



THE GILL CORPORATION

HIGH PERFORMANCE COMPOSITE PRODUCTS SINCE 1945

The Gill Corporation
Instruction and Repair Manual
TGC IRM 9701 – Revision L

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Instructions for the Fabrication, Repair and Installation of The Gill Corporation Replacement Floor Panels in Airbus Aircraft

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1.1 Revision History

Revision	Date	Notes
E	2003-03-10	Revision history capture in 2020 started with this version as baseline. Sections shown are as existing in revision J.
F	2003-06-20	Add A318 referencing (section 2). Add insert types TF111 and TF110 (sections 8.1.3). Add insert manufacturer information for AEP and Shur-Lok (sections 8.1.3 and 8.1.4).
G	2008-05-27	Add BCC3 (4523) panel (section 3.4). Add information on non-slip floor coatings (section 7.2) and repair of panels (section 12). Remove datasheets for adhesives and edge fills from appendix [available on TGC website].
H	2017-12-14	Add T307 smaller diameter insert version of T303 for A320 family (section 8.1.4). Add new edge fill types and removal of one discontinued edge fill (sections 8.5.2 and 8.5.3). Add hardpoint T308 (section 11.10.10). Add A380 related usage (section 2). Update information for adhesive and edge fill vendors (sections 8.4 and 8.5). Insert drawings update (section 11.10). Capture name change from M.C. Gill to The Gill Corporation throughout.
I	2018-09-24	Addition of TF152 Torlon inserts for passenger floors of A320 family aircraft (section 8.1.2). Addition of multiple threaded inserts in passenger floors (section 8.3).
J	2020-08-31	Add threaded inserts for cargo panels and ABS1006 insert (section 8.3). Add no-insert and non-standard insert examples (sections 11.6 and 11.7). Add Revision History (section 1.1). Add re-use of serviceable parts (section 7.3). Overall formatting to improve reading the document.
K	2021-02-16	Corrected federal supplier code from 22459 to 22457 (section 5). Updated insert reference drawing for TF073/TF074 (section 11.10.1)
L	2021-07-07	Updated Section 3.4

2 Introduction

This manual contains instructions for the customers of The Gill Corporation for the installation and repair of replacement floor panels for passenger and cargo compartments of Airbus aircraft A300/B2/B4, A300-600, A310, A318, A319, A320, A321, A330, A340 and A380. The replacement passenger floor panels are qualified to Airbus Industrie Technical Specifications **5360 M1M 000600** and **TL53/5000/79**, and the cargo floor panels are qualified to **5360 M1M 000500**.

Complex floor panel configurations can be produced from the semi-finished, large sized sheet material using relatively inexpensive and readily available tools, equipment, adhesives, and edge filling compounds. Fabrication methods were designed for use in typical airline maintenance and repair facilities. To comply with Airbus specification and approval of the floor panels, only the materials specified and described in this manual may be used with The Gill Corporation products. Alternative components or combinations might not deliver the mechanical or flammability performance levels required by governmental airworthiness authorities and/or Airbus Industrie. In the event of any questionable or doubtful procedure or material, the applicable Airbus Aircraft Structural Repair Manual (SRM) is valid for the parts described in this manual.

To meet the various Airbus-specified geometric and physical property requirements for all aircraft types, several floor panel types are qualified and approved by Airbus. Panel identification and applications are summarized in [section 3.4](#). The panel configurations can be determined using the existing part as a template. This includes configurations such as the final shape, size, openings, and mounting holes of the existing part. When the original panel includes built in plugs for attachment points, potted holes or inserts can often be used instead. Some examples are provided in sections [11.6](#) and [11.7](#).

Because of the structural function of the floor panels, only relatively minor damage is allowed to be repaired. Extreme care must be exercised in determining whether damage is repairable or requires floor panel replacement. The Airbus Industrie SRM is the governing procedure, and the applicable SRM per [section 3.3](#) must be consulted for repair and replacement limits and procedures.

Attention: In order to maintain the original integrity and fire resistant properties in a repaired panel, only the methods and materials described in [Section 12](#) may be used to complete a repair.

Note: Cross-sections in this document are for illustration purposes and are not to scale.

Safety Precautions

Before using any of the chemical materials specified or recommended in this manual, the manufacturer's material safety data sheet for each product must be obtained and its safety practices observed. Safety Data sheets for the products used in this document can be found on The Gill Corporation website. In all cases, direct exposure by skin contact, inhalation, or ingestion must be avoided, at the very least requiring the use of eye protection and protective clothing. Good ventilation and lighting are essential. In areas where flammable solvents are in use, sources of ignition should be eliminated. Local safety requirements should be followed.

3 Applicable Specifications and Documents

3.1 Airbus Specifications

- AITS 5360 M1M 000500: Floor Panels – Cargo Compartments and Freighter Aircraft (convertible and full freighter). Made out of Large-Sized Plate Material.
- AITS 5360 M1M 000600: Carbon Floor Panels Made of Large-Sized Plate Material for Passenger and Flight Compartment Floor
- DBAA TL 53/5000/79: Glass Fibre Floor Panels for Passenger and Containerized Cargo Compartments Made out of Large-Sized Plate Material (Semi-Finished Product)

3.2 Reference Specifications

- FAR/JAR §25.853, §25.855, and §25.856(a): Passenger and Cargo or Baggage Compartments.
- FAR/JAR §25.857 and §25.856(a)(b): Cargo Compartment Classifications.
- FAR Part 25, Appendix F, Part III: Test Criteria and Procedures for Showing Compliance to §25.853 and §25.855.
- Airbus Industrie ABD 0031: Airbus Directive – Fireworthiness Requirements Pressurized Section of Fuselage

3.3 Airbus Structural Repair Manual Application by Aircraft

Aircraft	SRM
A300	53•21•00
A310/A300-600	53•10•20
A318/A319/A320/A321	53•02•00
A330/A340/A380	53•02•00

3.4 Application of The Gill Corporation Replacement Floor Panels in Airbus Aircraft

The Gill Corporation Floor Panel Designation	Airbus Industrie Panel Type	Airbus Industrie Technical Specification	Panel Application By Aircraft
Gillfab 4405, Types 1 and 2*	PC3	TL 53/5000/79	A300/A310
Gillfab 4123	MDC2	5360 M1M 000500	A300/A310/A300-600 Main Deck Cargo
Gillfab 4223	BCC2 BCCS6	5360 M1M 000500	A300/A310/A300-600 A318/A319/A320/A321 A330/A340 Bulk Cargo Compartments
Gillfab 4523	BCC3 BCCS8 BCCS8A	5360 M1M 000500	A300/A310/A300-600 A318/A319/A320/A321 A330/A340 Bulk Cargo Compartments
Gillfab 4522	CCC1 CCC2 CCCS3 CCCS3A	5360 M1M 000500	A300/A310/A300-600 A318/A319/A320/A321 A330/A340 Container Cargo Compartments
Gillfab 4505	PC3 PCE2/3 PCE4 PCE4A	5360 M1M 000600	A318/A319/A320/A321 A330/A340/A380 Passenger Compartment, Main Aisle and Galley
Gillfab 4605	PC1 PCE1	5360 M1M 000600	A318/A319/A320/A321 A330/A340/A380 Passenger Compartment, Seat Location

* Type 2 lower facing has an additional layer of aluminum for increased flammability resistance. Locations for panels Type 1 and 2 must correspond to the 'Airbus SRM.

4 Geometrical Requirements

The Gill Corporation replacement materials are available in sizes up to 1829 x 3658 mm (72 x 144 inches). Floor panels may be fabricated without consideration of the honeycomb core or facing orientation (ribbon versus transverse direction does not matter). This can help to optimize the usage of the panel when cutting out parts. However, face side versus back should be considered.

The geometry of the replacement panel may be duplicated from the applicable Airbus drawing, or by using the panel being replaced as a template. The fabricated replacement panel must be easy to install without causing damage to the panel or other structure.

5 Panel Identification – Marking

All panels supplied by The Gill Corporation will contain the following markings, resistant to liquids and detergents normally used in aircraft.

- The Gill Corporation name
- Federal supplier code for the manufacturer: 22457
- The Gill Corporation product designation
- Date of manufacture
- Batch number
- Identification of the upper side

Replacement part markings must also include information added by the part fabricator:

- Original Al part number and part number of the manufacturer
- Fabrication date of the finished floor panel

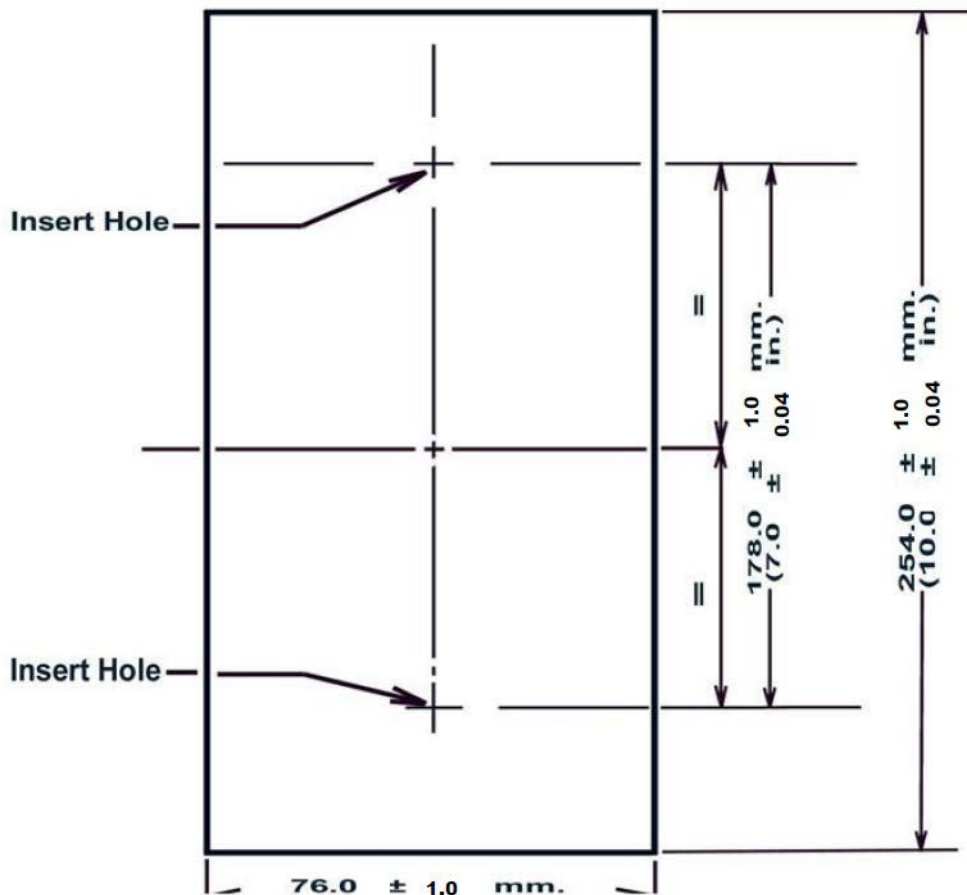
6 Insert Installation Approval

This manual describes the procedures for machining, drilling, and insert installation to prepare a panel for installation in the aircraft. The installation of inserts is very important for providing the mounting strength necessary to maintain the integrity of the airframe. First-time installers of inserts must demonstrate their ability by submitting prepared insert panel test specimens to The Gill Corporation for strength testing. If the test specimens meet the strength requirements then The Gill Corporation will provide the fabricator with a Certificate of Compliance.

The Gill Corporation can supply kits with test coupons and inserts for assembly into test specimens. For more information on the proper installation of inserts, please see sections [9](#) and [11](#). Supplementary instructional videos are also available on The Gill Corporation website.

6.1 Test Specimen Configuration – Insert Shear

AEP Molded Torlon Inserts, TF073, TF074 and TF152:	15 mm (19/32 or 0.590 in)
TYE Aluminum Inserts, TF20, TF21, T303 and T307:	11.1 mm (7/16 or 0.4375 in)
Shur-Lok Aluminum Inserts, TF110 and TF111:	12.7mm (1/2 or 0.500 in)



7 Floor Panel Fabricator Responsibility

The dimensions of the finished replacement floor panels must match those of the original parts. Panel types must comply with the applicable Airbus SRM. Panels must not be pieced together where a single panel section is required. As noted in [section 6](#), the panel fabricator must demonstrate the ability to install inserts properly by sending at least 6 test specimens to The Gill Corporation that meet the target values below, prior to preparing parts.

7.1 Typical Insert Shear Strengths

The following target values should be demonstrated by test:

- For panels Gillfab 4405 (Types 1 and 2), 4223, 4523, and 4522: 7560 N (1700 lbf)
- For panels Gillfab 4123, 4505, and 4605: 8007 N (1800 lbf)

All materials, machining, panel fabrication procedures, and test coupon preparation are described in the following sections.

7.2 Non-Slip Coating

Whenever applicable, the operator is responsible for the application of a non-slip coating using Airbus approved material so that the installed panel meets the requirements of FAR §25.793.

Note: See the Airbus Consumable Material List for suitable non-slip coating materials.

7.3 Re-Use of Serviceable Parts

Hardware or other parts attached to a floor panel being replaced can be re-used on The Gill Corporation panels. Re-used parts must remain in good condition, per the fabricator's discretion and in alignment with the Airbus SRM. Examples of serviceable parts can include:

- Insulation foams
- Connection Sheets
- Provisions (for entertainment systems or etc.)
- Other parts that remain in serviceable condition

8 Parts and Materials

The following sections describe the parts and materials approved for the use in the fabrication of The Gill Corporation replacement floor panels. The use of alternate articles from those shown below for panel preparation is not allowed unless specific permission such as an NTO (No Technical Objection) is obtained from Airbus Industrie. Equivalent performance of any alternatives must be demonstrated to the satisfaction of Airbus.

8.1 Inserts

8.1.1 Cargo Compartments: 2-Piece Torlon: TF073 and TF074

The Gill Corporation Replacement Panel	Airbus Industrie Panel Type	Insert Type	The Gill Corporation Insert Part Number
Gillfab 4523	BCC3	2-piece	TF073
Gillfab 4223	BCC2	2-piece	TF073
Gillfab 4522	CCC1	2-piece	TF074

TF073 and TF074 Insert Manufacturer

Marketing Masters
1871 NW Gilman Blvd, Suite 1
Issaquah, WA 98027

Phone: (425) 454-5610
Website: www.clipnuts.com

8.1.2 Passenger Compartment A320 Family Only: 2-Piece Torlon: TF152

The Gill Corporation Replacement Panel	Airbus Industrie Panel Type	Insert Type	The Gill Corporation Insert Part Number
Gillfab 4505	PC3	2-piece	TF152A Plug
Gillfab 4605	PC1		TF152B Sleeve T152 Assembly

TF152 Insert Manufacturer

Marketing Masters
1871 NW Gilman Blvd, Suite 1
Issaquah, WA 98027

Phone: (425) 454-5610
Website: www.clipnuts.com

8.1.3 Cargo Compartments: 1-Piece Aluminum: TF20, TF21, TF110 and TF111

The Gill Corporation Replacement Panel	Airbus Industrie Panel Type	Insert Type	The Gill Corporation Insert Part Number
Gillfab 4522	CCC1	1-piece	TF111
Gillfab 4523	BCC3	1-piece	TF110 or TF20
Gillfab 4223	BCC2	1-piece	TF110 or TF20
Gillfab 4123	MDC2	1-piece	TF21

TF110 and TF111 Insert Manufacturer

Shur-Lok Corporation
 2541 White Road
 Irvine, CA 92614

Phone: (949) 474-6000
 Website: www.shur-lok.com

TF20 and TF21 Insert Manufacturer

The Young Engineers, Inc.
 25841 Commercentre Drive
 P.O. Box 278
 Lake Forest, CA 92630-0278

Phone: (949) 581-9411
 Website: www.youngengineers.com

8.1.4 Cargo and Passenger Compartments: 2-Piece Aluminum: T303 and T307

The Gill Corporation Replacement Panel	Airbus Industrie Panel Type	Insert Type	The Gill Corporation Insert Part Number
Gillfab 4405, Types 1 and 2 Gillfab 4522 Gillfab 4505 Gillfab 4605	PC3, TY 1 and 2 CCC1 PC3 PC1	2-piece	All Aircraft: T303A Plug T303B Sleeve T303 Assembly A320 Family: T307A Plug T307B Sleeve T307 Assembly

T303 and T307 Insert Manufacturer

The Young Engineers, Inc.
25841 Commercentre Drive
P.O. Box 278
Lake Forest, CA 92630-0278

Phone: (949) 581-9411
Website: www.youngengineers.com

8.2 Special Design Criteria: Hardpoint Attachments: T304, T306, T305 and T308

For the installation of lower galley, lavatory, and attendant seat attachment points, specially designed inserts must be installed if the original floor panel contains the hardpoint holes. The inserts consist of three different types which depend on the unit to be attached and must correspond to the parts being replaced. The insert types are 2-piece constructions of aluminum and are described below.

