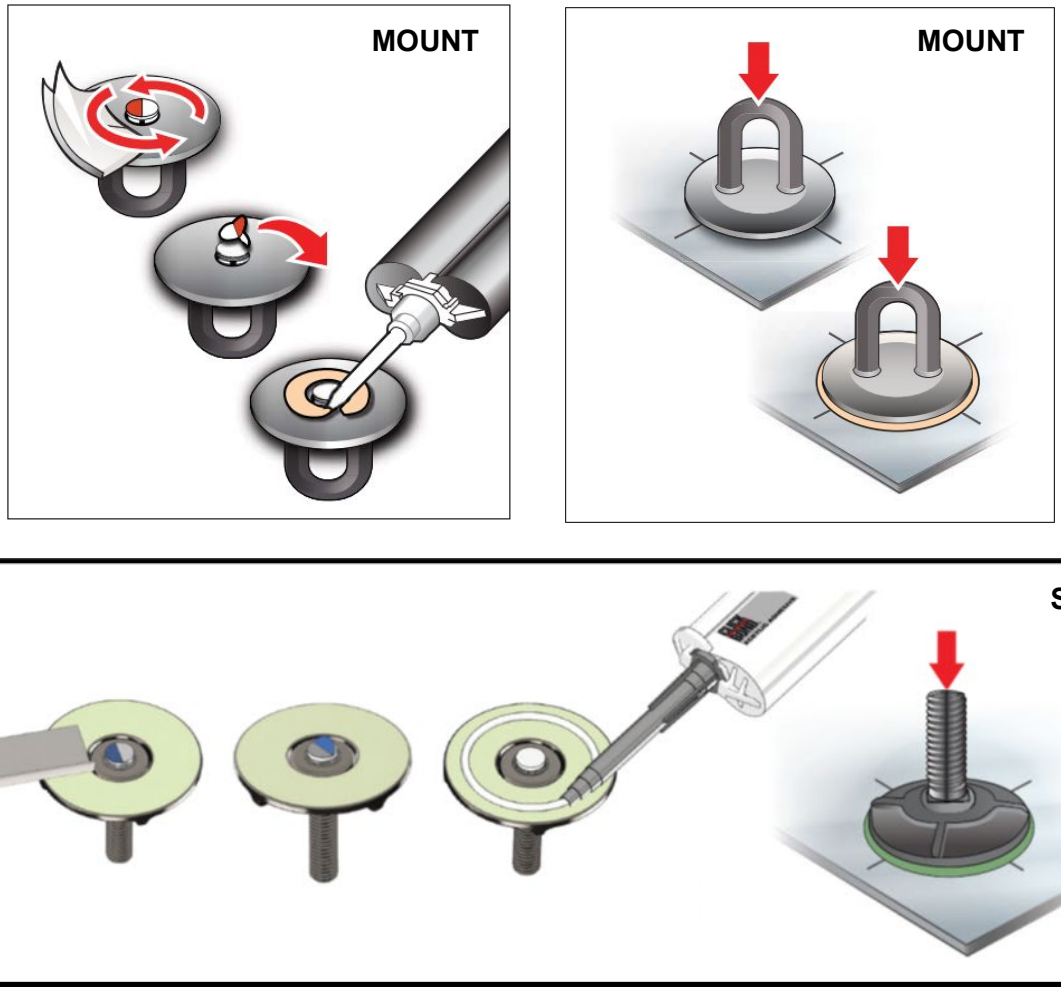


FIGURE 6. PROCEDURE FOR ATTACHMENT OF INTERNALLY FIXTURED FASTENERS

2.6.3 **<u>Nutplates</u> – Two types of nutplates are supplied by Click Bond, the standard surface mount type and the sleeved type.**

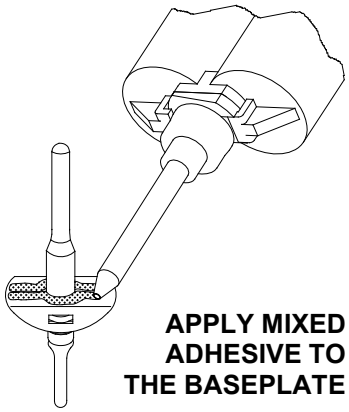
2.6.3.1 **Nutplate – Standard type. Figure 7 indicates the sequential steps required to install the standard surface mount type nutplate.**

