Company Name	CLICK BOND, INC.
Model Number	Studs, Stand-Offs, Cable Tie-Mounts, Insulation Pin,
	Flush Deck Ring, Fixed Ring, Stauff Mount Bases
PDA Number	21-2171467-PDA
Issuance date	18-Oct-2021
Expiration date	17-Oct-2026
Revision number	0



Task – T2171467 Product Design Assessment (PDA) Click Bond Fastener, Bonded PDA No. 21-2171467-PDA

Attention: Mr. Dan Lupton, Click Bond, Inc. (WCN: 964264)

The documents shown in the attached list are reviewed in accordance with the applicable requirements indicated in the PDA along with the service restrictions and comments.

We recommend that you monitor the ABS Rules, Guides and other standards used in the Assessment. These Rules, Guides and standards often change on an annual basis, and you must comply with the new Rules, Guides and standards in order for the product to be used on an ABS classed vessel or facility contracted under the new Rules, Guides or specifications.

Additionally, we acknowledge the PDA request form warranting that the materials used in the product are free from asbestos.

For any clarifications, contact John Deng at (281) 877-6329, JDeng@eagle.org

Very truly yours,

Joshua Divin Vice President of Engineering

Electronically Signed by: Suresh Pisini

Documents List

Drawing No.	Rev.	Title	Status
cb200 data sheet	-	cb200 data sheet	File for Reference
cb420 data sheet	-	cb420 data sheet	File for Reference
cbps-244	7	cbps-244	File for Reference
cb4567	0	Mount, Cable Tie, Double, Large	Reviewed
cb3200	5	Stud, Very Large, Adhesive Bonded	Reviewed
cb3019	19	Mount, Cable Tie	Reviewed
cb4595	8	Base, Mounting, Adhesive Bonded	Reviewed
cb9120	6	Mount, Cable Tie Anchor	Reviewed
cb9205	6	Loop, Strap Fastener	Reviewed
cb9151	2	Mount, Cable Tie Anchor, Transverse	Reviewed
		Base	
cb9522	10	Stud, Adhesive Bonded, Self Fixturing	Reviewed
cb9715	8	Stud, Adhesive Bonded, Self Fixturing.	Reviewed
cm319	0	Mount, Cable Tie.	Reviewed
cm905	0	Loop, Strap Fastener	Reviewed
cm920	0	Mount, Cable Tie Anchor.	Reviewed
cm951	1 0 Mount, Cable Tie Anchor, Transverse		Reviewed
		Base	
cn200	2	Standoff, Very Large Base, Adhesive Bonded	Reviewed
cn125	13	Standoff, Adhesive Bonded	Reviewed
cs120	2	Pin, Insulation Mount	Reviewed
cm459	9	Assembly, Stauff Clamp Mount	Reviewed
cs922	3	Stud, Adhesive Bonded. Self Fixturing	Reviewed
cs200	13	Stud, Very Large Base, Adhesive	Reviewed
		Bonded	
cs125	12	Stud, Adhesive Bonded	Reviewed

ETR16_019	-	American Bureau of Ships (ABS) Adhesive Bonded Fastener Certification Test of CS450 Self- Fixturing Studs	Reviewed
ETR15_008	-	Baseline testing of CB9788CRMP (CM988CRMP) flush tie down rings in tension and CB9789CRM5P (CM989CRM5P) fixed tie down rings in tension and lateral shear bonded with cb200 and cb420 acrylic adhesives	Reviewed
ETR16_031	-	Tensile and offset shear testing of cast base CB9715/CS915 studs bonded with cb420 acrylic adhesive to bare steel after room temperature and hot/wet conditioning	Reviewed
EPR-523 Data	-	CB420 Lap Shear, Push-Out, and torque data	Reviewed
EPR-569 Data	-	CB420 Tension data with CB9715 stud	Reviewed
ETR03-041	-	Tensile, Peel, Modified Shear and Shear testing of Click Bond Adhesive Bonded Fasteners bonded to shipboard materials with AO420 adhesive	Reviewed
ETR03-057	-	Tensile testing of cb9522cr10-10 deckboard mounting studs Bonded with cb200 adhesive to 3/8 inch steel plate Hot/wet conditioned for 30 days	Reviewed
ETR08-022	-	Tensile testing and 3 inch modified shear testing of CS200-51618- 16CR125 studs bonded with CB200 adhesive to 1/2 inch steel substrate	Reviewed
ETR08-049	-	Tensile and Shear testing of CS200- 3816-24CR studs and CS200- 3816CR125 studs bonded with CB200 to aluminum	Reviewed
ETR08-055	-	Shear testing and tensile testing of CB9522CR10P16 and CS200-3816- 16CR studs bonded with CB200 adhesive to steel and aluminum substrates	Reviewed