Airbus Industrie Hardpoint Insert Type	Manufacturer's Part Number			The Gill Corporation Insert Part Number
	Plug	Sleeve	Assembly	
1	TYEP5330A1	TYES5330A1-380	TYE5330A1-380	T304
2	TYEP5331A2	TYES5331A2-380	TYE5331A2-380	T306
3	TYEP5332A2	TYES5332A2-380	TYE5332A2-380	T305
4	TYEP5330A2	TYES5330A1-380	TYE5330A2-380	T308

Hardpoint Insert Manufacturer

The Young Engineers, Inc.
25841 Commercentre Drive
P.O. Box 278
Lake Forest, CA 92630-0278

Phone: (949) 581-9411
Website: www.youngengineers.com

8.3 Threaded Inserts

All Gill Corporation Panels shown here have been approved with these threaded inserts. The inserts should be installed according to their instructions in [section 11.5](#). Choose the appropriate threaded insert according to the applicable Airbus drawing or removed part in order to correctly integrate with the surrounding structure. Base numbers of the inserts are listed below. The exact depths used should be chosen to match the application. Hardware manufactures for these threaded inserts are not listed, as Airbus approved materials should be used per the appropriate Standard Manual.

The Gill Corporation Replacement Panel	Airbus Industrie Panel Type	Threaded Insert Part Number
Gillfab 4405, Types 1 and 2	PC3, TY 1 and 2	NAS 1833-3
Gillfab 4123	MDC2	NAS 1834 C3K
Gillfab 4223	BCC2	NAS1835
Gillfab 4523	BCC3	NAS 1836-3
Gillfab 4522	CCC1	DAN401-3
Gillfab 4505	PC3	ABS1006
Gillfab 4605	PC1	

8.4 Adhesives

The following two-part epoxy adhesives are for potting inserts into floor panels. The potting procedure is necessary to ensure that the required pullout strengths are achieved. Only those materials described below may be used for the fabrication of The Gill Corporation replacement floor panels unless approval for an alternate material is issued by Airbus Industrie or by test in association with The Gill Corporation.

The adhesive potting materials describe below are available from the manufacturers or distributors in a variety of packages, ranging from bulk containers to pre-measured cartridges. The use of adhesives for installation is detailed in [section 11](#). The procedure used will depend on the availability and practice of the replacement panel fabricator.

8.4.1 Loctite®Hysol® EA9309.3NA

Loctite®Hysol® Manufacturer:
Henkel Loctite Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Phone: (800) 562-8483
Website: www.loctiteproducts.com

8.4.2 Epibond 420 A/B

Epibond Manufacturer:
Huntsman Advanced Materials
5121 San Fernando Road West
Los Angeles, California 90039-1011

Phone: (818) 247-6210
Customer Service: (888) 564-9318
Website: www.huntsman.com

8.5 Edge Filling Compounds

The edge filling compounds are two-part epoxy systems used around the edges of panels. The edge filling provides protection and support of the panel edges, and also prevents moisture from entering into the honeycomb core. Detailed instructions for application of edge fill is described in [section 10](#).

8.5.1 Alexit® FST 495-14

Alexit Manufacturer:

German Office:
Mankiewicz Gebr. and Co (GmbH Co.)
George-Wilhelm Strasse 189
D-21107 Hamburg (Wilhelmsburg)
Germany

Phone: +49 (40) 75 10 30
Website: www.mankiewicz.com

US Office:
Mankiewicz Coatings L.L.C.
1200 Charleston Regional Parkway
Charleston, South Carolina 29492

Phone: (843) 654-7755
Website: www.mankiewicz.com/english

8.5.2 Scotch-Weld EC3524 B/A

Scotch-Weld Manufacturer:

US Office:
3M Corporate Headquarters
3M Center
St. Paul, Minnesota 55144-1000

Phone: (888) 364-3577
Website: www.3m.com

8.5.3 Scotch-Weld 3550 B/A FST

Scotch-Weld Manufacturer:

US Office:
3M Corporate Headquarters
3M Center
St. Paul, Minnesota 55144-1000

Phone: (888) 364-3577
Website: www.3m.com

9 Machining The Gill Corporation Composite Products

This section contains recommendations for cutting, drilling, and routing of flooring sandwich panels. The information can be useful for the fabrication of the semi-finished material into exact replacement articles. Fabricators can select different tools and techniques as long as the resulting quality remains high. Techniques ranging from hand work to CNC machining can all be successfully used with appropriate care.

The sandwich panels are composed of fiberglass or carbon fiber reinforced/phenolic resin facings bonded to Nomex/phenolic resin honeycomb core. Care must be taken in the fabrication of replacement panels to avoid disbonding, delamination, tearing, burning, fuzzing of the fiber, or crushing of the core.

9.1 Drilling

9.1.1 Tooling Recommendations for Drilling

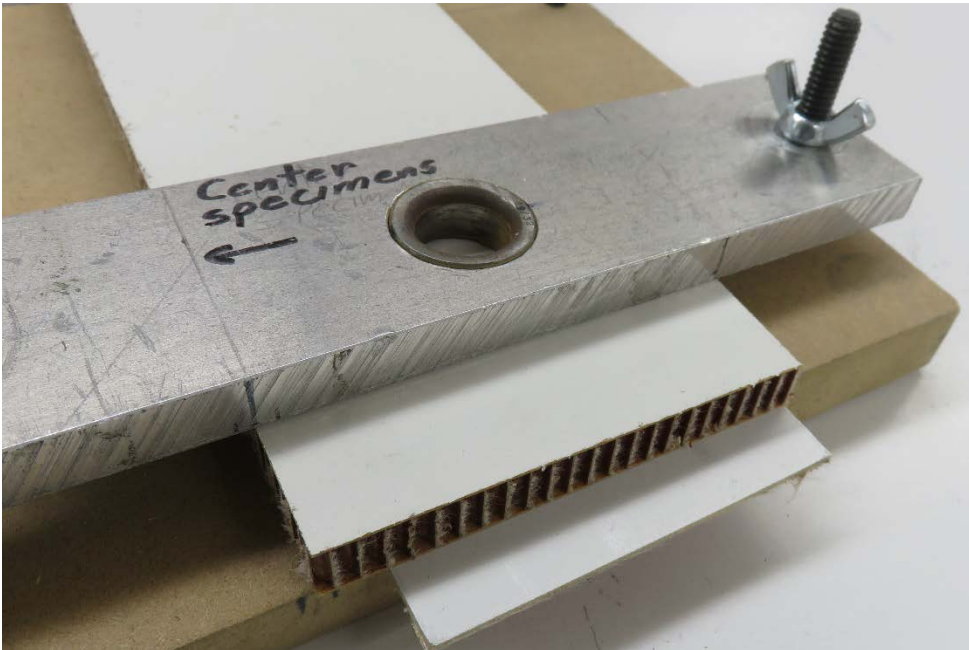
Drill Type	Information
High Speed Steel	<ul style="list-style-type: none"> - Lowest initial cost, readily available. - Short drill life, especially in fiberglass. - About 500 holes in fiberglass between sharpening. - Improved with a hard flash of chrome plating (0.003" - 0.005") is put on the drill bit. - Flash chrome is recommended for large drills where carbide is too expensive.
Tungsten Carbide	<ul style="list-style-type: none"> - Higher initial cost but longer life. May be re-sharpened. - Up to 3/16" diameter, grind drill to have a slight negative rake on the cutting tip. - Over 3/16" diameter, use slow helix drill, ground to 55° point (sharp). - Recommended for high production requirements only.
Diamond-Grit Edged Drills	<ul style="list-style-type: none"> - For fiberglass only. Most expensive, but longest lasting, fastest and smoothest cutting. - Recommended for high volume only. - May be recoated at near initial cost, 40 grit recommended for most Gill fiberglass products. - 10,000 surface feet per minute is customarily available on 10,000-20,000 rpm router. - Will drill a hole 3 times as fast as a carbide drill. - Dust collection system mandatory. - Cannot be used with drill bushings or slip-renewables.
Fiberglass Drill/Router	<ul style="list-style-type: none"> - Solid carbide, fairly expensive. - Must be returned to manufacturer for sharpening. - Produces clean fuzz-free holes in most fiberglass without delamination, especially in thin (less than 0.060") fiberglass. - Cuts quickly without tearing, delaminating, or fuzzing the fibers around the hole.

9.1.2 Drilling Template with Bushings

For work requiring center to center hole tolerance of ± 0.03 inches (0.8 mm) or less, the use of a drill template with hardened steel bushings is recommended. Good tooling will speed production and provide accurate repeatability of the hole pattern. For small jobs (less than 15 holes) a removable bushing (slip renewable) may be used. It is not as accurate as pressed bushings, but the tooling cost is reduced.

For holes requiring close tolerance diameters ± 0.005 inches (0.13 mm) or less, a pilot hole should first be drilled through a bushing, then the hole counterbored to the final diameter. Sandwich panels with honeycomb cores should also be back-drilled (counterbored through the back skin) since the pilot hole in soft cores will not hold the counterbore pilot steady. Drilling a hole without a bushing may produce egg-shaped holes since most drill chucks do not turn in a perfectly circular path, and the operator cannot hold the drill at a perfect 90° angle to the work piece. Using a drill press or a portable drill guide will simplify drilling holes at 90° to the material surface. Whenever possible, many facilities drill holes slightly larger than they are actually needed in order to eliminate the need for tooling and drill bushing.

It can also be useful to place an extra layer of undrilled cardboard, chip board, or excess laminate beneath the bottom layer being drilled. This helps prevent fuzzing on the last layer.



9.2 Cutting and Routing

9.2.1 Tooling Recommendations for Cutting and Routing

Method	Information
Band Saws	<ul style="list-style-type: none"> - Not recommended, slow cut, difficult to control, but can be used for rough cut on loose tolerances. - Will dull rapidly, but gives a fair cut even when dull and is inexpensive to replace. - Fence should be used to control the cut as much as possible - Most The Gill Corporation products may be cut with a standard 8-10 tooth/inch band saw.
Circular Saw	<ul style="list-style-type: none"> - Typically, 12" to 16" diameter carbide tipped or diamond saw blades are used. - Diamond blades are coated 40 grit. - Extra care must be taken to ensure that the laminates do not delaminate or singe. - For worker comfort and general good housekeeping, a good vacuum system for dust collection is a must. - Recommended blade speeds are shown in the table below
Shearing (Laminates Only)	<ul style="list-style-type: none"> - Laminates can be cut with a mechanical shear, available in many maintenance shops. - For the thickest laminates, a heavy-duty, sharp blade shear is required to prevent delamination or tearing - The thinner laminates (0.025" and below) can be cut by means of heavy-duty handheld scissors. - Extra care must be taken to tearing, delamination, or fuzzing of the fibers. - Reduces the amount of dust generated.
Routing	<p><u>Recommended Router Bits are as followed:</u></p> <p>Fiberglass Router – Best, inexpensive, can be sharpened. Best with rigid laminates.</p> <p>Diamond Grit – Will cut and clog; longest life; can be cleaned.</p> <p>Carbide Tip – Dulls rapidly, not recommended.</p> <p>Burr Mill – Best when performing CNC routing</p>

Circular Saw Recommended Blade Speeds

Blade Diameter	Revolutions per Minute	Surface Feet per Minute
8	4500	9400
10	4000	10500
12	3600	11300
16	3450	14500

9.3 Deburring

All machined and cut edges of the panel must be deburred to remove fibers exposed during machining operations to ensure a clean, debris-free surface for subsequent bonding or edge filling procedures.

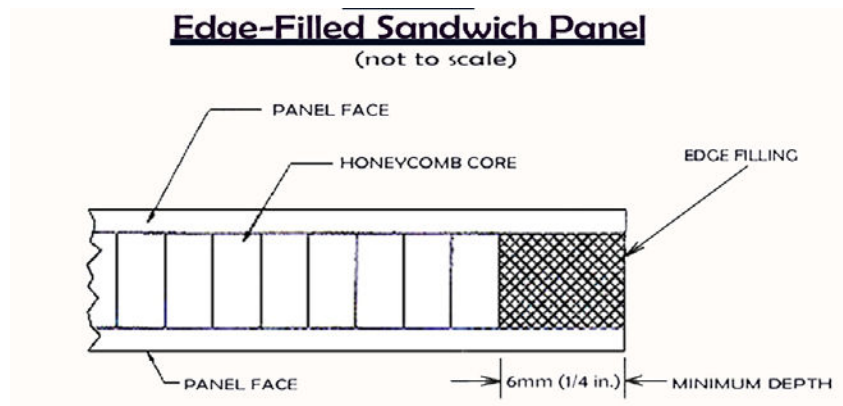
10 Edge Filling Procedure

Replacement flooring panels must be edge-filled. Edge fill protects and supports the panel edges and prevents moisture incursion into the honeycomb core. Only edge fills listed in [section 8.5](#) are approved for use with The Gill Corporation panel applications described in this manual. The Gill Corporation must issue permission for alternate material use.

10.1 Instructions for Edge Filling

Step	Reference	Instruction
1	9.2 & 10.3 step 1	Remove a minimum of 0.24 inches (6 mm) of honeycomb core from the panel edge. A depth controlling tool can be attached to the router to maintain 0.24 inches. Do not cut into or thin the panel skins.
2	-	Remove dust and debris to ensure optimal bonding.
Note: Follow edge fill manufacturer instructions for mixing two-part materials. Look for uniform color free of streaks or blotches. Do not mix more than can be used within the limited working life of the material.		
3	10.3 step 3	Spread edge fill putty into the panel edge with a spatula or putty knife. Fill the honeycomb as completely as possible. Panel edges and any cut-out exposed edges must be filled.
4	-	Remove excess edge fill with the spatula, smoothing material flush with the panel edges.
5	-	The edge fill will cure at room temperature in 24 to 48 hours. If a shorter cure time is needed, follow manufacturer's instructions for accelerated cure. 12 hours at room temperature should allow inspection and sanding.
6	10.3 step 4	Verify that all edges are filled, and the quality of work. If needed, edges can be lightly sanded to smooth.

10.2 Cross-Section of Edge Filled Sandwich Panel



10.3 Illustrations of Edge Filling Procedure

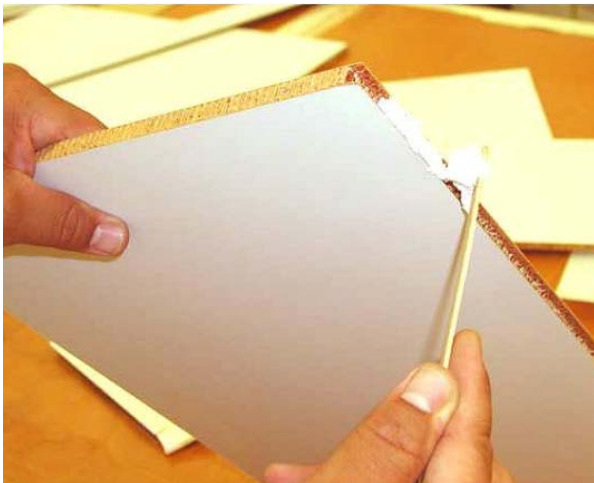
Step 1: Rout panel edges to a depth of 6 mm. A high speed rotary tool is shown. Be careful not to remove any facing material – only the core.



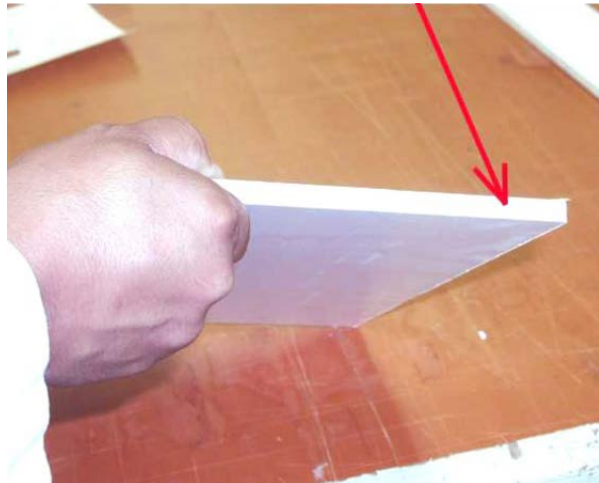
Step 2: Thoroughly mix two-part edge fill material according to the manufacturer's instructions. The resulting mix should be uniform in color, and have the consistency of putty.