2.6.3.1.1 **Solvent wipe the base of the composite or primed nutplate base. If the nutplate base is metallic and not primed, lightly abrade with CB904 abrasive pad and solvent wipe to remove surface oxide layer. <u>Do not abrade composite nutplate bases with CB904.</u>**

2.6.3.1.2 **Apply the mixed adhesive as two linear beads along the long axis of the nutplate baseplate as shown in Figure 7(1). One bead should pass around each side of the installation fixture, and the amount of material in the beads should be controlled to give a small and uniform amount of material squeeze out when the nutplate is pulled into position against the substrate as shown in Figure 7(2).**

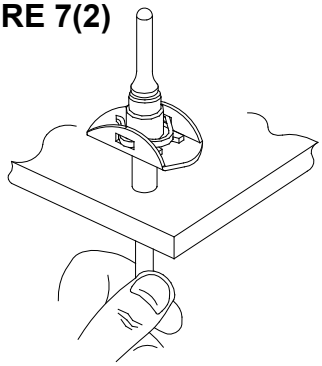
2.6.3.1.3 **Each nutplate is furnished with an integral, disposable, elastomeric installation fixture to align and hold the nutplate to the surface and keep adhesive out of the hole and threads. This fixture may be removed as soon as the adhesive cures as in Figure 7(3), or left in place as a paint mask until after painting the detail part.**

FIGURE 7(1)



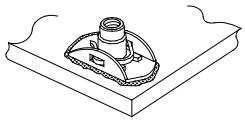
APPLY MIXED ADHESIVE TO THE BASEPLATE

FIGURE 7(2)



PULL FIXTURE THROUGH HOLE IN THE SUBSTRATE

FIGURE 7(3)



AFTER THE ADHESIVE HAS CURED, REMOVE FIXTURE FROM THE NUTPLATE AND DISCARD.

FIGURE 7. PROCEDURE FOR INSTALLATION OF STANDARD TYPE NUTPLATE

2.6.3 Nutplates (CONTINUED)

2.6.3.2 Nutplate – Sleeved type. Figure 8 indicates the sequential steps required to install the sleeved type nutplate.

2.6.3.2.1 Apply the mixed adhesive as two linear beads along the long axis of the nutplate baseplate as shown in Figure 8(1). One bead should pass around each side of the protruding sleeve, and the amount of material in the beads should be controlled to give a small and uniform amount of material squeeze out when the nutplate is pushed into position against the substrate as shown in Figure 8(2).

2.6.3.2.2 Each nutplate is furnished with an integral, disposable pull stem that holds the nutplate in place during the sleeve flare operation. Form the flare in the sleeve with the CB771 Flaring Tool as shown in Figure 8(3). Figure 8(4) depicts the completed installation, with the flared sleeve holding the nutplate in place while the adhesive cures.

FIGURE 8(1)

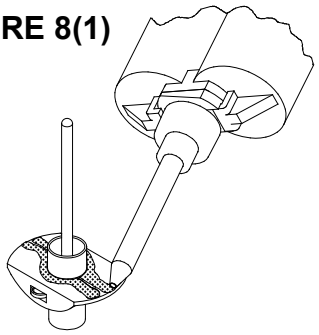


FIGURE 8(2)

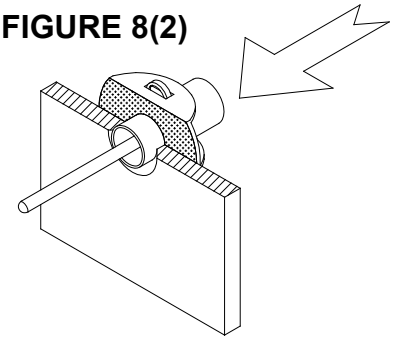


FIGURE 8(4)

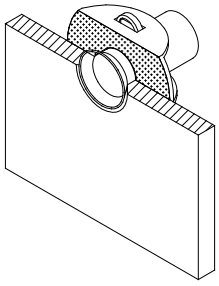


FIGURE 8(3)