ETR11-009	-	Tensile and offset shear testing of cast base cb9715 studs bonded with cb420 acrylic adhesive to bare steel after room temperature and hot/wet conditioning	Reviewed
ETR12-013	-	Room and elevated temperature tensile testing of CB200-1213-16CR studs bonded with CB420 adhesive	Reviewed
ETR16-031	-	Tensile and offset shear testing of cast base CB9715/CS915 studs bonded with CB420 to bare steel after room temperature and Hot/Wet conditioning	Reviewed
ETR20_003	-	CB9715 and CS922 studs at temperature and salt fog testing	Reviewed
ETR20-008	-	Shear testing of CB9715CRM6-24P studs at room temperature and 140° F (60° C)	Reviewed
ETR97-0050	-	Tension testing of Click Bond CB3019AA3V750 cable tie mount	Reviewed
ETR98-0003	-	Tension and shear testing of click bond CB3019AA()V750 (ultem mount) and CB3019AA()N750 (nylon mount) cable tie mounts	Reviewed
PR034852-00-01	-	Test Plate Data Log KR TCA	Reviewed
NAVSEA Contract N00024-01-D7023	-	Torque test of CB9522CR10P16 Stud bonded to ½" steel plate with Click Bond CB200 Acrylic Adhesive 30 days no conditioning	

Electronic copies of the documents, appropriately stamped are available through the ABS Client Portal

Appendix

Description:

The following parts adhesively bonded with CB200 or CB420e REACH Compliant acrylic adhesive used for wiring, cable tray, junction boxes, piping, non-critical systems, etc

CS125 Stud, 1.25 (31,8 mm) Diameter Base of Material 316SS

CN125 Standoff, 1.25 (31,8 mm) Diameter Base of Material 316SS

CS200 Stud, 2.00 (58,8 mm) Diameter Base of Material 316SS

CN200 Stand-off, 2.00 (58, mm) Diameter Base of Material 316SS

CB9715 / CS915, Stud, Internally and Externally Fixtured, 2.38 (60,3) Diameter Base Material 316SS

CB9522 / CS922, Deck Stud, Self Fixturing, 2.63 (66,7 mm) Diameter Base of Material 316SS

CB3019 / CM319 Swivel Cable Tie Mount, 1.25 Diameter Aluminum Base

CB9120V5 / CM920VG5, Low Profile Cable Tie Anchor, .75 (19,1) x 1.13 (28,7) Base, PEI

CB9151V5 / CM951VG5, Cable Tie Anchor, Transverse Base .75 (19,1) x 1.13 (28,7) PEI Base

CB9205V / CM905, Loop, Strap Fastener, 3.25 (82,5) x 1 (25,4) PEI Base

CB4567V, Mount, Cable Tie, Double 1.10 (51,2) x .78 (19.79) PEI Base

CS120, Insulation Pin Mount 1-1/14" Diameter Base of Material CRES

CB9788 / CM988, Flush Tie-Down Ring, 2.63 (66,7) Diameter Base 316SS

CB9789 / CM989, Fixed Tie Down Ring, 2.0 (50,8) Diameter Base 316SS

Stauff Base Mount, CB4595 / CM459 (1A) 1.18" (30.0 mm) x 1.46" (37.0 mm) Stauff Base Mount, CB4595 / CM459 (2) 1.18" (30.0 mm) x 1.65" (42.0 mm)

Stauff Base Mount, CB4595 / CM459 (3) 1.18" (30.0 mm) x 1.97" (50.0 mm)

Stauff Base Mount, CB4595 / CM459 (4) 1.18" (30.0 mm) x 2.32" (59.0 mm)

Stauff Base Mount, CB4595 / CM459 (5) 1.18" (30.0 mm) x 2.90" (71.0 mm)

Stauff Base Mount, CB4595 / CM459 (6) 1.18" (30.0 mm) x 3.39" (86.0 mm)

Stauff Base Mount, CB4595 / CM459 (7) 1.18" (30.0 mm) x 4.76" (121.0 mm)

Stauff Base Mount, CB4595 / CM459 (8) 1.18" (30.0 mm) x 5.79" (147.0 mm)

Notes, Drawings, and Documentations:

Off-Shore Safety Factor, Off-Shore Safety Factor Strength Evaluation v4 DNV (Petrobras), Revision: -, Pages: 1

ETR97-0050 Tension Testing of Click Bond CB3019AA3V750 Cable Tie Mount, dated 18 November 1997. Pages: 2

ETR98-0003 Tension and Shear Testing of Click Bond CB3019AA()V750 (Ultem Mount) and CB3019AA()N750 (Nylon Mount) Cable Tie Mounts, dated 23 February 1998. Pages: 6

ETR03-041 Tensile, Peel, Modified Shear, and Shear Testing of Click Bond Adhesive Bonded Fastener Bonded to Shipboard Materials with AO420 Adhesive, PR2001 B-1/2 Sealant and RTV Sealant, dated 26 September 2003. Pages: 19

ETR03-057 Tensile Testing of CB9522CR10-10 Deckboard Mounting Studs Bonded with CB200 Adhesive to 3/8" inch Steel Plate Hot/Wet Conditioned for 30 days, dated 23 January 2006. Pages: 4

ETR08-022 Tensile Testing and 3" Modified Shear Testing of CS200-51618-16CR125 Studs Bonded with CB200 Adhesive to 1/2" Thick Steel Substrate, dated 13 June 2008. Pages: 5

ETR08-049 Tensile and Shear testing of CS200-3816-24CR studs and CS200-3816CR125 studs bonded with CB200 to aluminum, dated 13 June 2008. Pages: 5 ETR08-055 Shear testing and tensile testing of CB9522CR10P16 and CS200-3816-16CR studs bonded with CB200 adhesive to steel and aluminum substrates, dated 26 FEB 2009. Pages: 8