Step 3: Apply edge fill and around all edges of the panel. Smooth with a trowel or spatula before it hardens. Mix only enough for 30 – 40 minutes.



Step 4: Edge filling should be smooth and flush with the edges of the panel.



11 Insert Installation

Inserts offer a reinforced attachment of floor panels to the aircraft structure, for stress transfer to the airframe. Strength to resist pullout and shear failure is created by bonding the insert flange to the panel facing and potting the insert into the panel with adhesive. Potting is especially important for pullout strength. Potting also offers a barrier to fluid penetration. Follow insert procedures carefully and use only the materials specified. The Gill Corporation must issue permission for alternate material use.

Keep all bonding areas clean and free of contamination, including oil, grease, water, dust, fingerprints, etc. Commonly available solvents such as acetone or isopropyl alcohol may be used for cleaning, as long as all surfaces are allowed to dry prior to bonding.

Photos illustrating processes of installing inserts show test specimen coupons. The same techniques are used for full-sized parts. Cut panels to their finished size and apply edge fill before installing inserts.

Caution: Commonly used solvents are flammable and potentially harmful if inhaled. Follow manufacturer's recommendations from Safety Data Sheets when handling any materials.

11.1 Instructions for Panel Preparation

The following steps describe the preparation of the panel for all insert types. Take care not to damage the panel facings or inserts during handling and machining. Refer to [section 9](#) for machining recommendations.

Step	Reference	Instruction
1	11.2 step 1	Mark the locations of all holes to be drilled.
2	11.2 step 2	Drill holes. Take care not to cause excessive fuzzing or fiber damage. Keep the drill bit as perpendicular as possible to the panel surface. Ensure holes drilled are free of debris and loose material prior to bonding. Thin-nose pliers may be used to remove loose particles. A stream of clean, dry compressed air can be used to remove dust.
3	11.2 step 3 and 4	Remove 3 to 5 mm (1/8 to 3/16 inches) of the honeycomb core between the facings. For hand work, use a high speed rotary tool (Dremel® or equivalent). See photo for a hole with enough honeycomb core removed.
4	-	Ensure that debris and dust is removed from the hole.
5	11.2 step 5	Lightly sand the lower facing of the panel where the insert flange will be bonded with sandpaper or emery cloth. Wipe away any dust with a clean, dry cloth to remove debris. For non-symmetric panels, the lower facing is thinner.
6	11.2 step 6	Clean insert parts by immersion or wiping with acetone (or equivalent solvent).
7	-	Allow inserts to dry.

11.2 Illustrations of Panel Preparation

Step 1: Mark locations for drilling 38mm (1.5 inch) from each end of the test specimen. For replacement parts, SRM drawings or the existing panel determine where to drill.



Step 2: Drill holes of the needed size in desired locations. Ensure holes are perpendicular to the panel surface.



Note: Step 3 is very important. The routed out cavity must be large enough to provide structural integrity to the bonded insert. Do not remove or damage skins.

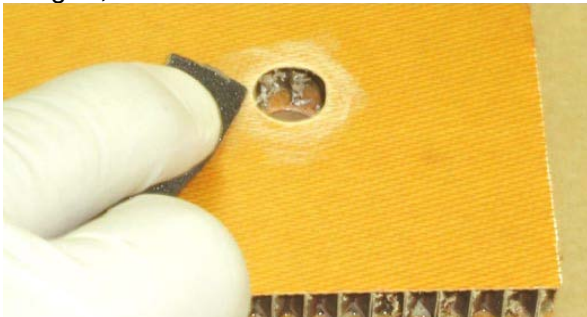
Step 3: Rout core to undercut 3-5mm (1/8-3/16 inch) or about one cell. A high speed rotary tool is shown.



Step 4: Check amount of core removed and quality of hole. Depth shown is about 4mm (5/32 inch)



Step 5: Lightly sand facing in the area of the insert flange. For inserts where both sides are flanged, sand both sides.



Step 6: Degrease inserts by immersion in clean solvent. Acetone is recommended.



11.3 Insert Installation Details

Subsequent sections describe installation of different inserts, with illustrations for demonstration purposes. For all insert types, ensure that you are using the correct insert for the type of panel, [per section 8.1](#). Determine whether to use the injection or spatula method for potting the insert before starting, and ensure all necessary equipment is available. If injecting, determine whether adhesive pre-mixing is required. The approximate weight of the installed, potted insert is 4.5 – 5.5 grams (0.010 – 0.012 lbs).

Note: Whenever potting material cannot be injected through a hole in the bottom insert, adhesive must be applied using the spatula (without injection) method.

11.3.1 2-Piece Torlon® Inserts for Cargo Floors: TF073 and TF074

Note: Use a drill diameter of 15mm (19/52 or 0.590 inches) for these inserts.

TF073 and TF074 inserts described in [section 8.1.1](#), and shown in [section 11.10.1](#) provide a flush-mounted installation in the upper surface. This will leave the insert level with the top face of the floor panel.

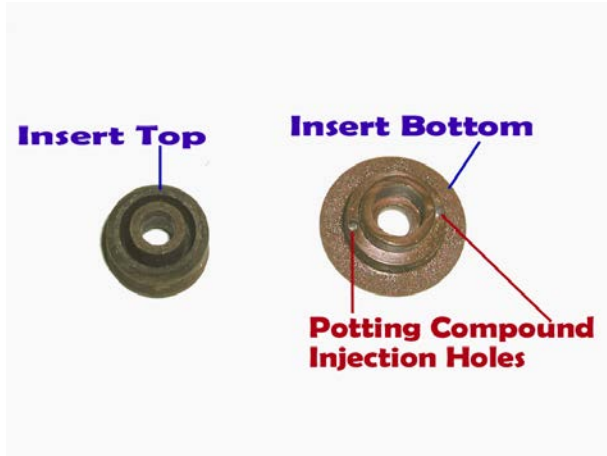
11.3.1.1 Instructions for Adhesive Injection

Adhesive injection is a faster and more uniform technique for installation, preferred by most customers. Instructions when using the injection method for potting are:

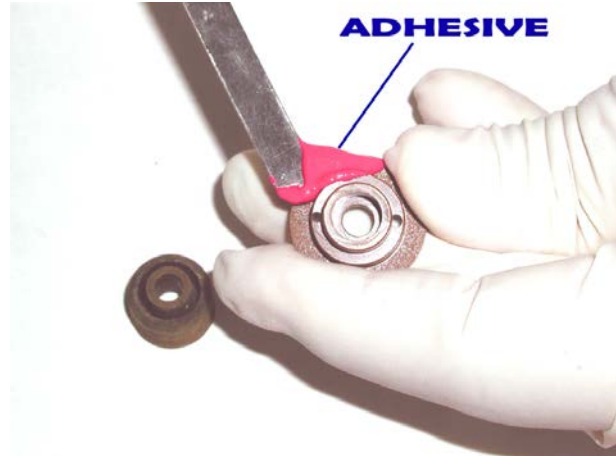
Step	Reference	Instruction
1	11.1 & 11.2	Prepare panels, inserts and holes and adhesive as previously described
2	-	If needed, pre-mix adhesive per manufacturer's instructions. A: When using a two-cartridge adhesive package, a hand-operated dispensing gun and mixing nozzle can inject adhesive through the potting holes. Pre-weighing is not necessary B: When using a hand-operated syringe or air-pressure operated gun, adhesive must be pre-mixed and loaded into the applicator.
Note: An applicator diameter of approximately 1.8mm (0.072 inch) is recommended for either injection technique. If using a different diameter, make sure the tip fits into the insert hole to allow proper encapsulation. This will avoid wasting adhesive and difficult cleanup.		
3	11.3.1.2 step 2	Apply adhesive to the flange of the insert sleeve (bottom) before installing in the panel. Do not place adhesive inside the panel.
4	11.3.1.2 step 3	Place the insert sleeve with flange into the lower face (the thinner face for non-symmetric panels)
5	11.3.1.2 step 4	Place the plug into the upper face
6	-	Align the plug and sleeve so that they can be pressed together without damage
7	11.3.1.2 step 5 or 6	Press the insert sections together with an arbor press or hammer. Use only enough pressure to make the insert plug flush with the panel surface and seat the insert flange to the back of the panel.
8	-	Verify that only a small quantity of adhesive squeezed out from underneath the flange, so that enough adhesive remains to provide an adequate bond to the panel.
9	11.3.1.3	Put the mixing nozzle into one of the 2.3mm (0.092 inch) insert holes and inject adhesive until it flows out the opposite hole and no air bubbles come out. Wait a minute for more air, then inject more adhesive into the opposite hole.
10	11.3.1.3	Remove excess adhesive from upper and lower facings using a dry cloth. If necessary, a slight amount of solvent can be added to the cloth in order to help. Do not apply solvent directly to the panel.
11	-	Use a cotton swab to remove adhesive in the hole through the insert.
12	-	Inspect that the insert seated properly, the flange is not broken, the insert hole is clear and the panel is reasonably clean.
13	-	Allow the panel to cure at room temperature or use accelerated temperature, per manufacturer's instructions, so that the adhesive develops adequate strength prior to use. Typical cure times are 3-5 days at 23°C (73°F) or 2 hours at 60°C (140°F). Do not exceed 82°C (180°F).

11.3.1.2 Illustrations of Insert Installation

Step 1: Cleaned 2-piece Torlon® insert



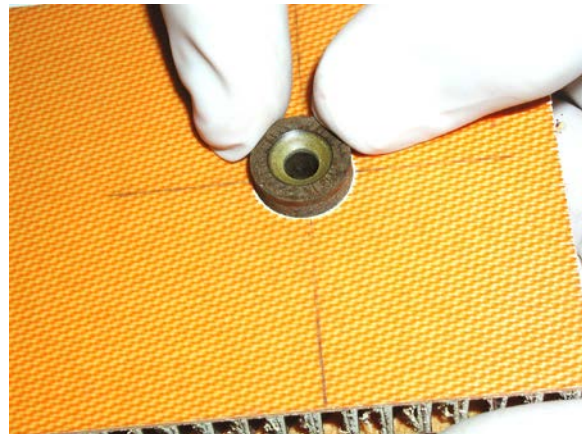
Step 2: Apply adhesive to the inside of the flange.



Step 3: Install insert sleeve (with adhesive on flange) in lower facing.



Step 4: Install plug in upper facing. Align pieces to prevent breakage when parts are sealed.



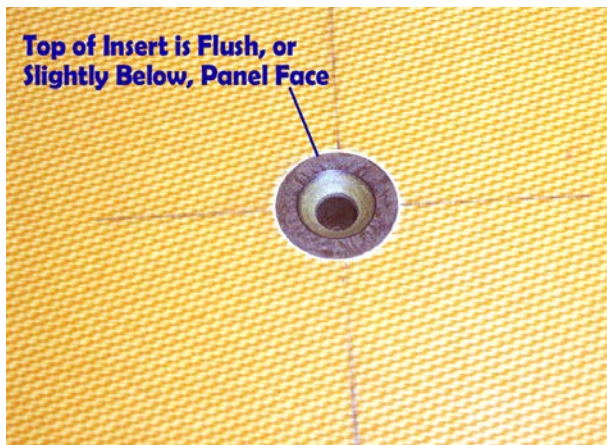
Step 5: Use an arbor press to seat the insert. Use only enough pressure to mount the insert plug flush with panel surface



Step 6: If an arbor press is not available, place panel/insert assembly on a firm base, and tap insert plug gently with a hammer until it is flush with panel surface.



Step 7: Insert must be flush with panel surface; remove any adhesive which might have squeezed out from around insert plug.



11.3.1.3 Illustration of Adhesive Injection

Method 1: Injection using a hand operated cartridge gun. Pre-packaged adhesive cartridge does not require pre-weighing.



Method 2: Injection using an air-operated gun. Pre-weigh and mix adhesive before adding to the reservoir.



Method 3: Injection using a hand operated syringe. Pre-weigh and mix adhesive before adding to the syringe barrel.



All Methods: Remove excess adhesive. Insert flange should be seated firmly against lower face. Ensure that flange is not broken.



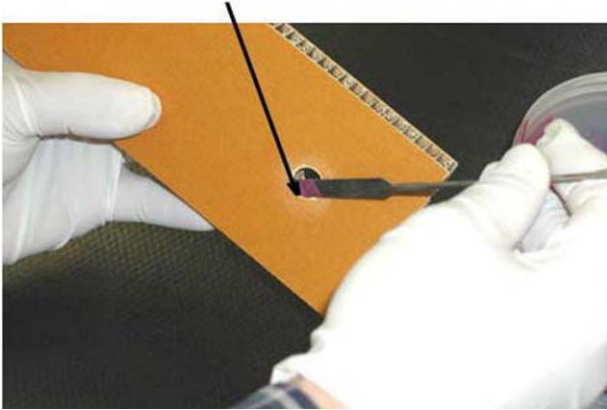
11.3.1.4 Instructions for Spatula Method

When using the without injection spatula method for potting, follow these instructions:

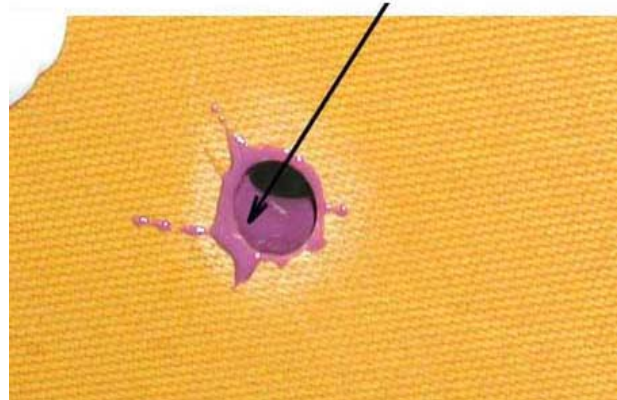
Step	Reference	Instruction
1	11.1 & 11.2	Prepare panels, inserts and holes as previously described
2	-	Mix adhesive per manufacturer's instructions. Make only the amount that can be used in 30-40 minutes.
3	11.3.1.5 step 1	Apply adhesive with a small spatula or trowel to the routed out areas of the panel.
4	11.3.1.5 step 2	Check that there is sufficient adhesive applied in the panel to encapsulate the installed insert completely.
4	11.3.1.2 step 2	Apply adhesive to the flange of the insert sleeve (bottom) before installing in the panel.
5	11.3.1.2 step 3	Place the insert sleeve with flange into the lower face (the thinner face for non-symmetric panels)
6	11.3.1.2 step 4	Place the plug into the upper face
7	-	Align the plug and sleeve so that they can be pressed together without damage
8	11.3.1.2 step 5 or 6	Press the insert sections together with an arbor press or hammer. Use only enough pressure to make the insert plug flush with the panel surface and seat the insert flange to the back of the panel.
9	-	Verify that only a small quantity of adhesive squeezed out from underneath the flange, so that enough adhesive remains to provide an adequate bond to the panel.
10	11.3.1.3	Remove excess adhesive from upper and lower facings using a dry cloth. If necessary, a slight amount of solvent can be added to the cloth in order to help. Do not apply solvent directly to the panel.
11	-	Use a cotton swab to remove adhesive in the hole through the insert.
12	-	Allow the panel to cure at room temperature, or use accelerated temperature, per manufacturer's instructions, so that the adhesive develops adequate strength prior to use. Typical cure times are 3-5 days at 23°C (73°F) or 2 hours at 60°C (140°F). Do not exceed 82°C (180°F).

11.3.1.5 Illustration of Spatula Method for Potting Adhesive

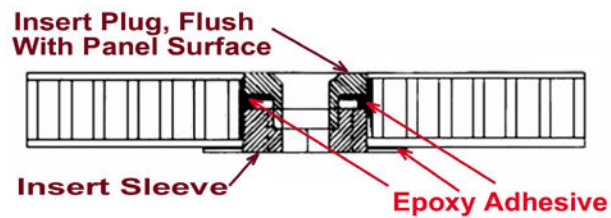
Step 1: Application of potting adhesive to routed-out area of panel



Step 2: Apply a generous quantity of adhesive to the panel interior.