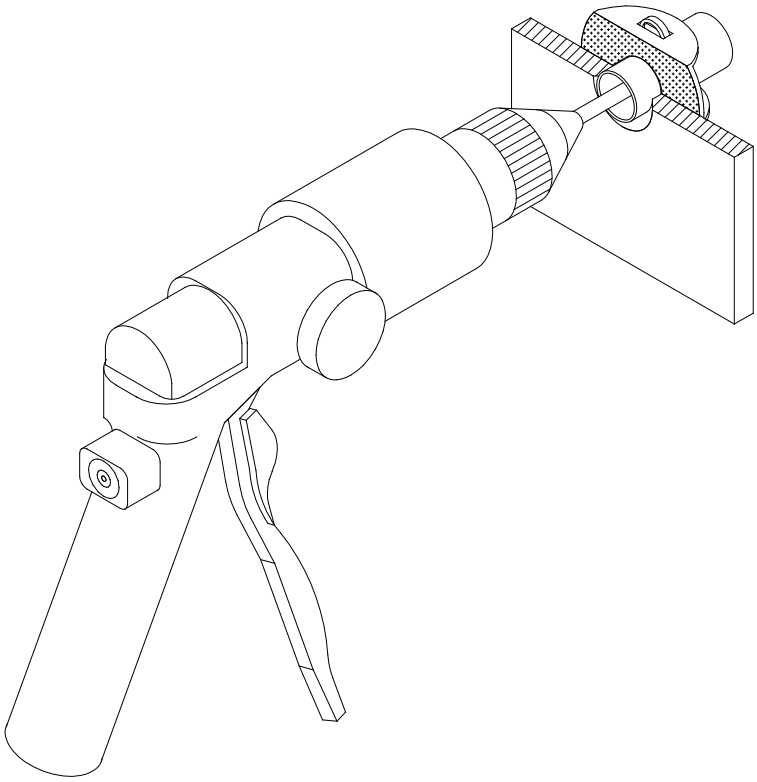


FIGURE 8. PROCEDURE FOR ATTACHMENT OF SLEEVED TYPE NUTPLATE

2.6.4 Bushings

2.6.4.1 Bushings – Disposable Plastic Pressure Application Fixture (PAF) type. Figure 8 indicates the sequential steps required to attach the Click Bond fixture to the substrate and to activate the fixture to put bonding pressure on the fastener baseplate.

2.6.4.1.1 Solvent wipe the fastener baseplate. If the metallic bushing base is not primed, lightly abrade with CB904 abrasive pad and solvent wipe to remove surface oxide. Remove the peel ply from foam tape on the fixture and discard the peel ply. Apply the mixed adhesive to the fastener baseplate. The adhesive bead should completely circle the bushing nose.

2.6.4.1.2 Attach the fixture to the substrate by aligning the bushing nose with the hole in the substrate and pushing down on the outer body of the fixture to adhere the foam tape to the surface. (When installing fasteners with very short bushing noses, activate the fixture prior to attaching the fixture to the substrate to allow sufficient nose protrusion to locate the hole in the substrate.

2.6.4.1.3 Press down on the inner body of the fixture to actuate. Over-center action squeezes out the adhesive and holds the fastener in place while the adhesive cures.

2.6.4.1.4 After the adhesive has cured, remove the fixture by grasping with pliers and pulling it off of the substrate. Discard the fixture.