ETR10-027 AMERICAN BUREAU OF SHIPS (ABS) ADHESIVE BONDED FASTENER CERTIFICATION TEST, dated 13 August 2010. Pages: 24

ETR11-009 Tensile and offset shear testing of cast base cb9715 studs bonded with cb420 acrylic adhesive to bare steel after room temperature and hot/wet conditioning, dated 20 SEP 2011. Pages: 5

ETR12-013 Room and elevated temperature tensile testing of CB200-1213-16CR studs bonded with CB420 adhesive, dated 18 June 2012. Pages: 5

ETR15_008 Baseline testing of CB9788CRMP (CM988CRMP) flush tie down rings in tension and CB9789CRM5P (CM989CRM5P) fixed tie down rings in tension and lateral shear bonded

with CB200 and CB420 acrylic adhesives, dated 20 MAR 15, Pages: 16

ETR16-019 American Bureau of Ships (ABS) Adhesive Bonded Fastener Certification Test of CS450 Self-Fixturing Studs, dated 28 JUL 2016, Pages: 35

ETR16-031 Tensile and Offset Shear Testing of Cast Base CB9715/CS915 Studs Bonded with CB420 Acrylic Adhesive to Bare Steel After Room Temperature and Hot/Wet Conditioning, dated 16 AUG 2016, Pages: 5

ETR19_008, Qualification testing of CB420-50e two-part acrylic adhesive, dated 22MAY19, Pages: 82

ETR20_003 CB9715 and CS922 studs at temperature and salt fog testing, dated 28 February, 2020, Pages: 16

ETR20-008 Shear testing of CB9715CRM6-24P studs at room temperature and 140° F (60° C), dated 23 June 2020, Pages: 9

EPR-523 Data CB420 Lap Shear, Push-Out, and torque data, dated -, Pages: 6 EPR-569 Data CB420 Tension data with CB9715 stud, dated -, Pages: 5

NAVSEA Contract N00024-01-D7023 Torque test of CB9522CR10P16 Stud bonded to ¹/₂" steel plate with Click Bond CB200 Acrylic Adhesive 30 days no conditioning, dated -, Pages: 1

PR034852-00-01 Test Plate Data Log KR TCA, dated -, Pages: 1

SwRI Project No. 01.17789.02.026a, FTP Code Part 5 - Flame Spread Final Report (CB420-50 Adhesive), dated 31 January 2013, Pages: 11

SwRI Project No. 01.17789.02.026b, FTP Code Part 2 - Smoke and Toxicity Final Report (CB420-50 Adhesive), dated 15 February 2013, Pages: 10

Southwest Research Institute Fire Performance Evaluation in Accordance with Part 5 of Annex 1 IMO International Code for Application of Fire Test Procedures (2010 FTP Code) Test for Surface Flammability

CB200 Acrylic Adhesive Project No. 01.21604.16.313, January 22, 2016

Southwest Research Institute Fire Performance Evaluation in Accordance with Part 5 of Annex 1 IMO International Code for Application of Fire Test Procedures (2010 FTP Code) Test for Surface Flammability

CB420e Acrylic REACH Compliant Adhesive, Project No. 01.20689.01.610, March 20, 2015

Single Lap Shear of Click Bond CB200 Adhesive (per MIL-1312) Tested at 75°F and 250 °F Bonded to 7075-T6 Aluminum Substrate, dated 26 December 1996. Data From Salt water Fluid Immersion Test of CB9522 Studs Bonded with CB200 Adhesive, Report No. 9958 dated 11 September 2007.

CBPS-244 PROCESS SPECIFICATION



CBPS-244 PROCESS SPECIFICATION

CLICK BOND, INC. 21 CAGE CODE: 66530

2151 LOCKHEED WAY, CARSON CITY, NV, USA 89706-0713 PHONE: 775-885-8000

ADHESIVE BONDING CLICK BOND, INC. FASTENERS TO STEEL, ALUMINUM, CRES, AND COMPOSITE SUBSTRATES USING CB200 OR CB420E ACRYLIC ADHESIVES

1.0 <u>Scope</u>

This document establishes typical service loads and installation procedures for installing Click Bond adhesively bonded fasteners to steel, aluminum, corrosion resistant steel (CRES) and composite substrates using CB200 or CB420 acrylic adhesives.

2.0 Bonding process flow

- Step 1. Assemble Materials (Section 5.1)
- Step 2. Verify Conditions (Section 5.3)
- Step 3. Solvent Wipe Fastener Base (Section 7.0)
- Step 4. Solvent Clean and Abrade Substrate (Section 6.0)
- Step 5. Prepare Adhesive (Section 8.0)
- Step 6. Apply Adhesive and Install Fastener (Section 9.0)

The adhesive bonded fastener process flow is shown in Figure 4 (external fixture), Figures 5 and 6 (internal fixture). All personnel bonding fasteners must be trained to follow each installation procedure in detail.

BONDING SURFACES MUST BE CLEAN, AND OXIDES, SCALE, RUST, AND MOLD RELEASE MUST BE REMOVED BEFORE BONDING TAKES PLACE.