11.3.1.6 Cross-Section of Installed Insert



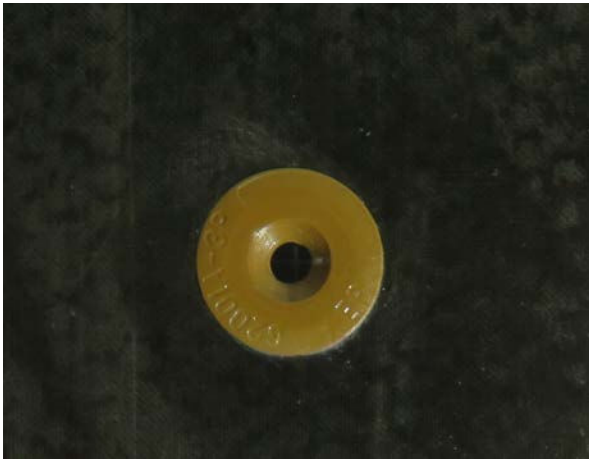
(Note: sleeve with flange must be bonded to the lower facing of panel)

11.3.2 2-Piece Torlon® Inserts for A320 Passenger Floors: TF152

Inserts for passenger floors described in [section 8.1.2](#) and shown in [section 11.10.2](#) have a plug that protrudes above the panel. Installation instructions from [section 11.3.1](#) apply for this insert type and must be followed. Since the plug and sleeve are both flanged, add adhesive to both flanges. Make sure the insert plug, which does not have injection holes, is installed in the panel face. Final appearance should match [section 11.3.2.1](#).

11.3.2.1 Illustration of Installed Insert

Plug, no injection holes, installed on the panel face



Sleeve with injection holes, installed on panel back



11.3.3 1-Piece Aluminum Inserts for Cargo Floors: TF20, TF21, TF110 and TF111

1-piece aluminum inserts TF20, TF21, TF110 and TF111 described in [section 8.1.3](#) and shown in sections [11.10.3](#) to [11.10.5](#) will be flush to the upper panel surface after installation. The level surface is achieved by forming a rolled flange with a special forming tool. The forming tool is available from The Gill Corporation, or can be machined per the appropriate specification drawing shown in sections [11.8](#) or [11.9](#).

The procedures described below are valid for all panel types and locations allowed for use with these inserts per [section 8.1.3](#). TF20 and TF21 inserts without injection holes must follow the spatula method per [11.3.3.3](#). TF110 and TF111 with injection holes can follow either [11.3.3.1](#) or [11.3.3.3](#).

Note: Use a drill diameter of 11.1mm (7/16 or 0.4375 inches) for these inserts.

11.3.3.1 Instructions for Adhesive Injection

Adhesive injection is a faster and more uniform technique for installation, preferred by most customers. Instructions when using the injection method for potting 1-piece inserts are:

Step	Reference	Instruction
1	11.1 & 11.2	Prepare panels, inserts and holes and adhesive as previously described
2	-	If needed, pre-mix adhesive per manufacturer's instructions. A: When using a two-cartridge adhesive package, a hand-operated dispensing gun and mixing nozzle can inject adhesive through the potting holes. Pre-weighing is not necessary B: When using a hand-operated syringe or air-pressure operated gun, adhesive must be pre-mixed and loaded into the applicator.
Note: An applicator diameter of approximately 1.8mm (0.072 inch) is recommended for either injection technique. If using a different diameter, make sure the tip fits into the insert hole to allow proper encapsulation. This will avoid wasting adhesive and difficult cleanup.		
3	11.3.3.2 step 2	Apply adhesive to the flange of the insert (bottom) before installing in the panel. Do not place adhesive inside the panel.
4	11.3.3.2 step 4	Place the insert with flange into the lower face (the thinner face for non-symmetric panels)
5	-	Place the panel insert assembly on a firm surface, with the flange down
6	11.3.3.2 step 5	Align the forming tool with the insert
7	11.3.3.2 step 5 or 6.	Form the rolled flange of the insert against the top face of the panel with an arbor press so that the insert is flush or slightly below the panel surface. If not available, carefully tap the forming tool with a hammer to form the rolled flange. Take care not to damage the panel or insert.
8	-	Verify that only a small quantity of adhesive squeezed out from underneath the flange, so that enough adhesive remains to provide an adequate bond to the panel.
9	11.3.1.3	Put the mixing nozzle into one of the 2.3mm (0.092 inch) insert holes and inject adhesive until it flows out the opposite hole and no air bubbles come out. Wait a minute for more air, then inject more adhesive into the opposite hole.
10	11.3.1.3	Remove excess adhesive from upper and lower facings using a dry cloth. If necessary, a slight amount of solvent can be added to the cloth in order to help. Do not apply solvent directly to the panel.
11	-	Use a cotton swab to remove adhesive in the hole through the insert.
12	11.3.3.2 steps 7 and 8	Inspect that the insert seated properly, the flange is not broken, the insert hole is clear and the panel is reasonably clean.
13	-	Allow the panel to cure at room temperature or use accelerated temperature, per manufacturer's instructions, so that the adhesive develops adequate strength prior to use. Typical cure times are 3-5 days at 23°C (73°F) or 2 hours at 60°C (140°F). Do not exceed 82°C (180°F).

11.3.3.2 Illustration of Insert Installation

Step 1: Clean insert before installation. (TF110 shown)



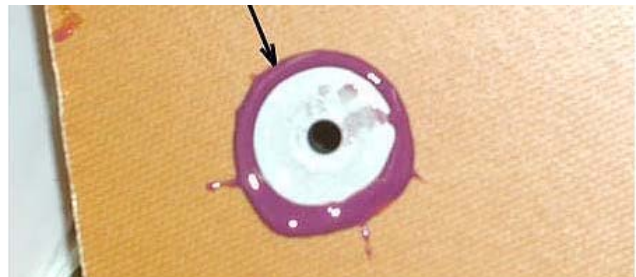
Step 2: Apply adhesive on the flange (injection method).



Step 3: Apply adhesive to insert flange and barrel (spatula method)



Step 4: Place insert in bottom panel skin. Do not squeeze out too much adhesive



Step 5: Form the rolled flange with an arbor press



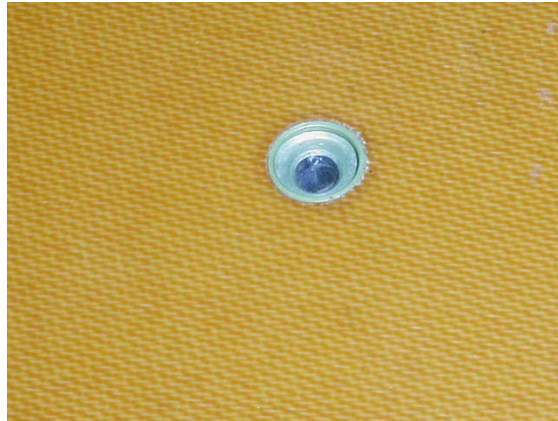
Step 6: If needed, a hammer can be used to form the rolled flange. Tap carefully to avoid damage.



Step 7: Appearance of the back side of the panel (flange side) with the installed insert. (TF110 shown)



Step 8: Appearance of the face side of the panel with the installed insert. (TF110 shown)



11.3.3.3 Instructions for Spatula Method

Step	Reference	Instruction
1	11.1 & 11.2	Prepare panels, inserts and holes as previously described
2	-	Mix adhesive per manufacturer's instructions. Make only the amount that can be used in 30-40 minutes.
3	11.3.1.5 step 1	Apply adhesive with a small spatula or trowel to the routed out areas of the panel.
4	11.3.1.5 step 2	Check that there is sufficient adhesive applied in the panel to encapsulate the installed insert completely.
4	11.3.3.2 step 3	Apply adhesive to the flange of the insert (bottom) and around the barrel before installing in the panel.
5	11.3.3.2 step 4	Place the insert with flange into the lower face (the thinner face for non-symmetric panels)
6		Place the panel insert assembly on a firm surface, with the flange down
7	11.3.3.2 step 5	Align the forming tool with the insert
8	11.3.3.2 step 5 or 6	Form the rolled flange of the insert against the top face of the panel with an arbor press so that the insert is flush or slightly below the panel surface. If not available, carefully tap the forming tool with a hammer to form the rolled flange. Take care not to damage the panel or insert.
9	-	Verify that only a small quantity of adhesive squeezed out from underneath the flange, so that enough adhesive remains to provide an adequate bond to the panel.
10	11.3.1.3	Remove excess adhesive from upper and lower facings using a dry cloth. If necessary, a slight amount of solvent can be added to the cloth in order to help. Do not apply solvent directly to the panel.
11	-	Use a cotton swab to remove adhesive in the hole through the insert.
12	11.3.3.2 steps 7 and 8	Inspect quality of insert installation.
13	-	Allow the panel to cure at room temperature, or use accelerated temperature, per manufacturer's instructions, so that the adhesive develops adequate strength prior to use. Typical cure times are 3-5 days at 23°C (73°F) or 2 hours at 60°C (140°F). Do not exceed 82°C (180°F).

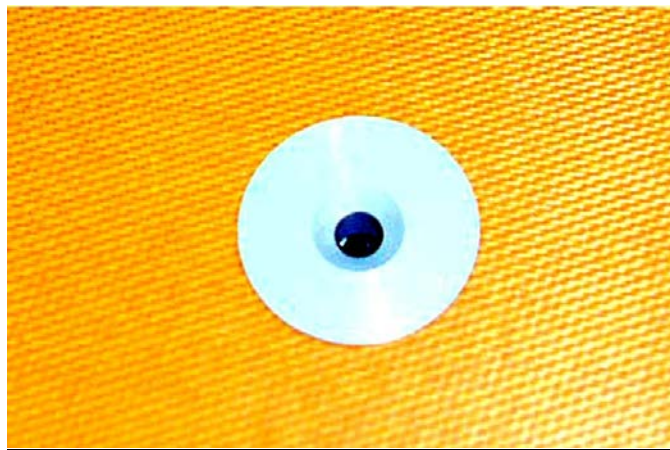
11.3.4 2-Piece Aluminum Inserts for Passenger and Cargo Floors: T303 and T307

2-piece aluminum inserts T303A plug/T303B sleeve and T307A plug/T307B sleeve described in [section 8.1.4](#) and shown in [section 11.10.6](#) have a plug that protrudes above the panel surface after installation. The procedures described below are valid for the panel types and locations allowed for use with these inserts. These inserts do not have injection holes and must follow spatula method instructions as described in [11.3.1.4](#). Since the plug and sleeve are both flanged, add adhesive to both flanges. Make sure both flanges completely bond to the panel surfaces. Take care that the insert plug is bonded to the top face of the panel so that the countersunk part of the insert allows attachment on the aircraft.

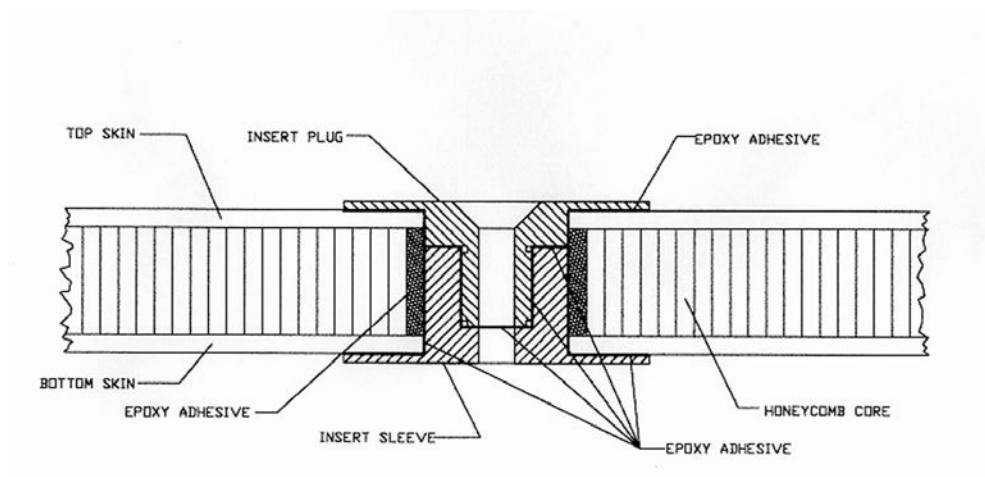
Note: Use a drill diameter of 11.1mm (7/16 or 0.4375 inches) for these inserts.

It is possible to generate desired outcome strengths from T303A/B and T307A/B without routing the core and adding potting adhesive. Fabricators wanting to skip those recommended steps must demonstrate insert shear strength compliance via testing. The process outlined in [section 6](#) must be repeated to skip these steps. The Gill Corporation has found that routing the core and potting with adhesive provides higher and more consistent insert strength.

11.3.4.1 Illustration of Insert as Installed – Upper Facing



11.3.4.2 Cross-Section of Insert as Installed

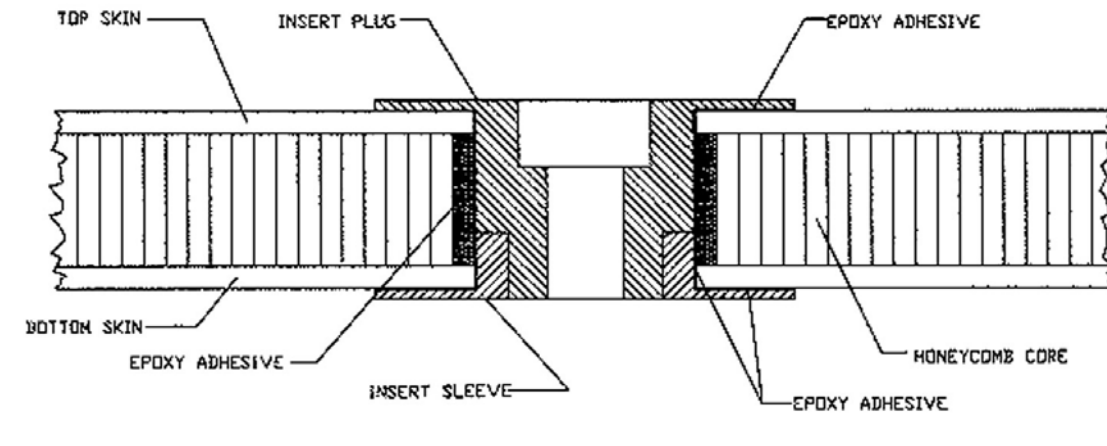


11.4 Hardpoint Insert Installation

Hardpoint Inserts provide reinforced attachment points and generally follow the installation procedure for 2-piece inserts in [section 11.3.1](#). The larger diameter of the insert likely requires the use of a hole saw or router bit to avoid damaging skins while machining.

Note: Use a drill diameter of 31.75mm (1 ¼ or 1.25 inches) for T304, T305 and T308 inserts. Use a drill diameter of 38.1mm (1 ½ or 1.50 inches) for T306.

11.4.1 Drawing of Installed Hardpoint



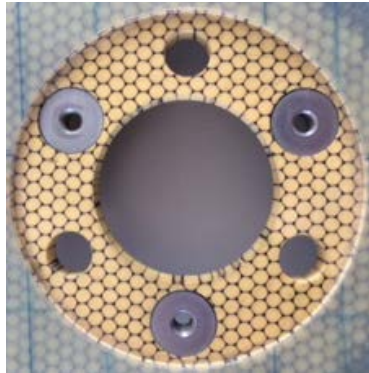
(Note: figure not to scale.)

11.5 Threaded Insert Installation

All threaded inserts shown in [section 8.3](#) are added directly into TGC panels without the need for composite plugs. Tooling selection, tool use, insert degreasing and general principles for working with composite panels, adhesives and edge fill should align with [sections 9](#), [10](#) and [11](#). In all cases, insert, adhesive and edge fill manufacturer's instructions should be followed for mixing and curing of adhesives and edge fill. Hole sizes below are listed for convenience; insert manufacturer's instructions for hole size should be followed in case of any discrepancy.

For all threaded insert types, procedures below have been shown with the faceskins remaining on the panel. The same general process is followed in cases where the Airbus drawing shows a step-down solution with the faceskin removed and edge fill placed into the core, as shown in [section 11.5.1](#). Remove the faceskin and fill the exposed core with edge filler prior to installing the inserts in these cases.

11.5.1 Illustration of Step-Down Installation



11.5.2 NAS 1833 and 1834

In the desired location, drill a hole 14.2 – 14.4mm in diameter (0.561 – 0.566”) through the panel. Prepare the panel and inserts as described in [section 11.1](#). Place tabs on top of the insert and place the insert into the hole. Place any suitable masking or barrier tape to the opposite side of the panel to prevent adhesive loss in the next step. Masking tape is sufficient for this purpose, but alternate tape choices that support the same function, do not inhibit cure of the adhesive and do not cause damage to the panel when removed are allowed.

Adhesive mixed per manufacturer instructions is slowly injected into the insert tab holes until a small stream of adhesive is expelled from the opposite hole. After 12 hours of wait time at room temperature ambient conditions, the tab and tape are gently removed. Excess adhesive remaining on top of the insert is removed, and the installation cured per adhesive manufacturer recommendation.