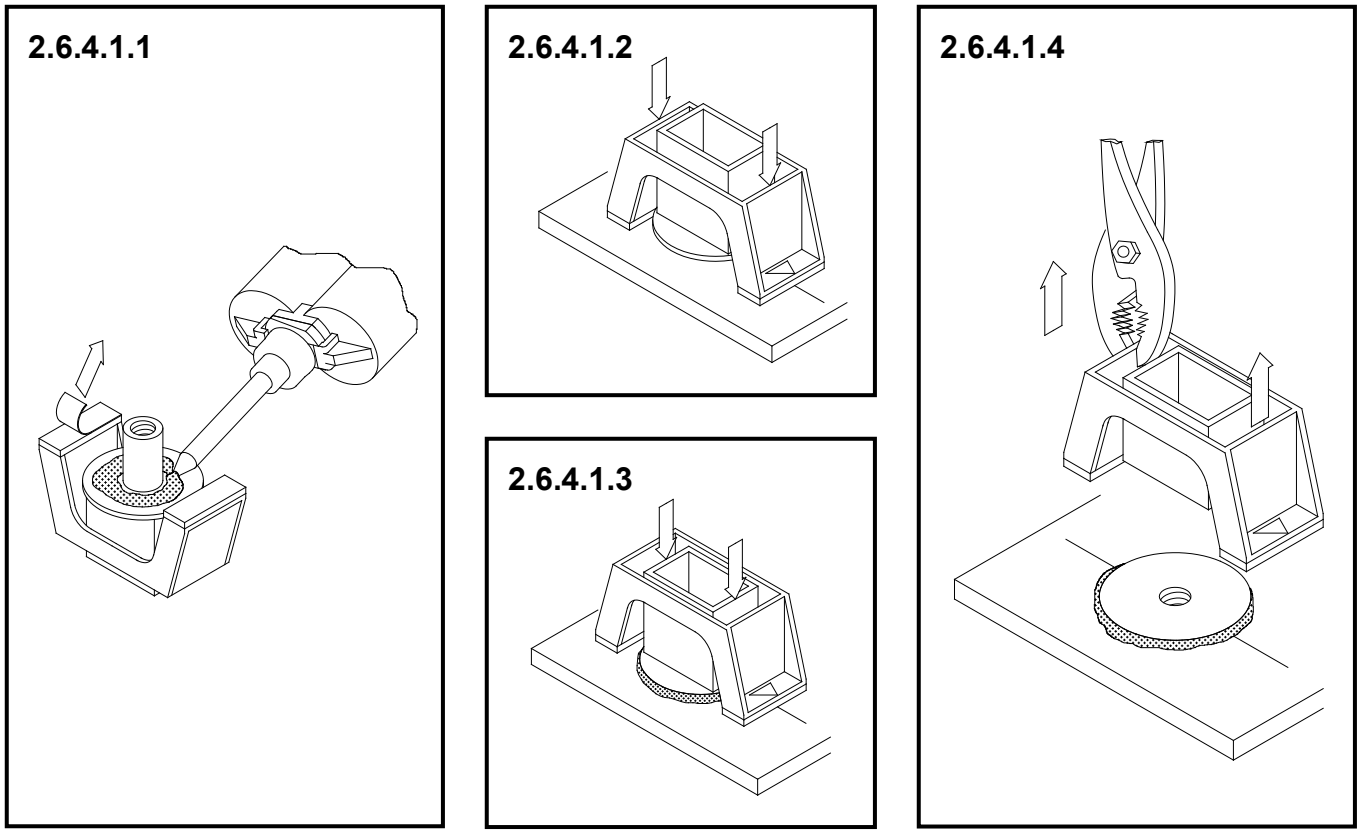


FIGURE 9. PROCEDURE FOR ATTACHMENT OF CLICK BOND BUSHING

2.6.4 Bushings (CONTINUED)

2.6.4.2 Bushings – Elastic Pressure Application Fixture (PAF) type. Figure 9 indicates the sequential steps required to install this type bushing.

2.6.4.2.1 Remove the plastic fixture ring from the elastic fixture.

2.6.4.2.2 Solvent wipe the fastener baseplate. If the metallic bushing base is not primed, lightly abrade with CB904 abrasive pad and solvent wipe to remove surface oxide.

2.6.4.2.3 Apply the mixed adhesive to the bushing baseplate. The adhesive bead should completely circle the bushing nose.

2.6.4.2.4 Insert the fixture into the hole in the substrate.

2.6.4.2.5 Slide the fixture ring over the end of the fixture, apply tension to the fixture, and slide the fixture ring against the substrate.