3.0 <u>Recommended Typical Loads</u>

The surface area of the Click Bond fastener base (bond surface), substrate material, its thickness and the adhesive selection are the defining factors which govern load carrying capacity. The application of Click Bond fasteners should consider the maximum applied loads and the number of fasteners and placement of those fasteners to support those applied loads. Tables 1 and 2 list Typical Service Loads based on applying the recommended adhesives and following the service restrictions defined in section 4.0.

Fastener	Base Dimensions in (mm)	Material	Ter lbs	nsion (Kg)	Sh lbs	near (Kg)	Momer in-lbs	nt Load (Nm)
CS125 and CN125	1.25 (31,8) Dia Base	316SS Base	75 * Note 3	(34,0) * Note 3	100 * Note 3	(45,4) * Note 3	25 * Note 3	(2,82) * Note 3
CS450	1.25 (31,8) Dia Base	316SS Stud & Base	75	(34,0)	100	(45,4)	25	(2,82)
CS200 and CN200	2.00 (50,8) Dia Base	316SS Base	100 * Note 1	(45,4) * Note 1	100 * Note 1	(45,4) * Note 1	50 * Note 2	(5,65) * Note 2
CB3019/CM319	1.25 (31,8) Dia Base	PEI Saddle	30	(13,6)	25	(11,3)	N	A
CB9120/CM920	.75 (19,1) x 1.13 (28,7) Base	PEI	50	(22,7)	75	(34,0)	N	A
CB9151/CM951	.75 (19,1) x 1.13 (28,7) Base	PEI	50	(22,7)	75	(34,0)	N	A
CB9205/CM905	3.25 (82,5) x 1 (25,4) Base	PEI	125	(56,7)	125	(56,7)	N	A
CB9715/CS915	2.38 (60,3) Dia Base	316SS Stud & Base	100 * Note 1	(45,4) * Note 1	100 * Note 1	(45,4) * Note 1	50 * Note 2	(5,65) * Note 2
CS120	1.20 (30,5) Dia Base	300 Series SS	25	(11,3)	25	(11,3)	N	A
CB9788/CM988	2.63 (66,7) Dia Base	316SS Base	100 * Note 1	(45,4) * Note 1	NA		Ν	A
CB9789/CM989	2.00 (50,8) Dia Base	316SS	100 * Note 1	(45,4) * Note 1	100 * Note 1	(45,4) * Note 1	Ν	A
CB4595 / CM459 1A	1.18 (30) x 1.42 (36) Base	316SS Base	60	(27,2)	40	(18,1)	N	A
CB4595 / CM459 2	1.18 (30) x 1.65 (42) Base	316SS Base	60	(27,2)	40	(18,1)	N	A
CB4595 / CM459 3	1.18 (30) x 1.93 (49) Base	316SS Base	60	(27,2)	40	(18,1)	Ν	A
CB4595 / CM459 4	1.18 (30) x 2.32 (59) Base	316SS Base	70	(31,8)	40	(18,1)	N	A
CB4595 / CM459 5	1.18 (30) x 2.76 (70) Base	316SS Base	80	(36,3)	40	(18,1)	N	A
CB4595 / CM459 6	1.18 (30) x 3.43 (87) Base	316SS Base	100	(45,4)	40	(18,1)	Ν	A
CB4595 / CM459 7	1.18 (30) x 4.75 (120,7) Base	316SS Base	100	(45,4)	40	(18,1)	N	A
CB4595 / CM459 8	1.18 (30) x 5.78 (146,8) Base	316SS Base	100	(45,4)	40	(18,1)	N	A

Table 1: Typical Service Loads for Click Bond Fasteners in Overhead and Bulkhead Applications*

*Loads are limited due to fire consideration, excessive temperatures. Maximum service temperature 140° F (60° C)

* NOTE 1: Limitation based on Fire Safety: 100 lbs (45 kg) Tension and Shear Limitation for Overhead Bulkhead Fastener with 2 inch base.

* NOTE 2: Limitation based on Fire Safety: 50 in-lbs (5,6 N-m) Moment Limitation for Overhead Bulkhead Fastener with 2 inch base.

* NOTE 3: Limitation based on Fire Safety: Not to be used above 6 feet (1,8 meters).

Table 2: Typical Service Loads for Click Bond Fasteners-Deck/Floor Applications (No Constant Load)*

Fastener	Base Dimensions in (mm)	Material	Teı lbs	nsion (Kg)	Sł lbs	near (Kg)	Momer in-lbs	nt Load (Nm)
CS200 and CN200	2.00 (50,8) Dia Base	316SS Base	176	(79,8)	176	(79,8)	185	(20,9)
CB9715/CS915	2.38 (60,3) Dia Base	316SS Stud & Base	1363	(618,2)	502	(227,7)	357	(40,3)
CB9522/CS922	2.63 (66,7) Dia Base	316SS Stud & Base	1461	(662,7)	690	(313,0)	N	A
CB9789/CM989	2.00 (50,8) Dia Base	316SS	533	(241,8)	603	(273,5)	N	A
CB9788/CM988	2.63 (66,7) Dia Base	316SS Base	669	(303,5)	١	NA	N	A

*Maximum Service Temperature 140 °F (60 °C).