11.5.2.1 Illustrations of Tabbed Inserts

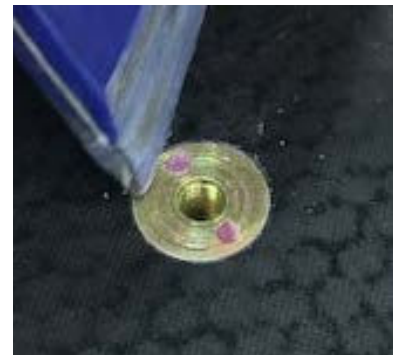
Tabbed insert placed in panel



Adhesive added



Excess adhesive removed



An alternate installation method is allowed. Drill a hole sized 14.2 – 14.4mm in diameter (0.561 – 0.566”) through the panel, remove core between the faceskins per [section 11.2 step 3](#), apply edge fill into the routed undercut area, smooth surface of the edge fill, and cure per edge fill manufacturer’s instructions. The insert can now be installed with potting adhesive as described above.

11.5.3 NAS 1835

This procedure should be identical to the description for NAS1833 / NAS1834 in [section 11.5.2](#), except that holes sized 17.4 – 17.6mm (0.686 – 0.691”) should be drilled through the panel in the appropriate location.

An alternate installation method allowed is to drill the hole sized 17.4 – 17.6mm (0.686 – 0.691”) through the panel, remove core between the faceskins as shown in [section 11.2 step 3](#), apply edge fill into the routed undercut area, smooth surface of the edge fill, and cure per edge fill manufacturer’s instructions. The insert can now be installed with potting adhesive as described in [section 11.5.2](#).

11.5.4 NAS 1836

This procedure should be identical to the description for NAS1833 / NAS1834 from [section 11.5.2](#), except that holes sized 11.5 – 11.6mm (0.452 – 0.457”) should be drilled through the top facing of the panel in the appropriate location, taking care not to drill through the bottom faceskin. Core should be removed so that $\leq 1.27\text{mm}$ (0.05”) of core remained from the bottom faceskin, at the same diameter as the hole. Core remaining is for a panel that is 9.5mm thick (0.374”), adjust appropriately for other panel thicknesses. Test that sufficient core has been removed by ensuring the insert can be installed flush to the top face of the panel. Continue insert installation as described in [section 11.5.2](#).

An alternate installation method allowed is to drill the hole sized 11.5 – 11.6mm (0.452 – 0.457”) as described above, remove core between the faceskins as shown in [section 11.2 step 3](#), apply edge fill into the routed undercut area, smooth surface of the edge fill, and cure per edge fill manufacturer’s instructions. The insert can now be installed with potting adhesive as described in [section 11.5.2](#).

11.5.5 DAN401-3

Holes sized 14.4 – 14.6mm (0.567 – 0.575”) should be drilled through the panel in the appropriate location as described in [section 11.1](#). Because the DAN401-3 insert is significantly smaller on the top than the bottom, and it is important to use the inner threads after installation, a temporary method should be used to block adhesive ingress during insert installation. One possible method is to place a protected screw into the threads during adhesive addition. Poly tape was found to be sufficient for this purpose, as shown in [section 11.5.5.1](#), but alternate methods that prevent adhesive ingress are allowed.

Inserts were cleaned according to [section 11.1](#). Manufacturer tabs were placed on bottom of the insert and the insert placed into the hole.

Mixed adhesive should be added into the hole until full. After 12 hours of wait time at room temperature ambient conditions, the tab and screw should be gently removed. The installation should be cured per adhesive manufacturer recommendation.

An alternate installation method allowed for DAN401-3 inserts is to use edge fill instead of potting adhesive, keeping all other installation instructions the same.

11.5.5.1 Illustration of Adhesive Ingression Prevention

Preventing adhesive
ingression into threading



Adhesive set-up while
preventing ingression into
threading



After adhesive cure, check of
clean threading



11.5.6 ABS1006

Install ABS1006 inserts with the same methodology used for NAS 1836 in [section 11.5.4](#). Hole sizing and depth of core removal should be appropriately adjusted.

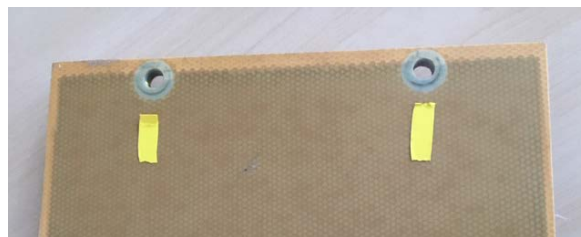
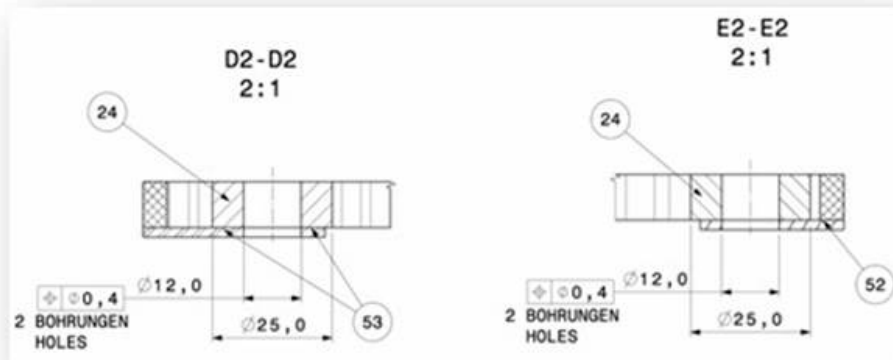
11.6 No-Insert Installations

At times, original equipment may include build in attachment points that do not exactly match the repair solutions described with inserts. Small holes using built in plugs in original equipment can typically be repaired with a routed through hole with edge filler. As small hole routing depth is limited, the following guidelines are provided for long range cargo compartments with panel type CCC1.

Hole Diameter Size mm	Routing Depth Minimum mm
4-8	1.5
8-13	3
>13	6

11.6.1 Example, A330 Cargo Floor 12mm hole

In this example, the original CCC1 panel contained a 12mm through hole on a panel joint with a 25mm built in plug as shown below.



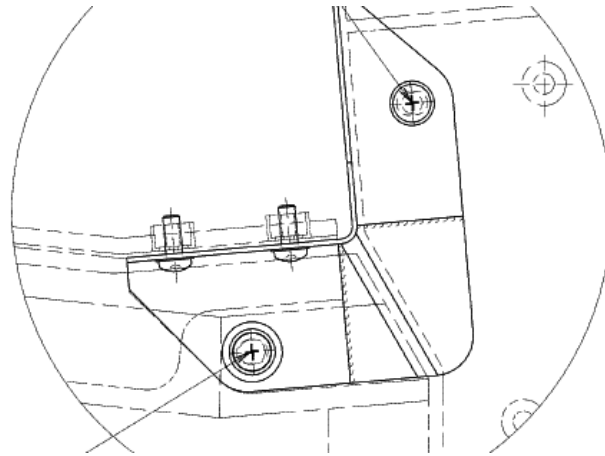
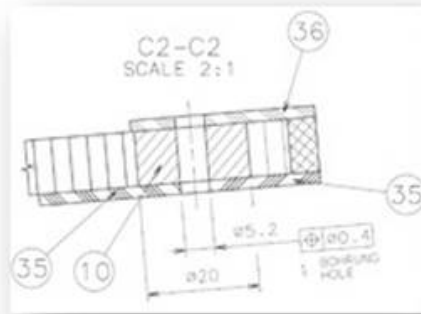
To replace this feature with The Gill Corporation panels, drill a 12mm diameter hole, remove 3mm of core by routing per [section 9.2](#), adding an approved edge filler from [section 8.5](#) into the routed area. After curing, smooth edges if needed and use the hole as before, with no insert required.

11.7 Non-Standard Insert Installation Locations

Attachment points to brackets or other locations requiring shear load transfer to the floor will require inserts, and might initially appear exotic in their configuration. These can be replaced with 2-piece aluminum inserts as described in [section 11.3.4](#).

11.7.1 Example, A320 Family Main Deck

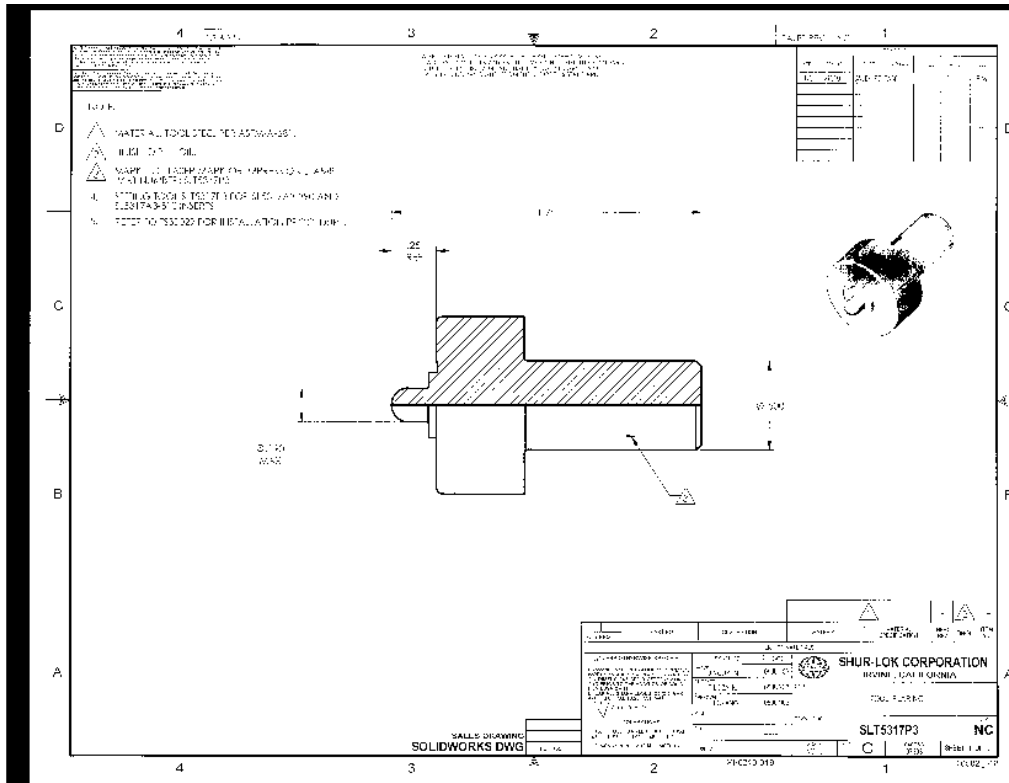
In this case, the design solution of the floor panel includes later assembly with a bracket.



2-piece aluminum inserts can be used for this situation where the original design used a composite plug. The smaller diameter flange of T307 can at times be preferred. Because these inserts are countersunk on the upper face, please use the appropriately angled screw or bolt for attachment.

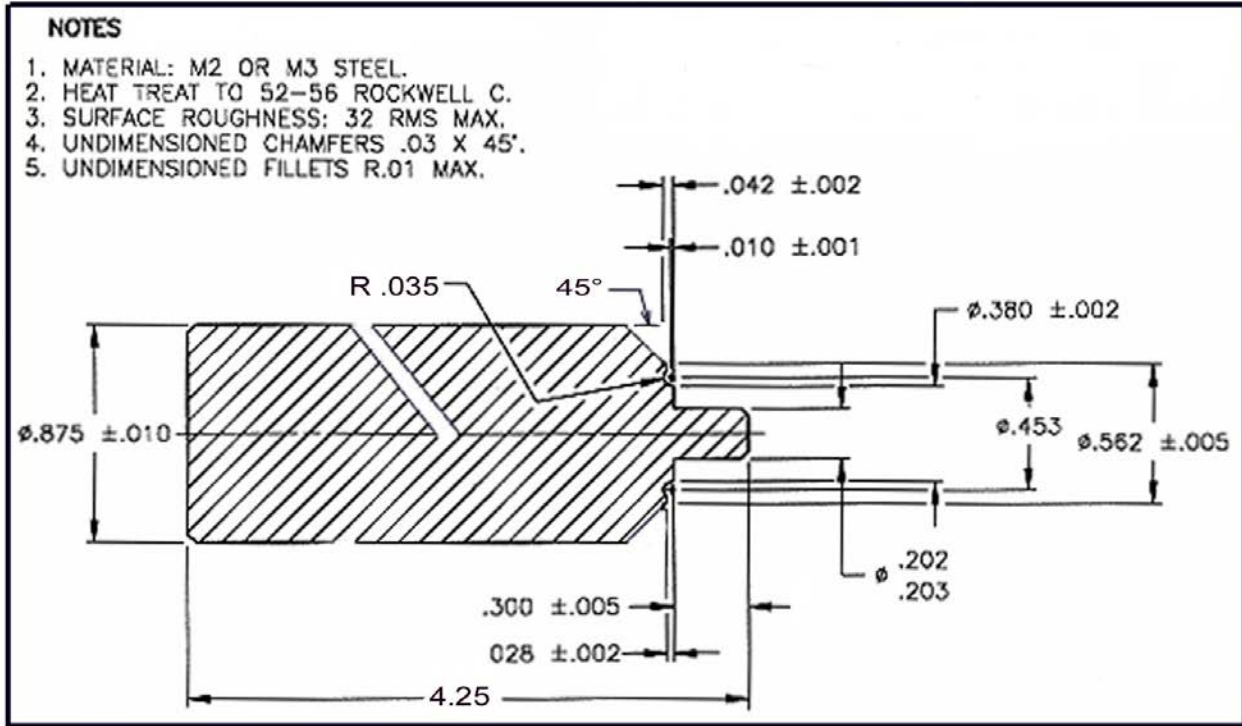
11.8 Forming Tool for 1-piece Aluminum Inserts TF110 and TF111

The 1-piece aluminum inserts TF110 and TF111 described in [section 11.3.3](#) require a special forming tool to install. **Note that this is not the same forming tool used for TF20 and TF21 inserts.** The tool can be obtained from The Gill Corporation or can be machined according to this schematic:



11.9 Forming Tool for 1-Piece Aluminum Inserts TF20 and TF21

The 1-piece aluminum inserts TF20 and TF21 described in [section 11.3.3](#) require a special forming tool to install. **Note that this is not the same forming tool used for TF110 and TF111 inserts.** The tool can be obtained from The Gill Corporation or can be machined according to this schematic:



11.10 Insert Schematics

Shown below are diagrams detailing the specifications to which each insert is manufactured. These are given for reference purposes and are not given as machining instructions to the panel fabricator. **ONLY AIRBUS APPROVED COMPONENTS MAY BE USED IN PANEL FABRICATION.**

11.10.1 2-Piece Torlon® Inserts TF073, TF074

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G2102A-(3)S SLEEVE

GAA588AF-XXX ASSEMBLY PART NUMBER

G2101A-3P-XXX PLUG

TABLE I COUNTERSINK & THRU BOLT SIZE

PART NUMBER	(CSK) Ø C	INSTALLATION HOLE SIZE
G2101A-3P-XXX	.385	.590 (19/32")
G2102A-3S	N/A	.590 (19/32")

MATERIAL: POLYAMIDE-IMIDE (TORLON) 4203L

INSTALLATION:
INSTALLATION HOLE SIZE SHOULD BE 0.590 in. (15 mm or 19/32")

NOTES:

- APPROXIMATE WEIGHT FOR -3S (SLEEVE) IS 1.1 GRAMS.
- INSERT ASSEMBLY SHALL ACCOMMODATE A PANEL THICKNESS DETERMINED BY THE PLUG -XXX CALLOUT IN .000".
EXAMPLE... G2101A-3P-375 FITS PANEL THICKNESS OF .375"
- ASSEMBLY CALLOUT NO. GAA588AF-XXX, IS SIMPLY DEFINED BY THE PLUG'S -XXX
EXAMPLE... GAA588AF-375 FITS PANEL THICKNESS OF .375"
- PIN G2102A-3S IS THE SLEEVE USED IN EITHER GAA588AF-375 or GAA588AF-500 SIZE ASSY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCE ON DECIMALS
X =
XX = ± .02
XXX = ± .010
ANGLES = 2°

CODE IDENT.
62063

Marketing Masters

MARKETING MASTERS, INC.
P.O. BOX 675, Issaquah, WA 98027
425/454-5610 Fax 425/454-2932