2.6.4.2.6 Allow the adhesive to cure, then remove the fixture and the fixture ring and discard.

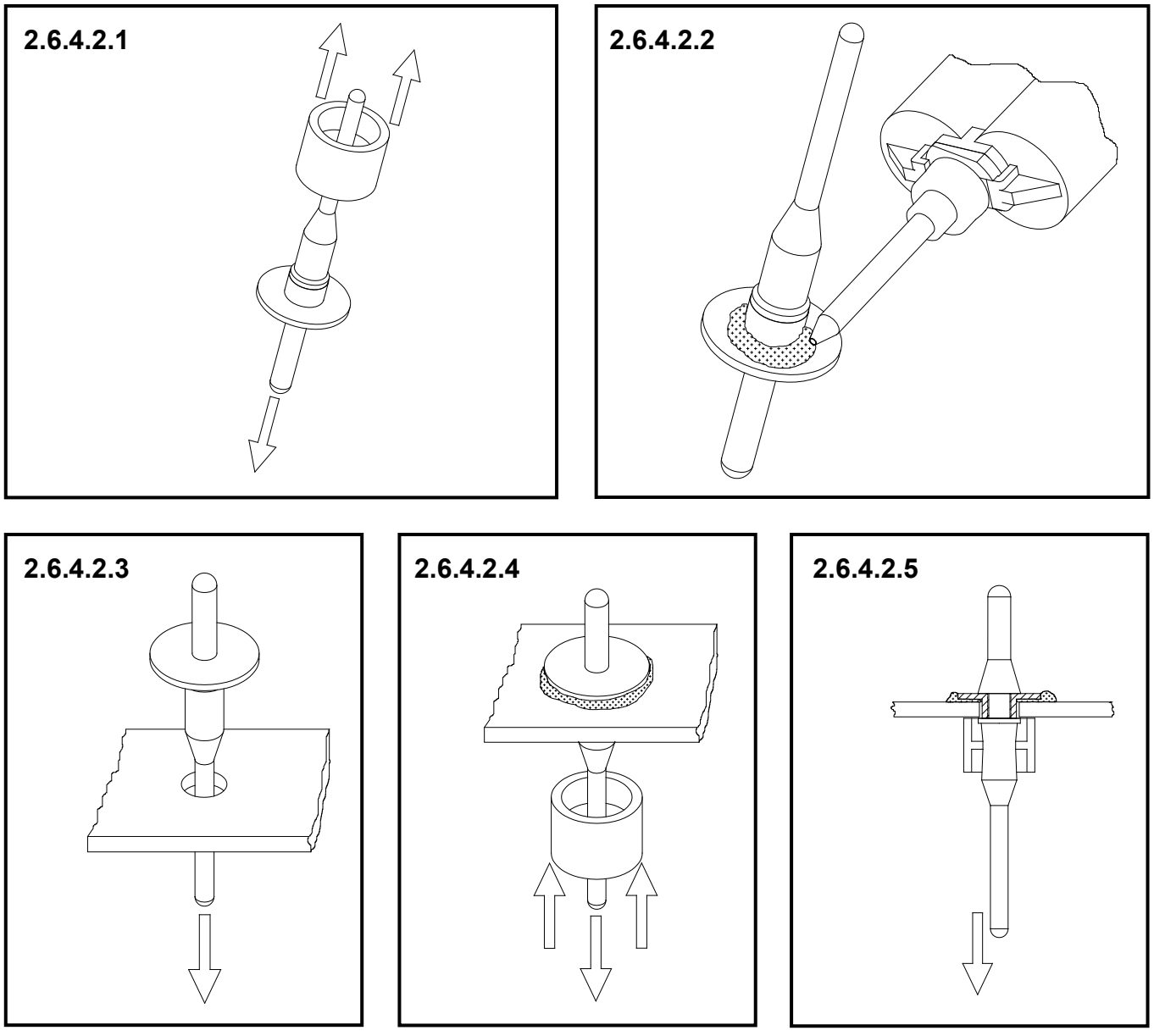


FIGURE 10. PROCEDURE FOR ATTACHMENT OF CLICK BOND BUSHING

2.6.4 Bushings (CONTINUED)

2.6.4.3 Bushings – Spacer Insert Panel Bushing type. Figure 10 indicates the sequential steps required to install this type bushing.

2.6.4.3.1 Prepare the substrate surfaces for adhesive bonding. Remove the projecting core material from the hole so that it will not become trapped between the spacer bushing and the bushing cap. Remove the bushing cap from the elastic fixture and solvent wipe the bonding surfaces of the bushing cap and the spacer insert.

2.6.4.3.2 Solvent wipe the fastener baseplate. If the metallic bushing base is not primed, lightly abrade with CB904 abrasive pad and solvent wipe to remove surface oxide.

2.6.4.3.3 Apply adhesive beads to the bonding surface of the spacer bushing and the bushing cap. The adhesive beads should completely circle the bushing nose and the bushing cap nose.

2.6.4.3.4 Feed the fixture tail through the hole in the substrate and the bushing cap. Stretch the elastic fixture by pulling on the fixture tail. This reduces the fixture diameter and allows the bushing cap to be slid into place against the substrate. Ensure that both the spacer bushing and the bushing cap are seated against the substrate surfaces and release the pull on the fixture.