FIGURE 1. TYPICAL SERVICE LOAD DIAGRAM FOR CS125 & CN125



4.0 Application and Service Restrictions

- 4.0.1 Maximum Service Temperature -40°F to 140°F (-40°C to 60°C). (For applications at temperatures above or below recommended range contact Click Bond.)
- 4.0.2 Structural thickness 1/8" (3 mm) or greater to achieve typical service loads. Consult a Click Bond outside sales reprensentative for applications where the substrate is thinner than 1/8" (3 mm).
- 4.0.3 All applied loads greater than 100 lbs. (45 kg) shall be restricted to a height no greater than 6 feet (1.8 meters) for bulkhead appplications. For overhead wire, cable and pipe runs that exceed 25 lbs (10 kg) per fastener, every 4th fastener in the span shall be a hard mount per fire safety restriction.

5.0 <u>REQUIREMENTS</u>

- 5.1 Materials, Solvents, PPE, Abrasive Media, and Tools
- 5.1.1 Adhesives (Refer to Adhesive SDS)
- 5.1.1.1 Pre-proportioned Adhesive Dispenser Cartridge Click Bond, Inc. Click Bond CB200-40 1 ea. 40-ml Dual Pack Cartridge (Accelerator and Adhesive) *Recommended for Galvanized Steel
- 5.1.1.2 Pre-proportioned Adhesive Dispenser Cartridge Click Bond, Inc. Click Bond CB420-50(E)

1 ea. 35-ml Dual Pack Cartridge (Accelerator and Adhesive) *Recommended for Carbon Steel, Stainless Steel, Aluminum, Fiberglass/Epoxy, and Carbon/Epoxy

5.1.2 Recommended Cleaning Solvents (Refer to solvent SDS)

5.1.2.1	CB911 Solvent Wipe	Click Bond, Inc.
5.1.2.2	Acetone, ASTM D329 General Specification	commercial
5.1.2.3	PolyChem® Surface Prep 4000 Pre-saturated Wipes	US Polychemical Co.

5.1.3 Gloves

•••••		
5.1.3.1	Nitrile Rubber Gloves	commercial
5.1.4	Miscellaneous (Abrasion/Material Requirements and Options)	
5.1.4.1	Aluminum Oxide Abrasive Paper (100-180 grit)	commercial
5.1.4.2	DHP120 (120 Grit Diamond Hand Pad)	C.R. Laurence Co./3M
5.1.4.3	Right Angle Grinder	commercial
5.1.4.4	Grinding Disc A24R	commercial
5.1.4.5	Fiber Disc 36 Grit	commercial
5.1.4.6	Slow Speed Pencil Grinder (User must order both items below for functional tool)	TFT-Pneumatic / ATEX
	Pencil Grinder Body (FG-2VX-50)	
	Pencil Grinder Rotating File (A-0005)	
5.1.4.7	Slow Speed Angle Grinder (User must order all items below for functional tool)	TFT-Pneumatic / ATEX
	Angle Grinder Tool (FCD-10X-52)	
	Grinding Disc (A-0500)	
	Angle Grinder Wheel Guard (A-0065)	
5.1.4.8	Clean, dry, lint free cloth (recommend cloth specified to AMS-3819)	commercial
E 0	Equipment	
5.2		
5.2.1	Adhesive Manual Dispensing Tool, CB100-81	Click Bond, Inc.
5.2.2	Static Mixer Dispensing Tip, CB106	Click Bond, Inc.
5.2.3	Axial Tensile Tester, CB609 (1-1/4" (31,8 mm) dia. base fasteners)	Click Bond, Inc.
5.2.4	Axial Tensile Tester, CB634 (2" (50,8 mm) or larger dia. base fasteners	e) Click Bond, Inc.
5.2.5	Deck Ring Proof Load Tester, CB656	Click Bond, Inc.

- 5.2.6Deck Ring Proof Load Tester, CB676Click Bond, Inc.
- 5.2.7 Adhesive Bond Strength Tester, CB670 (Used on CB9120 and CB9151) Click Bond, Inc.

5.3 Verify Conditions

- 5.3.1 Safety Follow all site safety requirements for working with solvents, adhesives, and power tools (if used). Follow all safety procedures for handling flammable solvents safely, especially when HOT WORK is occurring in the near vicinity. (Consult local safety regulations for clarification of procedures not defined in this process specification.)
- 5.3.2 Environmental Adhesive and surface bonding temperatures must be between
 32°F to 105°F (0°C to 41°C). Bonding surfaces must be dry; if in doubt and for surface sweating, follow paint requirements: bonding surface must be 5°F (2.8°C) above dew point.
- 5.3.3 Atmosphere The bonding surfaces must be CLEAN. If dust, particulates, spills, etc. contaminate the bonding surfaces after they have been cleaned, they must be re-cleaned before clean surfaces cannot be maintained, postpone bonding until conditions are suitable.
- 6.0 Surface Preparation (Ref. Figure 2)
- 6.1.1 General All surfaces to be bonded shall be clean and free of oil, dirt, and other foreign materials.
- 6.1.2 Abrading Remove all oxides. For metallic surfaces, acceptable surface condition shall be a bright rough appearance. For composites, remove all mold release and scuff/abrade the surface to remove the gloss. Caution: Do not abrade into the Composite fiber matrix.
- 6.1.3 Substrate Material Preparation
- 6.1.4 <u>Steel</u>
- 6.1.4.1.1 Solvent wipe substrate to remove surface contaminants.
- 6.1.4.1.2 Use recommended grinding wheel or pencil grinder (preferred) to remove all surface coatings and oxides to expose bare metal. Acceptable surface condition shall be a bright rough appearance (SP-11).
- 6.1.4.1.3 Solvent wipe abraded area with a CB911 wipe or other recommended solvents saturated cloth, using single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth) (Reference Figure 2).
- 6.1.4.2 Primed/Painted Steel Light Loads, 2 lbs. (1 kg), or less