SCALE 2:1
DATE 1/5/02
DRAWN JPG
REVISED 11/23/20

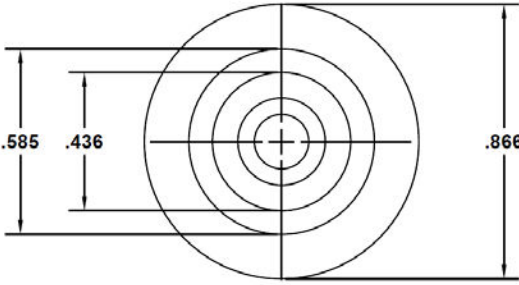
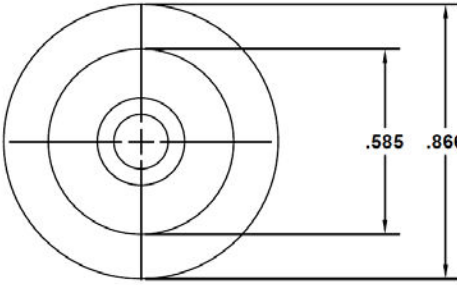
**FLUSH HEAD STYLE
INSERT, PANEL FASTENER
NON-METALLIC, PLUG, SLEEVE**

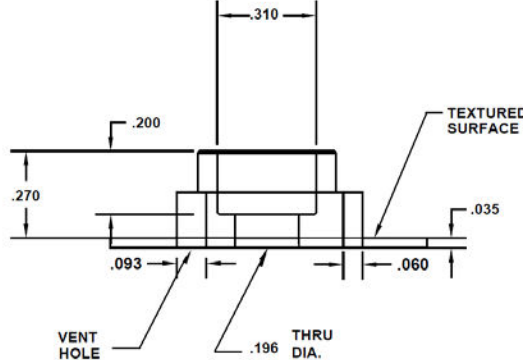
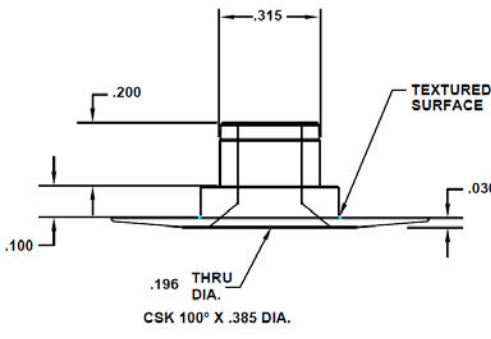
APPROVED Richard F. Gauron DWG NO. GAA588AF SHT 1 OF 1 REV G

11.10.2 2-Piece Torlon® Insert TF152

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G2002A-3S
SLEEVE

GAA588A-3
ASSEMBLY PART NUMBER

G2001A-3P
PLUG

**MATERIAL: POLYAMIDE-IMIDE, PAI per ASTM D 5204
PAI000R03A56316E11FB41, Torlon 4203L-HF**

NOTES:

- STANDARD INSERT ASSEMBLY SHALL ACCOMODATE A PANEL THICKNESS RANGE OF .364 TO .384; PROVIDING A GRIP LENGTH OF .374 INCHES.
- OTHER GRIP LENGTHS AVAILABLE TO FIT A VARIETY OF PANEL THICKNESS RANGES. DETERMINE PANEL THICKNESS & SEE TABLE II FOR PROPER DASH NO.
- APPROXIMATE WEIGHT FOR -3P (PLUG) IS .80 GRAMS, FOR -3S (SLEEVE) IS 1.1 GRAMS.
- G2102A-3S (GAA588AF) is equivalent to G2002A-3S

APPLICATION:
PLUG AND SLEEVE USED IN NON-METALLIC SANDWICH STRUCTURE FLOOR PANELS INSTALLED FROM BOTH SIDES OF PANEL. REQUIRES ADHESIVE BONDING OF SLEEVE AND PLUG TO PANEL FACE SKINS AND POTTING THRU SLEEVE VENT HOLES. INSTALLATION INSTRUCTIONS ON MM DWG GAA588A 2/2.

INSTALLATION:
INSTALLATION HOLE SIZE SHOULD BE 0.590 in. (15 mm or 19/32")

TABLE II GRIP LENGTH

SECOND DASH NUMBER "L" = XXX (IN INCHES)
IS GRIP LENGTH

ADD SECOND DASH NUMBER TO BASIC P/N
FOR NON-STANDARD GRIP LENGTHS
STANDARD GRIP LENGTH = .374"


BASIC P/N	NON STANDARD P/N EXAMPLES
GAA588A-3 (STANDARD ASSY)	GAA588A-3-500
= G2002A-3S & G2001A-3P (.374 GRIP LENGTH)	= G2002A-3S-500 & G2001A-3P-500 (.500 GRIP LENGTH)

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

TOLERANCE ON DECIMALS

.XX = ±.02
.XXX = ±.010
ANGLES = 2°

CODE IDENT.
62063



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DATE 3/28/00

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REVISED 01/10/18

APPROVED *Richard F. Gauron*

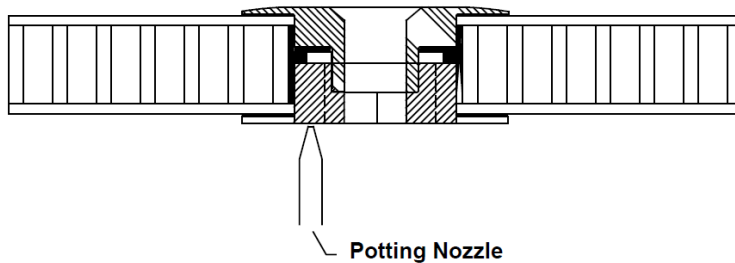
**INSERT, PANEL FASTENER
NON-METALLIC, PLUG, SLEEVE**

DWG NO. **GAA588A SHT 1 OF 2**

REV. **G**

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- A. Store and handle inserts in a manner that does not cause damage or contamination from water, oil, grease, dirt, fingerprints, or other foreign material detrimental to bonding. If inserts become contaminated, degrease or solvent clean in an appropriate manner with MEK, alcohol or Citra Safe.
- B. Before installing inserts, clean each hole of any debris or loose core caused by the drilling operation. Remove any debris from the surface of the panel, taking special care to keep the area adjacent to the holes clean. If the area is contaminated, wipe it clean with a clean dry cloth.
- C. Using a small spatula, spread a thin layer of adhesive on the panel skin surfaces surrounding the installation hole (area to encompass the entire insert flange).
- D. Use enough adhesive such that a small amount squeezes out from underneath the flange when the insert is seated.
- E. Install the insert sleeve first, in the bottom of the panel, then place the insert plug in the top. The two insert parts can be pressed together by means of an arbor press, or by tapping gently with a hammer with the assembly supported by a sound surface.
- F. Using a small nozzle, inject adhesive into one of the vent holes (this is the potting process) filling in the honeycomb voids. Inject enough adhesive in the hole to pot the insert barrel. Adhesive should exit out of the vent hole opposite the one being injected through.
- G. Clean excess adhesive from the surface with a cloth dry or dampened with a suitable solvent. Remove excess adhesive from the hole through the assembled insert with a cotton swab. Take care not to wet the bondline.
- H. Cure adhesive by supplier's specification. Handle the panels carefully to prevent movement of the inserts during the first 12 hours if cured below 140 F.



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

TOLERANCE ON DECIMALS

.XX = ±.02
.XXX = ±.010
ANGLES = ±2°

CODE IDENT.
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SCALE	NTS
DATE	03/28/00
DRAWN	JPG
REVISED	01/10/18

**TYPICAL INSTALLATION PROCEDURE
FOR GAA588A 2 PIECE INSERT
(NON METALLIC) PLUG & SLEEVE**

APPROVED	<i>Richard F. Lauren</i>	DWG NO.	GAA588A SHT 2/2	REV.	G
----------	--------------------------	---------	-----------------	------	---

11.10.3 1-Piece Alumium Inserts TF110 and TF111

CUSTOMER REV: _____


SALES REV: NC

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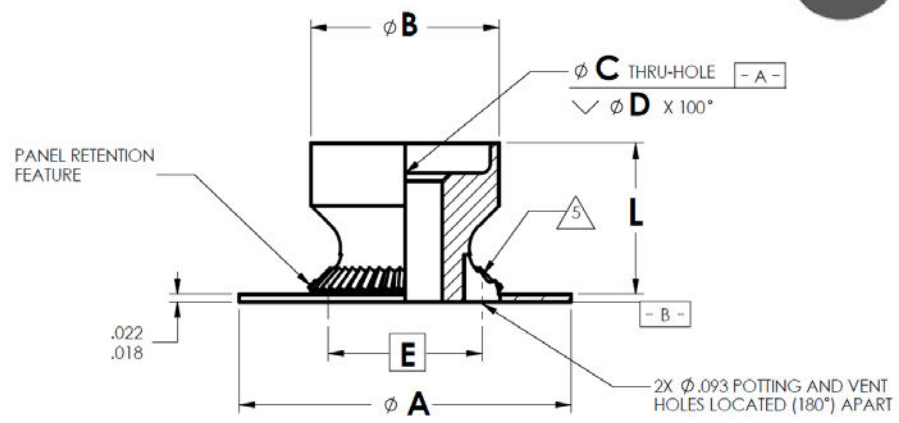
This part has sufficient strength to meet the intended design loads and parameters. SHUR-LOK assumes no liability if parts are subjected to load conditions that exceed the design parameters. It is the user's responsibility to establish a Mean Time Between Failure for part performance. The Mean Time Between Failure must be specifically tested for having part qualification in order for the material to be established. The requirements of customer or industry specifications and standards only apply to the extent specified on this drawing.

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UNITED STATES PATENT 6,298,633
 EUROPEAN PATENT 99650123.5-2309
 REPUBLIC OF CHINA PATENT 134981



LTN	EDNO	DATE	DRWEN	QPED	APPO	REL
NC	20829	SALES RELEASE			27JAN03	EM
A	21316	05JUN03	JN	TL	TL	EM



2X ϕ .093 POTTING AND VENT HOLES LOCATED (180°) APART

TABLE I

SIZE CODE	ϕ A	ϕ B +0.000 -0.004	ϕ C	ϕ D	E BASIC	INSTALLATION HOLE SIZE
3	.875	.497	.196	.240	.405	.500-.505

TABLE II

MATL CODE	MATERIAL	STANDARD FINISH
A	AL ALLOY 6061-T6 PER AMS-QQ-A-225/8	PHOSPHORIC ACID ANODIZE PER ASTM D3933 AND APPLY ADHESIVE PRIMER TO ALL EXTERNAL SURFACES (THRU-HOLE, COUNTERBORE, COUNTERSINK AND POTTING HOLES OPTIONAL)

TABLE III

PANEL THICKNESS CODE	PANEL THICKNESS RANGE +0.020 -0.010	L
390	.374	.396
510	.496	.518

NOTES:

- ALL DIAMETERS: ∇ .005 | A | B
- PACKAGING: PARTS SHALL BE PACKAGED IN SEALED COMMERCIAL GRADE (PRIME) FILM POLYETHYLENE BAGS.
- TYPE OF ADHESIVE OR BONDING METHOD USERS OPTION.
- CONSULT SHUR-LOK TECHNICAL SERVICES DEPARTMENT FOR OTHER MATERIALS, FINISHES AND SIZES.
- BURRS PERMITTED UNDER POTTING HOLE AS LONG AS POTTING HOLES ARE NOT RESTRICTED.
- USE SLT5317P3 GUIDE SETTING TOOL.
- REFER TO TSB0029 FOR INSTALLATION PROCEDURE.

EXAMPLE OF PART NUMBER:

SL5317 | A | 3 | -390

— BASIC PART NUMBER

— MATERIAL CODE (SEE TABLE II)

— SIZE CODE (SEE TABLE I)

— PANEL THICKNESS RANGE CODE (SEE TABLE III FOR PANEL THICKNESS RANGE)

**SALES DRAWING
SOLIDWORKS DWG**

UNLESS OTHERWISE SPECIFIED

DRAWING INTERPRETATION PER COMAR22 WORKMANSHIP PRACTICES PER REVISION ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF GOLD FILM LUBRICANT