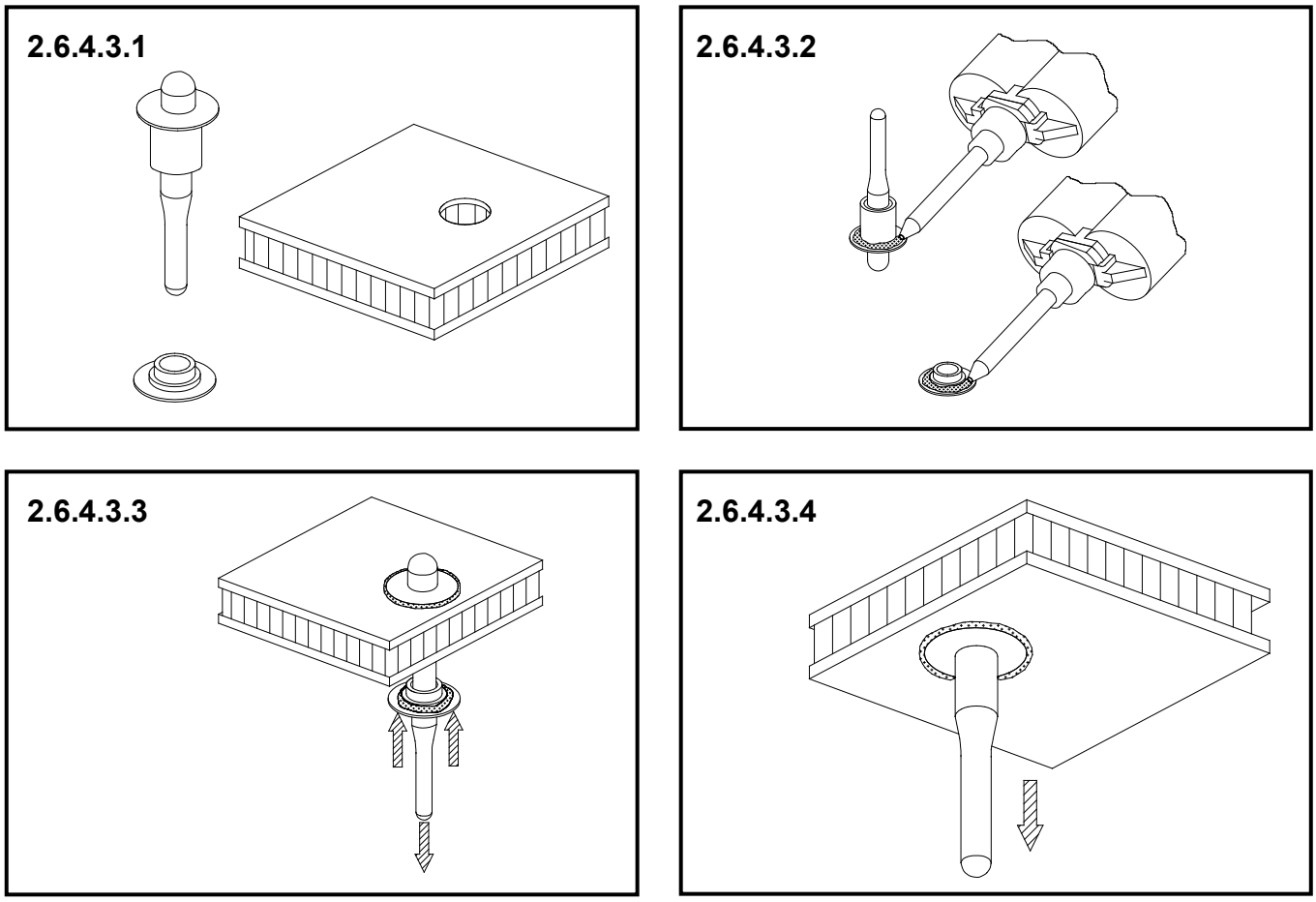


FIGURE 11. PROCEDURE FOR ATTACHMENT OF CLICK BOND SPACER INSERT PANEL BUSHING

2.6.4 Bushings (CONTINUED)

2.6.4.4 Bushings – Nutplate Spacer Insert Panel Bushing type. Figure 11 indicates the sequential steps required to install this type fastener.

2.6.4.4.1 Prepare the substrate surfaces for adhesive bonding. Remove the projecting core material from the hole so that it will not become trapped between the nutplate and the bushing cap. Remove the plastic retainer/bushing cap assembly from the elastic fixture and solvent wipe the bonding surfaces of the nutplate and the bushing cap.