(This alternate method may be used when testing has confirmed that the primer adhesion exhibits adequate strength to carry the loads supported by the installed fastener.)

- 6.1.4.2.1 Solvent wipe substrate to remove surface contaminants.
- 6.1.4.2.2 Lightly abrade the primed/painted surface with 120-180 grit Aluminum oxide to thin out and remove the gloss without removing the primer/paint.
- 6.1.4.2.3 Solvent wipe abraded area with a CB911 wipe or other recommended solvent saturated cloth, using single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth) (Reference Figure 2).
- 6.1.4.2.4 <u>Primed/Painted Steel Loads greater than 2 lbs. (1 kg)</u>
- 6.1.4.2.5 Solvent wipe substrate to remove surface contaminants.
- 6.1.4.2.6 Use recommended fiber disc or pencil grinder (preferred) to remove all surface coatings and oxides to bare metal. Acceptable surface condition shall be a bright rough appearance (SP-11).

- 6.1.4.2.7 Solvent wipe abraded area with a CB911 wipe or other recommended solvent saturated cloth using single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth) (Reference Figure 2).
- 6.1.4.3 Bare Aluminum
- 6.1.4.3.1 Solvent wipe substrate to remove surface contaminants.
- 6.1.4.3.2 Remove the oxide surface layer and any surface treatments or coatings, such as Alodine, by abrading with 120 grit aluminum oxide. Acceptable surface condition shall be a bright rough appearance (SP-11).
- 6.1.4.3.3 Solvent wipe abraded area with CB911 wipe or other recommended solvent saturated cloth, using a single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth) (Reference Figure 2).

6.1.4.4 Primed Aluminum – Light loads 2 lbs. (1 kg) or less

(This alternate method may be used when testing has confirmed that the primer adhesion exhibits adequate strength to carry the loads supported by the installed fastener.)

- 6.1.4.4.1 Solvent wipe substrate to remove surface contaminants.
- 6.1.4.4.2 Lightly abrade primed surfaces with 120-180 grit Aluminum oxide to thin out, but not remove, the primer.
- 6.1.4.4.3 Solvent wipe abraded area with CB911 wipe or other recommended solvent saturated cloth, using a single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth).
- 6.1.4.5 Primed Aluminum Loads greater than 2 lbs. (1 kg)
- 6.1.4.5.1 Solvent wipe substrate to remove surface contaminants.
- 6.1.4.5.2 Remove all surface coatings and oxides to expose bare metal with recommended fiber disc or pencil grinder (preferred). The acceptable surface condition is a bright metal appearance, SP-11.
- 6.1.4.5.3 Solvent wipe with a CB911 wipe or other recommended solvent saturated cloth using a single stroke motion while rolling wipe away from surface to remove abraded material. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth).
- 6.1.4.6 <u>Composite Material</u>
- 6.1.4.6.1 Solvent wipe substrate to remove any surface contaminants.
- 6.1.4.6.2 Abrade bare fiberglass/epoxy or carbon/epoxy laminates or other composites with 120-180 grit aluminum oxide abrasive paper to remove surface gloss and mold release from surface resin. Do not abrade into the glass fiber or carbon fiber matrix.
- 6.1.4.6.3 Solvent wipe abraded area with a CB911 wipe or other recommended solvent saturated cloth, using single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth) (Reference Figure 2).

6.1.4.6.4 Solvent wipe abraded area with a CB911 wipe or solvent saturated cloth, using single stroke motion while rolling wipe away from surface. Rotate wipe after each stroke to ensure a clean wipe surface. Immediately after solvent wiping, dry wipe with a clean cloth.





This area intentionally blank

7.0 <u>Fastener Surface Preparation</u>

- 7.0.1 Prepare only those fasteners that will be bonded at this time.
- 7.0.2 Wipe the base of the fastener using a CB911 wipe or other recommended solvent saturated clean wipe cloth. Immediately after solvent wiping, dry wipe with a clean cloth (recommend AMS-3819 wipe cloth).
- 7.0.3 Prevent fastener contamination by placing the fastener in a clean location until use.
- 8.0 Adhesive Mixing

FIGURE 3. ADHESIVE DISPENSING TOOLS



8.0.1 <u>Pre-proportioned Adhesive Dispenser Kit</u>

- 8.0.1.1 Insert the CB81 slide into the receiving end of the CB100 Manual Powered Dispenser as shown in Figure 4.
- 8.0.1.2 Remove back plate on cartridge and place the adhesive cartridge into the retaining slot of the tool and lock the cartridge in place with the retainer.
- 8.0.1.3 Before removing cap, mark cap and cartridge with a single vertical line. Marking the cap and cartridge will ensure proper realignment of the cap should it be replaced when removing the mixing tip.
- 8.0.1.4 Remove the endcap on the adhesive cartridge by turning the endcap counterclockwise. Retain endcap for later use (Figure 4).
- 8.0.1.5 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 adhesive materials by examining through the plastic bag and kneading the adhesive bag wall with your fingers. Both components should have an even consistency and be free of striations and lumps (Figure 4).