BREAK ALL SHARP EDGES 0.015 R MAX ALL FILED EDGES 0.005 R MAX

ALL SURFACES

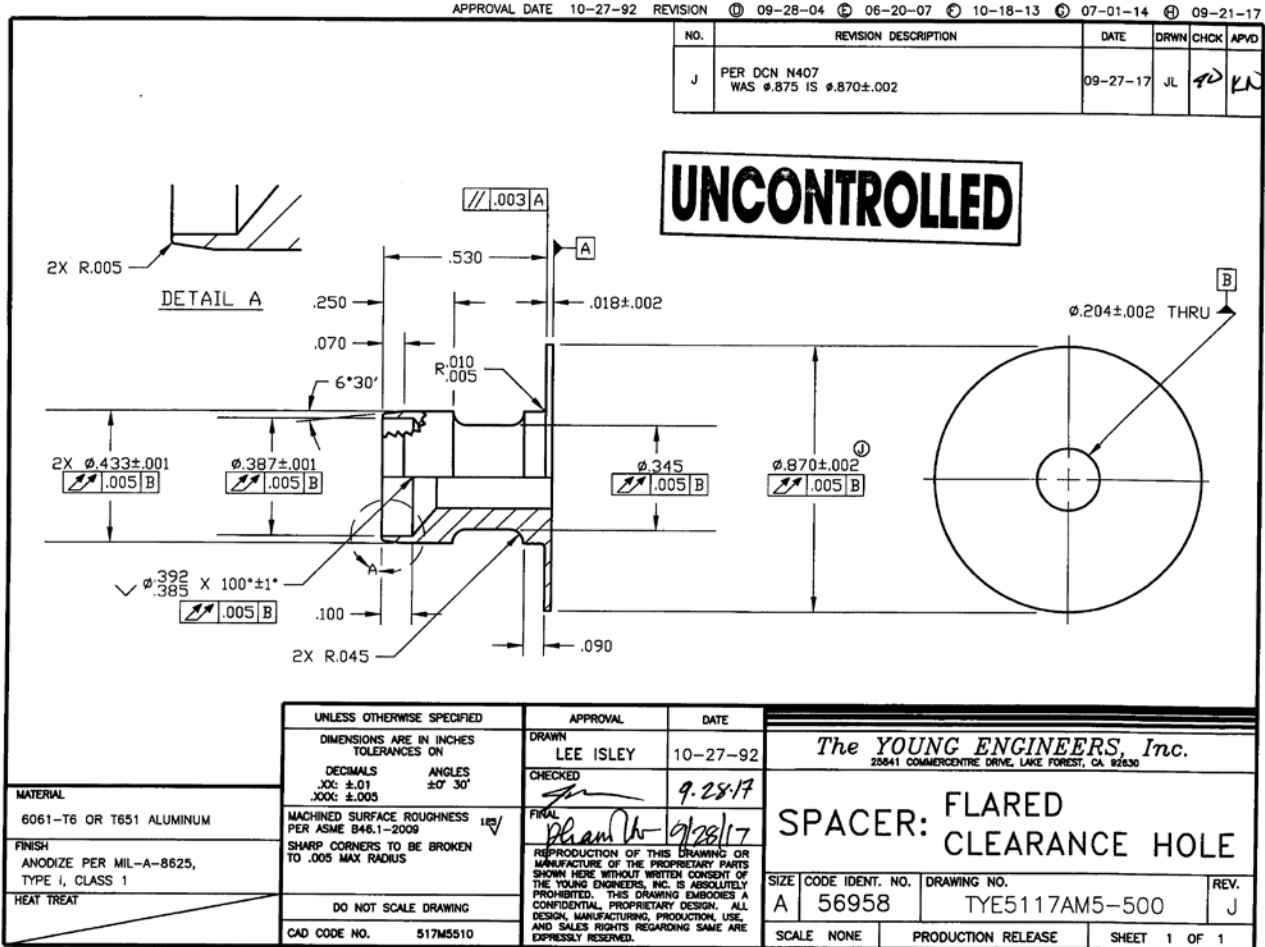
TOLERANCES

XX .XXX ANGLES (X) (X) (X) .03 & 0.10 .02 * .015

DIMENSION IN [] ARE MILLIMETERS

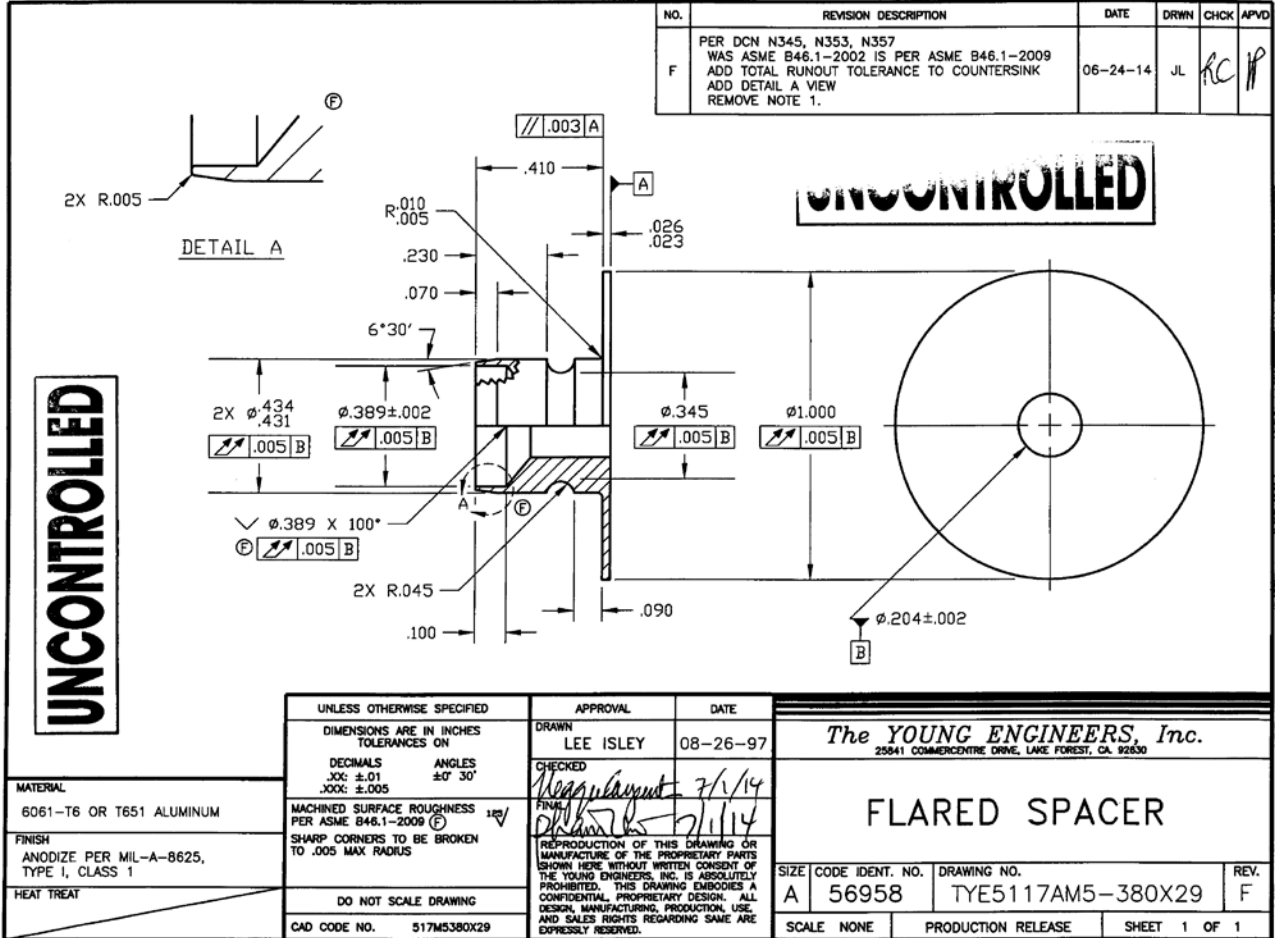
SIGNATURE	DATE	 SHUR-LOK COMPANY IRVINE, CALIFORNIA
DRAWN: P. SECRETS	23JAN03	
CHECKED: J. KALES	24JAN03	
APPROVED: P. SECRETS	24JAN03	
MFG:		TITLE
QA		FLOOR PANEL, FLUSH MOUNT, BONDED-IN/POTTED-IN
ESR NO *	SCALE NONE	DRAWING NO
	SIZE A	SL5317
	CASE NO. 97393	REV A
		SHEET 1 OF 1

11.10.4 1-Piece Aluminum Insert TF20



11.10.5 1-Piece Aluminum Insert TF21

APPROVAL DATE 08-26-97 REVISION (A) 08-28-97 (B) 08-29-97 (C) 03-29-02 (D) 08-01-08 (E) 11-28-11



NO.	REVISION DESCRIPTION	DATE	DRWN	CHKD	APVD
F	PER DCN N345, N353, N357 WAS ASME B46.1-2002 IS PER ASME B46.1-2009 ADD TOTAL RUNOUT TOLERANCE TO COUNTERSINK ADD DETAIL A VIEW REMOVE NOTE 1.	06-24-14	JL	RC	JP

UNCONTROLLED

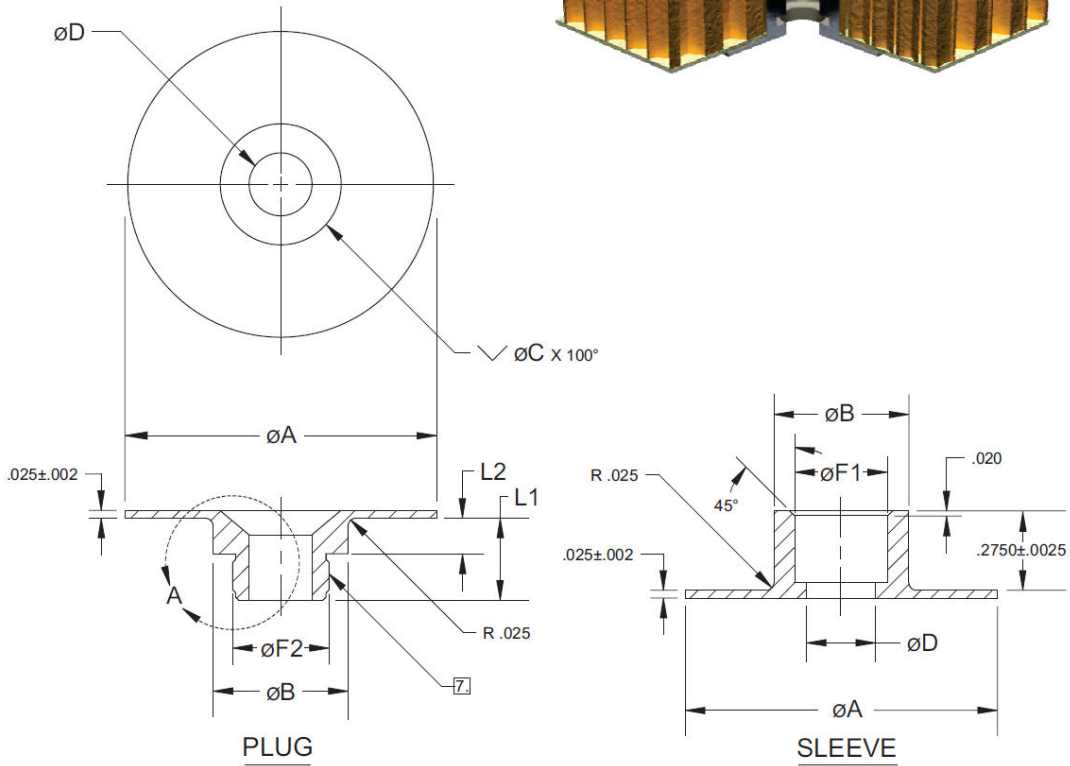
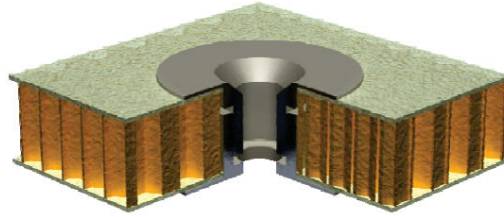
UNCONTROLLED

UNLESS OTHERWISE SPECIFIED		APPROVAL	DATE	The YOUNG ENGINEERS, Inc. 25841 COMMERCENTRE DRIVE, LAKE FOREST, CA. 92650	
DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS .005 ANGLES ±0° 30' .000: ±.005		DRAWN LEE ISLEY	08-26-97		
MACHINED SURFACE ROUGHNESS PER ASME B46.1-2009 (E) 125/		CHECKED <i>[Signature]</i>	7/1/14	SIZE CODE IDENT. NO. DRAWING NO. REV. A 56958 TYE5117AM5-380X29 F	
SHARP CORNERS TO BE BROKEN TO .005 MAX RADIUS		REPRODUCTION OF THIS DRAWING OR MANUFACTURE OF THE PROPRIETARY PARTS SHOWN HERE WITHOUT WRITTEN CONSENT OF THE YOUNG ENGINEERS, INC. IS ABSOLUTELY PROHIBITED. THIS DRAWING EMBODIES A CONFIDENTIAL, PROPRIETARY DESIGN. ALL DESIGN, MANUFACTURING, PRODUCTION, USE, AND SALES RIGHTS REGARDING SAME ARE EXPRESSLY RESERVED.			
MATERIAL 6061-T6 OR T651 ALUMINUM		DO NOT SCALE DRAWING			
FINISH ANODIZE PER MIL-A-8625, TYPE I, CLASS 1		CAD CODE NO. 517M5380X29			
HEAT TREAT					

11.10.6 2 Piece Aluminum Inserts T303 and T307



The YOUNG ENGINEERS, Inc.



PART NUMBER CODING:
 SLEEVE: TYE5319 A 3 - 1
 PLUG: TYE5319 A 3 - 374 - 1

BASIC PART NUMBER [] MATERIAL [] FLANGE CODE: SEE TABLE I
 SIZE CODE: SEE TABLE I [] PANEL THICKNESS CODE: SEE TABLE II (APPLICABLE TO PLUG ONLY)

APPROVAL DATE 10-05-89 REVISION A 02-21-91 B 12-09-13

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES

TOLERANCE ON
 DECIMAL: .02
 ANGLE: ±2°
 XX: ±.02
 XXX: ±.010

The YOUNG ENGINEERS, Inc.

engineering • manufacturing • aerospace fasteners
 25841 COMMERCENTRE DRIVE
 LAKE FOREST, CALIFORNIA 92630

PLUG AND SLEEVE, FLOOR PANEL

SHEET 1 OF 2	CAGE CODE 56958	SERIES NUMBER TYE5319 SERIES
--------------	--------------------	---------------------------------



The YOUNG ENGINEERS, Inc.

TABLE I

SIZE CODE	FLANGE CODE	ØA	ØB	ØC ±.005	ØD ±.003	ØF1 ±.0012	ØF2 ±.001	INSTALLATION HOLE SIZE
3	-1	.875	.433	.390	.204	.2990	.301	Ø.444 - .449
	NO CODE	1.000						

TABLE II

PANEL THICKNESS CODE	L1 ±.0025	L2 ±.0025	PANEL THICKNESS
350	.271	.066	.330 - .379
374	.295	.090	.354 - .403
400	.321	.116	.380 - .429
450	.371	.166	.430 - .479
496	.417	.212	.476 - .525
500	.421	.216	.480 - .529
550	.471	.266	.530 - .579
600	.521	.316	.580 - .629
650	.571	.366	.630 - .679
700	.621	.416	.680 - .729
750	.671	.466	.730 - .779

TABLE III

TYE PART NO	TYPE	M.C. GILL PART NO	
TYE5319A3-374	PLUG	T303A	T303
TYE5319A3	SLEEVE	T303B	
TYE5319A3-374-1	PLUG	T307A	T307
TYE5319A3-1	SLEEVE	T307B	

NOTES:

1. DIMENSIONING AND TOLERANCING PRACTICES PER ASME Y14.5M-1994.
2. DEBURR AND BREAK ALL EDGES .005 - .015.
3. SURFACE TEXTURE: 125 MICROINCHES PER ASME B46.1-2009.
4. MATERIAL: AL ALLOY, GRADE 7075, TEMPER T651 PER AMS-QQ-A-225/9.
5. FINISH: ANODIZE PER MIL-A-8625, TYPE I, CLASS OPTIONAL.
6. PLUG AND SLEEVE TO HAVE A .020 SLIP FIT.
7. PLUG TO HAVE PRESS FIT INTO SLEEVE AFTER NOTE 6.
8. CONSULT THE TYE ENGINEERING DEPARTMENT FOR OTHER FINISHES, MATERIALS OR SIZES.

APPROVAL DATE 10-05-89 REVISION A 02-21-91 B 12-09-13

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

TOLERANCE ON
DECIMAL: ANGLE:
XX: ±.02 ±2°
XXX: ±.010

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25841 COMMERCENTRE DRIVE
LAKE FOREST, CALIFORNIA 92630

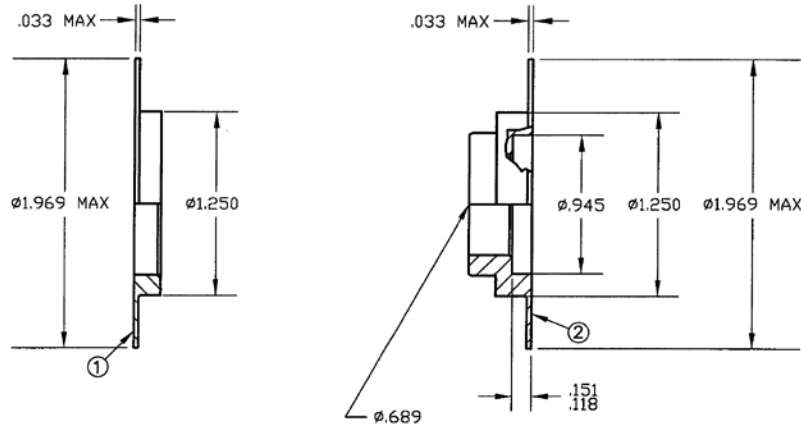
PLUG AND SLEEVE, FLOOR PANEL

SHEET 2 OF 2	CAGE CODE	SERIES NUMBER
	56958	TYE5319 SERIES

11.10.7 Hardpoint Insert T304

APPROVAL DATE 09-15-97 (A) 11-27-98 (B) 05-22-06 (C) 12-27-06 (D) 01-02-08

UNCONTROLLED



NO.	REVISION DESCRIPTION	DATE	DRWN	CHKD	APVD
E	PER DCR R3430 REMOVE "SHARP CORNERS" COMMENT REMOVE REV NO. OF PLUG AND SLEEVE REMOVE THRU	06-27-12	NU		

QTY REQD	FSCM NO.	PART OR IDENTIFICATION NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL / FINISH SPECIFICATION	ITEM NO.
1	56958	TYE5330A1	PLUG	7075-T6 OR T651 ANODIZE PER MIL-A-8825, TYPE I, CLASS I	2
1	56958	TYE5330A1-380	SLEEVE	7075-T6 OR T651 ANODIZE PER MIL-A-8825, TYPE I, CLASS I	1

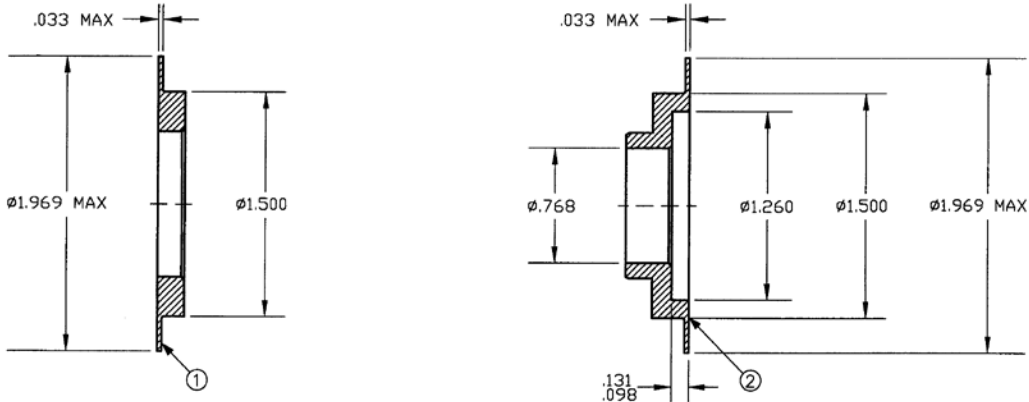
UNLESS OTHERWISE SPECIFIED	APPROVAL	DATE	The YOUNG ENGINEERS, Inc. 25841 COMMERCENTRE DRIVE, LAKE FOREST, CA. 92630 INSERT: LARGE FLANGE PLUG & SLEEVE
DIMENSIONS ARE IN INCHES TOLERANCES ON	DRAWN LEE ASLEY	09-15-97	
DECIMALS ANGLES	CHECKED	6/27/12	
.XX: ±.02 .XXX: ±.010	FINAL	7/3/12	
MACHINED SURFACE ROUGHNESS PER ASME B46.1-2002	REPRODUCTION OF THIS DRAWING OR MANUFACTURE OF THE PROPRIETARY PARTS SHOWN HERE WITHOUT WRITTEN CONSENT OF THE YOUNG ENGINEERS, INC. IS ABSOLUTELY PROHIBITED. THIS DRAWING EMBODIES A CONFIDENTIAL, PROPRIETARY DESIGN. ALL DESIGN, MANUFACTURING, PRODUCTION, USE, AND SALES RIGHTS REGARDING SAME ARE EXPRESSLY RESERVED.		SIZE CODE IDENT. NO. DRAWING NO. REV. A 56958 TYE5330A1-380 E
MATERIAL SEE PARTS LIST	DO NOT SCALE DRAWING		SCALE NONE CUSTOMER RELEASE SHEET 1 OF 1
FINISH SEE PARTS LIST	CAD CODE NO. 5330A1-380		
HEAT TREAT			