2.6.4.4.2 Solvent wipe the fastener baseplate. If the metallic bushing base is not primed, lightly abrade with CB904 abrasive pad and solvent wipe to remove surface oxide.

2.6.4.4.3 Apply adhesive beads to the bonding surface of the nutplate and the bushing cap. The adhesive beads should completely circle the bushing nose on the nutplate and the bushing nose on the cap.

2.6.4.4.4 Feed the fixture tail through the hole in the substrate and the bushing cap/plastic retainer assembly. Stretch the elastic fixture by pulling on the fixture tail. This reduces the fixture diameter and allows the bushing cap to be slid into place against the substrate. Ensure that both the nutplate assembly and the bushing cap are engaged and seated against the substrate surfaces before releasing pull on the fixture.

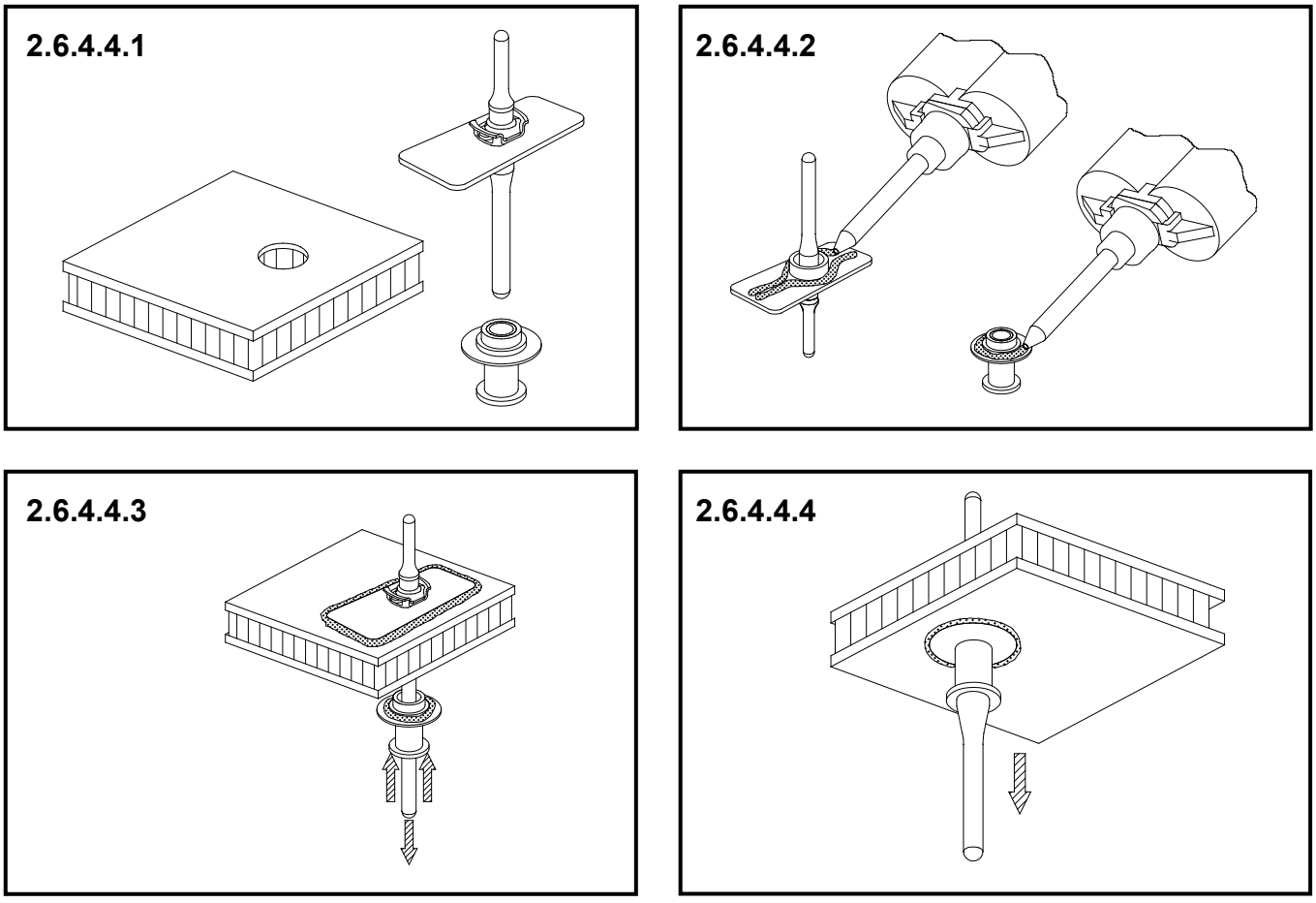


FIGURE 12. PROCEDURE FOR ATTACHMENT OF CLICK BOND NUTPLATE SPACER INSERT PANEL BUSHING

2.7 **Adhesive Cure – The approximate cure times at 75°F of the adhesives shall be as specified in Table IV. Since the curing rate of all the adhesives is very sensitive to the ambient temperature at the application site, it is recommended that the leftover adhesive in the mixing container or on the mixing sheet be monitored at the application site before removing and discarding the fastener holding fixture.**

TABLE IV. ADHESIVE CURE TIME TO HANDLING STRENGTH *

MATERIAL DESIGNATION	CURE TIME
CLICK BOND CB91 (CB200)	30 MINS
CLICK BOND CB92 (CB200)	30 MINS
CLICK BOND CB93 (CB300)	15-30 MINS
CLICK BOND CB200-40	30 MINS
CLICK BOND CB250-50	30 MINS
CLICK BOND CB301-50	24 HOURS
CLICK BOND CB309-50	8-16 HOURS
CLICK BOND CB359-50	24 HOURS
CLICK BOND CB394-43	24 HOURS
CLICK BOND CB420-10E	15-18 MINS
CLICK BOND CB420-50E	15-18 MINS

*** HANDLING STRENGTH – CURE EXCEEDS 75% OF ULTIMATE STRENGTH**

TABLE V. ADHESIVE CURE TIME TO FULL CURE

MATERIAL DESIGNATION	CURE TIME
CLICK BOND CB91 (CB200)	24 HOURS
CLICK BOND CB92 (CB200)	24 HOURS
CLICK BOND CB93 (CB300)	24 HOURS
CLICK BOND CB200-40	24 HOURS
CLICK BOND CB250-50	24 HOURS
CLICK BOND CB301-50	7 DAYS
CLICK BOND CB309-50	48 HOURS
CLICK BOND CB359-50	5-7 DAYS