FIGURE 4. ADHESIVE CARTRIDGE PURGE AND MIXING TIP INSTALLATION PROCEDURE



- 8.0.1.6 Attach the static mixer dispensing tip to the end of the cartridge and secure the mixing tip by turning clockwise until the mixing tip stops (Figure 4).
- 8.0.1.7 Insert the end of the mixing tip into the plastic bag and actuate the tool until approximately one gram (approximately 2 inches (51mm)) of adhesive flows from the mixing tip (Figure 4).
- 8.0.1.8 Apply adhesive to the attachment part by dispensing from the mixing tip. The applicator dispenses the proper component ratio from the cartridge and the tip mixes the adhesive as it is dispensed.
- 8.0.1.9 To keep the adhesive from curing in the mixing tip, plan your work to ensure that at least one gram (approximately 2 inches (51 mm)) of adhesive is continually dispensed within a 3-minute time period. If necessary, dispense waste adhesive into the plastic bag for disposal. If adhesive cures in tip, replace mixing tip. Warning: Do not cut/shorten mixing tip to regain flow.
- 8.0.1.10 At the end of use, remove the mixing tip on 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 mixing tip. When ready to reuse the cartridge, remove the endcap, and repeat all steps of Section 8.0. Squeeze out a small portion of adhesive into a plastic bag to ensure the flow of both components. Attach a new mixing tip and proceed as in 8.0.1.5. Place the used mixing tip in the plastic bag with the waste adhesive for disposal. Any unmixed adhesive components in the bag may be mixed by kneading the bag. This will result in the eventual cure of the material and allow for disposal as a solid waste. (Alternately, leaving the mixing tip attached to the cartridge will preserve the unmixed adhesive for later use. Follow the cartridge purge instructions (8.0.1.5) to reattach a new mixing tip.)

- 9.0 Adhesive Application
- 9.0.1 **Externally Fixtured Fasteners**
- 9.0.1.1 Figure 4 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.

ГАВ	LE 3. BASEPLATE DIAMETER vs.	ADHESIVE SPOT DIAMETER (INCH	IES)
	BASEPLATE DIAMETER	ADHESIVE SPOT DIAMETER	
	in (mm)	in (mm)	
	1.25 (31,8)	.62 (15,7)	
	2.00 (50,8)	1.00 (25,4)	

Note: When bonding CB4595, CB9205, CB9120, CB9151 or other non-circular base parts, care should be taken to apply adhesive so a complete squeeze-out of adhesive is present around the perimeter of the baseplate when the part is installed per 9.0.2.6 or 10.1.2.

Follow installation procedures in Figure 4.

- 9.0.1.2 Solvent wipe the fastener base and wipe dry with a clean dry cloth. Remove the peel ply from foam tape pads and discard.
- 9.0.1.3 Apply a bead of adhesive to the center of the fastener baseplate. The quantity of adhesive applied should be sufficient to provide a squeeze-out of a small excess of adhesive completely around the edge of the baseplate. (Table 3 is offered for reference.)
- 9.0.1.4 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.
- 9.0.1.5 Press down lightly on the inner body of the fixture until it actuates. Caution: Do not press on the protruding fastener. Note: The clamping pressure of the fixture promotes an optimal bondline during the adhesive squeeze out and holds the fastener in place with positive pressure during the adhesive cure.
- 9.0.1.6 After the adhesive has cured, remove the fixture by grasping by hand or with pliers and pulling it off the substrate. Discard the fixture.

FIGURE 5. PROCEDURE FOR ATTACHMENT OF EXTERNALLY FIXTURED CLICK BOND FASTENER



CBPS-244 Rev. 7

9.0.2 Internally Fixtured Fasteners

- 9.0.2.1 Figures 6 and 7 show the sequential steps required to attach the fasteners supplied with internal fixture(s) that maintain pressure on the fastener baseplate while the adhesive cures.
- 9.0.2.2 Solvent wipe the fastener base, then wipe dry with a clean dry cloth.
- 9.0.2.3 Remove the peel ply from the centrally located tape disk or fixture tape and discard.
- 9.0.2.4 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.
- 9.0.2.5 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.
- 9.0.2.6 Verify adhesive coverage by observing a visible adhesive ring around the entire perimeter of fastener base.
- 9.0.2.7 Let cure. Caution: Do not disturb part until adhesive is cured.