11.10.8 Hardpoint Insert T306

APPROVAL DATE 09-10-97 REVISION (A) 01-26-06 (B) 01-02-08

UNCONTROLLED

NO.	REVISION DESCRIPTION	DATE	DRWN	CHECK	APVD
C	PER DCR R3430 REMOVE REV NO. OF PLUG AND SLEEVE REMOVE THRU	10-18-12	SF		<i>[Signature]</i>



QTY REQD	FSCM NO.	PART OR IDENTIFICATION NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL / FINISH SPECIFICATION	ITEM NO.
1	56958	TYEP5331A2	PLUG	7075-T6 OR T651 ANODIZE PER MIL-A-8625, TYPE I, CLASS I	2
1	56958	TYES5331A2-380	SLEEVE	7075-T6 OR T651 ANODIZE PER MIL-A-8625, TYPE I, CLASS I	1

MATERIAL	SEE PARTS LIST
FINISH	SEE PARTS LIST
HEAT TREAT	

UNLESS OTHERWISE SPECIFIED	APPROVAL	DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON	DRAWN <i>[Signature]</i> LEE ISLEY	09-10-97
DECIMALS ANGLES XX: ±.02 ±Z	CHECKED <i>[Signature]</i>	10/18/12
MACHINED SURFACE ROUGHNESS PER ASME B46.1-2002	FINAL <i>[Signature]</i>	10/23/12
DO NOT SCALE DRAWING	REPRODUCTION OF THIS DRAWING OR MANUFACTURE OF THE PROPRIETARY PARTS SHOWN HERE WITHOUT WRITTEN CONSENT OF THE YOUNG ENGINEERS, INC. IS ABSOLUTELY PROHIBITED. THIS DRAWING EMBODIES A CONFIDENTIAL, PROPRIETARY DESIGN. ALL DESIGN, MANUFACTURING, PRODUCTION, USE, AND SALES RIGHTS REGARDING SAME ARE EXPRESSLY RESERVED.	
CAD CODE NO. 5331A2-380		

The YOUNG ENGINEERS, Inc. 25841 COMMERCENTRE DRIVE, LAKE FOREST, CALIFORNIA 92630			
INSERT: LARGE FLANGE PLUG & SLEEVE			
SIZE	CODE IDENT. NO.	DRAWING NO.	REV.
A	56958	TYE5331A2-380	C
SCALE NONE	CUSTOMER RELEASE		SHEET 1 OF 1

11.10.9 Hardpoint Insert T305

APPROVAL DATE 09-11-97 REVISION (A) 01-26-06 (B) 01-02-08

<h1 style="margin: 0;">UNCONTROLLED</h1>		NO.	REVISION DESCRIPTION	DATE	DRWN	CHKD	APVD
		C	PER DCR R3430 REMOVE "SHARP CORNERS" COMMENT REMOVE REV NO. OF PLUG AND SLEEVE REMOVE THRU	07-24-12	NU		

①

②

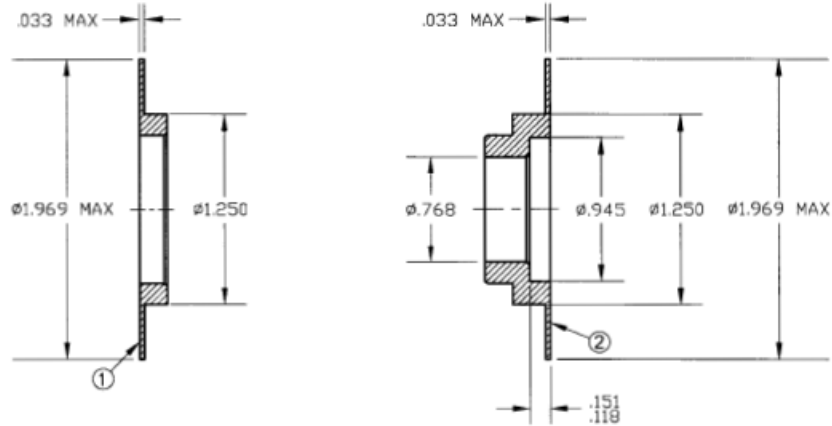
1	56958	TYEP5332A2	PLUG	7075-T6 OR -T651 ANODIZE PER MIL-A-8625, TYPE I, CLASS I	2	
1	56958	TYE5332A2-380	SLEEVE	7075-T6 OR -T651 ANODIZE PER MIL-A-8625, TYPE I, CLASS I	1	
QTY REQD		FSCM NO.	PART OR IDENTIFICATION NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL / FINISH SPECIFICATION	ITEM NO.

UNLESS OTHERWISE SPECIFIED	APPROVAL	DATE	The YOUNG ENGINEERS, Inc. <small>23641 COMMERCIAL DRIVE, LAKE FOREST, CALIFORNIA 92630</small>			
DIMENSIONS ARE IN INCHES TOLERANCES ON	DRAWN <i>LEE ISLEY</i>	09-11-97	<h2 style="margin: 0;">INSERT: LARGE FLANGE PLUG & SLEEVE</h2>			
DECIMALS ANGLES	CHECKED					
.XX: ±.02 3/2	<i>Lee Isley</i>	7/25/12				
MACHINED SURFACE ROUGHNESS PER ASME B46.1-2002	FINAL	<i>Lee Isley</i>	REPRODUCTION OF THIS DRAWING OR MANUFACTURE OF THE PROPRIETARY PARTS SHOWN HERE WITHOUT WRITTEN CONSENT OF THE YOUNG ENGINEERS, INC. IS ABSOLUTELY PROHIBITED. THIS DRAWING EMBODIES A CONFIDENTIAL, PROPRIETARY DESIGN. ALL DESIGN, MANUFACTURING, PRODUCTION USE, AND SALES RIGHTS REGARDING SAME ARE EXPRESSLY RESERVED.			
DO NOT SCALE DRAWING	CAD CODE NO. 5332A2-380		SIZE	CODE IDENT. NO.	DRAWING NO.	REV.
			A	56958	TYE5332A2-380	C
			SCALE	NONE	CUSTOMER RELEASE	SHEET 1 OF 1

11.10.10 Hardpoint Insert T308

UNCONTROLLED

NO.	REVISION DESCRIPTION	DATE	DRWN	CHKD	APVD



QTY REQD	FSCM NO.	PART OR IDENTIFICATION NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL / FINISH SPECIFICATION	ITEM NO.
1	56958	TYEP5330A2	PLUG	7075-T6 OR T651 ALUMINUM, ANODIZE PER MIL-A-8625, TYPE I, CLASS I	2
1	56958	TYE5330A1-380	SLEEVE	7075-T6 OR T651 ALUMINUM, ANODIZE PER MIL-A-8625, TYPE I, CLASS I	1

UNLESS OTHERWISE SPECIFIED	APPROVAL	DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS .XX: ±.02 ANGLES ±2' MACHINED SURFACE ROUGHNESS PER ASME B46.1-2009	DRAWN BELINDA AMPOFO CHECKED <i>[Signature]</i> FINAL <i>[Signature]</i>	06-26-17 12/5/17 12/5/17
DO NOT SCALE DRAWING	REPRODUCTION OF THIS DRAWING OR MANUFACTURE OF THE PROPRIETARY PARTS SHOWN HERE WITHOUT WRITTEN CONSENT OF THE YOUNG ENGINEERS, INC. IS ABSOLUTELY PROHIBITED. THIS DRAWING EMBODIES A CONFIDENTIAL, PROPRIETARY DESIGN. ALL DESIGN, MANUFACTURING, PRODUCTION, USE, AND SALES RIGHTS REGARDING SAME ARE EXPRESSLY RESERVED.	
CAD CODE NO. 5330A2-380		

The YOUNG ENGINEERS, Inc.
22841 COMMERCENTRE DRIV, LAKE FOREST, CA, 92650

INSERT: LARGE FLANGE PLUG & SLEEVE

SIZE	CODE IDENT. NO.	DRAWING NO.	REV.
A	56958	TYE5330A2-380	-

SCALE NONE CUSTOMER RELEASE SHEET 1 OF 1

MATERIAL	SEE PARTS LIST
FINISH	SEE PARTS LIST
HEAT TREAT	

12 Repair of Replacement Floor Panels

12.1 Determination of Repairable Damage

The applicable Airbus SRM is the governing specification for determining the extent of damage which may be repaired. The following sections describe the recommended materials and procedures to be followed to return a damaged floor panel into service.

12.2 Recommended Repair Materials

The following materials are recommended for repairing damaged floor panels. Alternative materials may be substituted with the approval of The Gill Corporation.

Paste Adhesive	Loctite Hysol EA9309.3NA, manufactured by Loctite/Henkel
Honeycomb Core	Gillcore HD365, Nomex honeycomb core, 3/16" (4.8 mm) cell size, 6 lb/ft ³ density, manufactured by The Gill Corporation
Cargo Liner Laminate	Gillfab 1367, 1367A or 1369A, 0.050 – 0.060" (1.3 – 1.5 mm) thick, manufactured by The Gill Corporation
Aluminum Sheet Stock	Aluminum alloy 2024-T3 (3.1364T3) stock, 0.050" (1.3 mm) thick [or equivalent]
Fire Retardant Additives	<p>Use a 3:1 mixture of Firemaster 2100RM to Nyacol A1582, added to the EA9309.3NA adhesive mixture at 20% by weight of the 2 component adhesive system. Mix well to obtain a homogeneous paste adhesive.</p> <p>Trade Name: Firemaster 2100RM</p> <p>Decabromodiphenyl ethane { 1,1'-(1,2-ethanediyl)bis[2,3,4,5,6 pentabromo]benzene }</p> <p>Chemtura Corp</p> <p>710 Bussey Rd</p> <p>El Dorado, Arizona 71730</p> <p>(870) 862-9100</p> <p>www.chemtura.com</p> <p>Trade Name: Nyacol A1582</p> <p>Colloidal Antimony Pentoxide</p>

	<p>Nyacol Products, Inc.</p> <p>221 Megunko Rd</p> <p>Ashland, Massachusetts 01721</p> <p>(508) 881-2220</p> <p>www.nyacol.com</p>
Portable Sander (Optional)	A hand-held belt, orbital, or reciprocating sander can be used to sand the honeycomb core plug to the correct thicknesses. This can ensure the correct repair procedure while reducing the complexity of inventoried materials.
Heating Blanket or Heat Gun (Optional)	These may be used to reduce the cure time of the adhesive (normally 5 – 7 days at room temperature).

12.3 Repair Procedure

1. Remove the facing and honeycomb core from the damaged area without damaging the lower facing. Make the cut larger than the damage in a uniform shape (circle, square, rectangle). If the lower facing is damaged, remove that damage also, leaving at least 0.75 inch (19 mm) shelf of undamaged lower skin with only the core and top skin removed. This will allow for a reinforcing laminate to be bonded to the lower skin.

Attention: Make certain that the cut out area is still within the allowable damage limits specified in the Airbus SRM.

2. If both faces are damaged, cut a piece of cargo liner laminate, described in [section 12.2](#), to the size of the opening in the upper facing, so the laminate is supported by the edges of the lower facing. If only the upper facing is damaged, there is no need for the laminate as the intact lower facing will provide the necessary reinforcement.
3. Prepare the laminate by lightly sanding the back edges (non-Tedlar® side). Wipe the faces with a solvent, such as acetone, to remove all debris and contamination.
4. Prepare a second laminate patch to overlap the edges of the upper opening by at least 0.75 inches (19 mm), and sand the back side of the laminate. Wipe the with solvent to remove any debris.
5. Cut a piece of honeycomb core ([section 12.2](#)) to the size of the opening in the upper facing. Sand the core to the thickness required so that it is flush with the upper surface of the panel. The core will be bonded to the lower facing or patch in a subsequent step. Remove all loose fiber and dust.
6. In an appropriate disposable container, such as a 16-oz plastic cup, weigh out the desired amount of adhesive and fire retardants. Mix thoroughly by hand at room temperature for at least one minute. Use an appropriate mixing tool, such as a wooden tongue depressor or metal spatula. Check to ensure that there are no visible streaks or pockets of powder. Continue mixing until no streaking or visible powder remains.

Example: Using 240.0 ± 2.4 grams of EA9309.3NA adhesive mixture at a 100:22 Part A:Part B ratio, mixed per manufacturer's instructions, add 36.0 ± 3.6 grams of decabromodiphenyl ethane and 12.0 ± 1.2 grams of colloidal antimony pentoxide.

- Mix only the amount of adhesive that can be used in about 30-40 minutes. Adhesive should be applied using a trowel or small spatula.

Note: It may be helpful to let the adhesive to sit for a few minutes before application. This will allow the adhesive to thicken up a bit, so that it will stay in place when applied to the panel.

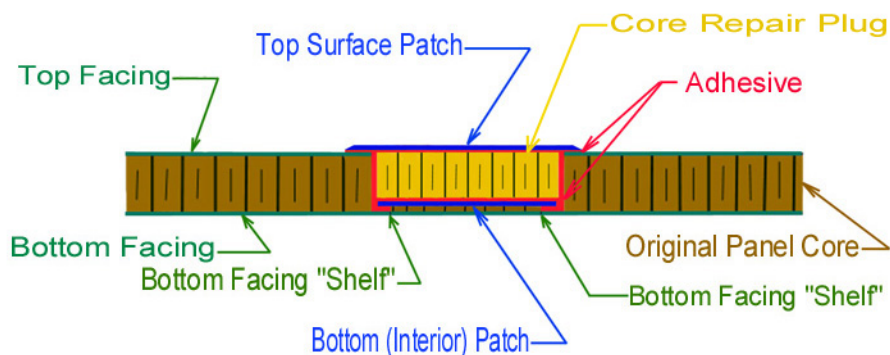
- If only one side of the panel is being patched, then spread adhesive over the entire interior surface of the lower facing. If a patch is used for the both surfaces, first spread adhesive only around the exterior facing edges of the lower patch, and place it on the interior facing edges of the lower facing shelf. Then, spread adhesive over the entire interior surface of the patch. Apply approximately 0.060 lb/ft² (293 g/m²) to all bonding surfaces.
- Apply adhesive around the edges of the honeycomb core plug, and place it in the opening in the panel, on top of the adhesive on the lower surface.
- Spread adhesive on the back of the upper patch and place it on the upper facing and core plug, making sure that the patch overlaps the opening by at least 0.75 inches (19 mm). Place a weight on the patch to hold it in place. Allow the adhesive to cure overnight, or at least 8 hours. The adhesive will develop the maximum strength after 5-7 days at room temperature, but this time may be shortened by postcuring at 175° – 200°F (79° – 93°C) with a heat gun or heating blanket.

Attention: Do not exceed a temperature of 200°F (93°C) when postcuring the adhesive.

12.4 Cross-Section Diagram of Repaired Floor Panel

This diagram shows the configuration of a finished repair in which both facings were damaged. Note that cargo floor panel repair must follow the Airbus SRM. A brief description of these tasks is included in [section 12.5](#).

Cross-Section Diagram of Repaired Floor Panel



12.5 Reference Airbus Repair Documentation

Single Aisle	
TASK 53-02-00-300-015	Repair for Perforation Damage in Zone B and C (Upper Skin or Both Skins Penetrated)
Long Range	
TASK 53-02-00-300-010	Repair of Perforation Damage to both Skins (Upper and Lower) and Core in Zone B
TASK 53-02-00-300-012	Repair of Perforation Damage to both Skins (Upper and Lower) and Core in Zone B and Zone C
TASK 53-02-00-300-015	Repair of Perforation Damage to both Skins (Upper and Lower) and Core in Zone B and Zone C
TASK 53-02-00-300-017	Repair for Impact Damage with Visible Cracks and/or Holes in Zone C (Both Skins Penetrated)
A380	
TASK 53-02-00-338-813-A01	Cargo Compartment Floor Panels - Permanent Repair for Perforation Damage up to 250 mm (9.843 in) in the Upper Skin and 150 mm (5.906 in) in the Lower Skin

Attention: Only Airbus can provide this documentation as The Gill Corporation does not have access to these procedures.