



PCC

FASTENERS



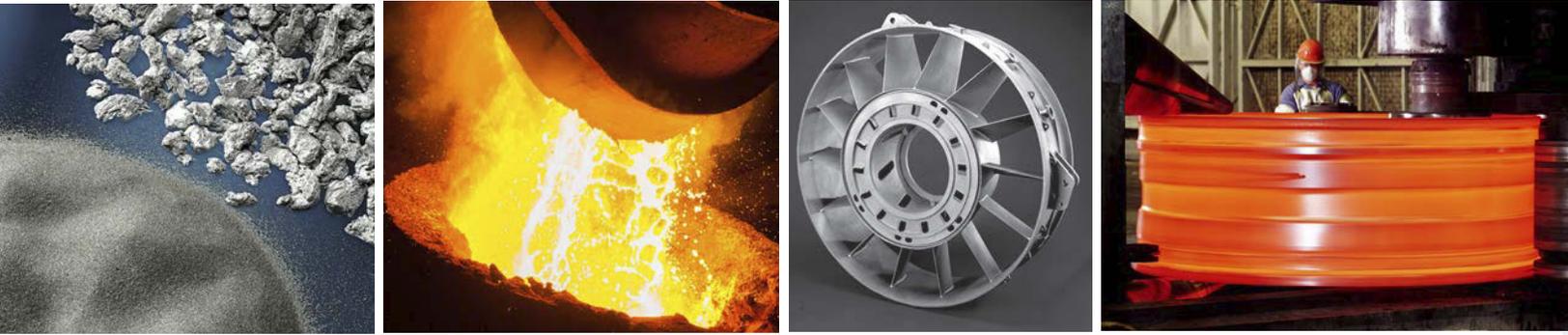
PCC

ENGINEERED PRODUCTS



Aerospace Fasteners and Engineered Products
Fasteners • Mechanical Hardware • Structural Components

PCC Precision Castparts Corp.



PCC's capabilities include specialty materials and alloys, investment cast products, forged products, fasteners, and aerostructures.

Global Manufacturer of Metal Components & Products

- Titanium
- Super Alloys
- Investment Castings
- Forgings
- Composite Parts
- Engineered Products
- Fasteners
- Aerostructures
- Complex Assembly
- Metal Finishing

In addition to critical fasteners and engineered products, PCC is a market leader in manufacturing large complex structural investment castings, airfoil castings, forged components, and aerostructures.

PCC also produces a wide range of high-nickel alloys and one fifth of the world's titanium for the aerospace and energy markets.

With applications that span an aircraft from nose to tail and wing to wing, our products are found in nearly every aviation platform. We support the entire product lifecycle—from prototype to production, and throughout sustainment. PCC delivers innovative solutions today for tomorrow's most demanding design, manufacturing, and service requirements.

With a history that begins well over 100 years ago, PCC's success is based on extensive experience and leadership in the field of metallurgy. Today, Airframe Products' operations spread over 4 continents—a network of industry leading companies allowing our customers to utilize our experience and deep product knowledge wherever they need it—worldwide. Embedded in a culture of continuous improvement, our assets and industry leadership insure that we continue to deliver our customers the best value in the industry.

In the pages that follow, we are proud to present a summary of our vast product and solution capability. For additional detail, current information, and online part and specification search capability we encourage you to visit PCCfasteners.com.





FASTENERS & ENGINEERED PRODUCTS

Designing and manufacturing high performance, high-strength fasteners for critical applications and severe environments is our primary focus.

We ensure product performance and consistency by carefully monitoring and controlling specific manufacturing practices and thoroughly testing our products. PCC has been an industry leader in this area since the early days of aviation, creating new materials, designs, and manufacturing practices to satisfy an ever changing industry—from the first generation of propeller-driven military aircraft to today’s higher temperature gas turbine engines and composite airframes.

PCC offers complete technical support in specifying the best fastener for your application. We work with all the standard fastener configurations, materials, and finishes and are qualified to the majority of commercial and military aerospace standards including ABS, AN, ASNA, BAC, DAN, EN, MS, NAS, NSA, 3D, 3M, and others.

Our threaded fasteners are widely available in both unified and metric standard sizes covering the entire spectrum of diameters and lengths.

When application requirements call for performance that far exceeds that available from traditional materials, PCC turns to its expertise in superalloys to achieve a combination of unique properties.

Fasteners made from our proprietary materials such as MP35N®, MP159®, AEREX®, MP98T®, and SPS TITAN™ 761 titanium alloy deliver strength-to-weight and elevated temperature strength and corrosion resistance to meet the most demanding airframe structural and engine requirements.