CLICK BOND CB394-43	3-5 DAYS
CLICK BOND CB420-10E	24 HOURS
CLICK BOND CB420-50E	24 HOURS

2.8 **Surface Touch Up – After completion of the cure, all surfaces not within the joint that have had the surface treatment or organic finish removed shall have the same or equivalent treatment or finish reapplied.**

2.9 **In-Process Removal Procedure for Studs/Nutplates**

2.9.1 **Refer to CBPS-207 for the procedure to remove Click Bond fasteners.**

2.9.2 **After removing the fastener, clean off any remaining adhesive and reapply new fastener in accordance with the applicable procedure.**

2.10 **Safety and Environmental Compliance**

2.10.1 **The storage, handling, use, transportation, and disposal of goods, supplies, materials, articles, items, equipment, machines, tools, parts, components, assemblies, chemicals, and processes referenced herein shall comply with all applicable national/international, federal, state, and local health, safety, and environmental laws, ordinances, rules, regulations, and codes.**

3. QUALITY ASSURANCE PROVISIONS

3.1 Visual Examination

3.1.1 **Visual examination of the adhesive components in the containers shall indicate the material has not gelled, become hard, or settled out to the point where agitation will not restore it to a homogeneous mixture.**

3.1.2 **Visual examination of the adhesive components as they are dispensed from the pre-proportioned adhesive kits at the point of use shall indicate that the material has not gelled, become hard, or settled out. The consistency of the material shall be tested manually as described in 2.5.1e or 2.5.2c to ensure that it is suitable for application.**

3.1.3 **All exposed edges of bonded parts shall show a continuous adhesive bead squeeze out along the joined surfaces.**

3.1.4 **Excess adhesive squeezed out of the joint shall be tested with a fingernail for cure. The adhesive shall feel tough and offer resistance to penetration and shall not be tacky.**

3.1.5 **Click Bond, Inc. offers proof load test tools for bonded fasteners. Consult your local sales engineer for guidance to the best solution for your individual application and training of verification tools.**