FIGURE 6A. PROCEDURE FOR ATTACHMENT OF STANDARD INTERNALLY FIXTURED BULKHEAD CLICK BOND FASTENER (CB9715/CS915)



FIGURE 6B. PROCEDURE FOR ATTACHMENT OF STANDARD INTERNALLY FIXTURED FIXED TIE DOWN RING CLICK BOND FASTENER (CB9789/CM989)



FIGURE 6C. PROCEDURE FOR ATTACHMENT OF LARGE INTERNALLY FIXTURED CLICK BOND FASTENER (CB9522/CS922)



- 9.0.2.8 Figure 7 depicts an internally fixtured part combined with an external fixture for heavy installation applications to maintain installation pressure on the fastener baseplate while the adhesive cures.
- 9.0.2.9 Solvent wipe the fastener base and wipe dry with a clean dry cloth.
- 9.0.2.10 Remove the peel ply from the centrally located tape disk or fixture tape and discard.
- 9.0.2.11 Remove the peel ply from foam tape pads from external fixture and discard.
- 9.0.2.12 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 internal fixture tape or so close to the internal fixture that when installing the part, the adhesive is spread over the tape before it attaches to the substrate.
- 9.0.2.13 Locate the external 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.
- 9.0.2.14 Press down lightly on the inner body of the fixture until it actuates. Caution: Do not press on the protruding fastener. Note: The clamping pressure of the fixture promotes an optimal bondline during the adhesive squeeze out and holds the fastener in place with positive pressure during the adhesive cure.
- 9.0.2.15 Verify adhesive coverage by observing a visible adhesive ring around the entire perimeter of fastener base.
- 9.0.2.16 Let cure. Caution: Do not disturb part until adhesive is cured.
- 9.0.2.17 After the adhesive has cured, remove the external fixture by grasping by hand or with pliers and pulling it off the substrate. Discard the external fixture.

FIGURE 7. PROCEDURE FOR ATTACHMENT OF INTERNALLY FIXTURED CLICK BOND FASTENER WITH EXTERNAL FIXTURE SUPPORT



- 9.1 Adhesive Cure The approximate cure time to achieve handling strength for CB200 or CB420 at 75°F (24° C) is 2 hours. Full cure requires 24 hours at this temperature. Since the curing rate of the adhesive is sensitive to the ambient temperature at the application site, it is recommended that the surrounding adhesive bead be checked for firmness (hard to the touch) and tackiness (not sticky) before removing the external fixture.
- 9.2 Post Adhesive Cure All exposed substrate surfaces (steel, aluminum, or composite) where the finish was removed, may have that finished reapplied. Note: fastener/adhesive may be primed/painted. Ensure all contaminates and oxides are removed prior to surface touch-up.
- 9.3 In-Process Removal Procedure for Fasteners
- 9.3.1 Refer to CBPS-207 for the procedure to remove Click Bond fasteners.
- 9.3.2 If replacement of fastener is required after removing the fastener, remove remaining adhesive from substrate, and apply a new fastener in accordance with this specification.

10.0 QUALITY ASSURANCE PROVISIONS

- 10.1 <u>Visual Examination</u>
- 10.1.1 Visual examination of the adhesive components as they are dispensed from the pre-proportioned adhesive kits shall indicate that the material has not gelled, become hard, lumpy, or settled out. The consistency of the material shall be tested manually as described in Section 8.0.1.4 to ensure that it is suitable for application.
- 10.1.2 All exposed edges of bonded parts shall show a continuous adhesive bead squeeze-out along the fastener base perimeter surface.
- 10.1.3 Adhesive squeezed out of the joint shall be tested with a fingernail for cure.
- 10.1.4 The adhesive shall feel tough and offer resistance to penetration and shall not be tacky.

11.0 Adhesive Bond Verification Test

- 11.0.1 Following adhesive full cure (2 hours for ambient temperatures between 60°F 80°F and 4 hours between 45°F 60°F), bond strength can be verified by conducting a proof load test.
- 11.0.2 For CB9120 or CB9151 Cable Tie Anchors, proof load test by using CB670 tool per instructions shown on drawing.
- 11.0.3 For 1-1/4" (31,8 mm) diameter base fasteners, proof load test by using CB609 tool per instructions shown on drawing.
- 11.0.4 For CB9788/CM978 Flush Deck Ring or CB9789/CM989 Fixed Deck Ring, proof load test by using either CB656 or CB676 tool per instructions shown on drawing.
- 11.0.5 For 2" diameter or larger base fasteners, use a 3" (76,2 mm) diameter pipe with a 3/8" (9,53 mm) thick steel plate placed on top with a hole to allow for the stud thread to protrude, Figure 8. Place mating nut over the top and apply a torque load per the Table 4.

Fastener	Base Diameter in (mm)	Stud Thread Size	Torque Load in-Ibs. (Nm)
CS200		.250-20 or M6	43 (4,8)
	2 00 (50 9)	.312-18 or M8	53 (6,0)
	2.00 (50,6)	.375-16 or M10	64 (7,2)
		.500-13 or M12	85 (9,7)
CB9715 / CS915	2.38 (60,3)	.375-16 or M10	360 (40,67)
CB9522 / CS922	2.63 (66,7)	.625-11 or M16	1152 (130,2)

TABLE 4. PROOF LOAD TORQUE VALUES

FIGURE 8. PROCEDURE FOR PROOF LOADING BONDED STUD