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BOLTS, PINS & SCREWS



High-Strength Bolts

- ACR®
- AN/AS/EN/MS/NAS/NA/NSA STANDARDS
- CERTIFIED SHCS
- GROMEX®
- HEX®
- HI-TORQUE®
- HL® (HI-LOK)
- HLT® (HI-TIGUE)
- HST® (HI-LITE)
- MORTORQ®
- PHILLIPS®
- SLEVBOLT®
- TAPER-LOK®
- TORQ-SET®
- TORX PLUS®
- TORX®
- TRI-WING®

Selection of the optimal fastener for an application involves both in-service and installation considerations including required clamp-up, available space and access, weight, service loads and environment, joint materials, and assembly goals and tolerances. Throughout the years PCC

has worked closely with our customers in this pursuit, developing the experience, manufacturing capability, and capacity that today encompass nearly every bolt, pin, and screw style, material, thread size, and length used in the aerospace industry.

BOLTS AND SCREWS

PCC is a market leader in manufacturing high-strength bolts. We utilize standard head configurations (hex, 10-point, 12-point, spline, D) and materials (alloy steel, corrosion-resistant steel, INCONEL® alloy, WASPALOY®, titanium), as well as our own array of fastener superalloys and designs to produce bolts of superior quality and performance.

PCC manufactures all the major recess drive bolts and screws including MORTORQ®, ACR®, Phillips®, Torq-Set®, Tri-Wing®, Hex®, Torx®, Torx Plus®, and Hi-Torque® in fillister, pan, brazier, flush, flat, IWB, SHCS, and other common head configurations.

For safety critical applications, PCC maintains a comprehensive “in-house” manufacturing system for producing certified MS and NAS socket head cap screws to the FF-S-86 procurement specification. Please visit PCCfasteners.com for more information on the costs and risks associated with using non-certified screws.



Recess Drive Bolts and Screws

Custom Solutions

When application requirements exceed that available from traditional materials, PCC Airframe Products turns to its expertise in superalloys to achieve a combination of unique properties.

PIN FASTENING SYSTEMS

Pin fastening systems are torque-controlled fasteners consisting of a threaded pin and self-locking collar. PCC manufactures pins and collars in a variety of materials including titanium, alloy steel, corrosion-resistant steel, INCONEL® alloy 718, and aluminum. We are licensed to manufacture brand name pin systems sold under the trademarks HL® (Hi-Lok), HLT® (Hi-Tigue), and HST® (Hi-Lite).



LOCKBOLT FASTENING SYSTEMS

Lockbolt fastening systems are installed in direct tension by swaging a collar into the lock grooves of the pin. This fastener type provides a high-strength, vibration-resistant joint with uniform clamp-up and excellent fatigue properties. PCC offers a complete line of lockbolt pins, collars, and high-speed installation tools. Products are available in pull or stump type in aluminum, steel, titanium, and CRES materials and in countersunk or protruding head styles per NAS and other industry standards.



HARD CHROME BOLTS AND REPLACEMENTS

PCC is a recognized leader in ultra high tensile strength hard chrome bolting for landing gear and actuation systems. We maintain specialized manufacturing cells for these products and offer alternative finishes for a full range of corrosion and wear-resistant bolts for use in critical applications.



EXPANDABLE DIAMETER FASTENERS

Expandable diameter fasteners are used in critical joints to adjust hole fill to desired levels of interference. They are used in a variety of high vibration and high load transfer joints to provide superior alignment, reduce or eliminate relative movement and wear, and provide quick change capability. Among the many uses are helicopter rotor blade attachments, engine attachments, and external munitions attachments. PCC designs and manufactures expandable diameter fasteners in pin, bolt, blind bolt, and special configurations to suit customer requirements.

SELF-RETAINING BOLTS

Self-retaining bolts are fail-safe shear bolts for use in dynamic joint assemblies such as control linkages for flight surfaces, engine mechanisms, and fuel systems. PCC produces a variety of self-retaining bolt systems, which are available in any style shear bolt. Self-retaining configurations include: Circular Spring, Positive Lock, Impedance, Pawl and Thread End Release.

HOOK BOLTS

Hook bolts (also known as retainer bolts) eliminate loosening in assembly. The retainer, permanently affixed to the head of the bolt, is engaged in an adjacent hole, slot, or over-the-edge of the assembly.

TAPERED SHANK BOLTS

TAPER-LOK® is an interference fit fastening system with a self-sealing feature. The system includes a close tolerance tapered shank bolt and a companion washer-nut which is self-centering and self-locking.

SLEEVED FASTENING SYSTEMS

PCC manufactures two sleeved fastening systems to provide fatigue life enhancement in metal and hole fill in composite aircraft structures. The hole fill provided by both systems has been shown to improve lightning strike performance, electrical conductivity, and mechanical strength in composite joints.

The SLEEVbolt® system installs in a straight hole and uniformly expands to an interference fit as the tightening of the nut draws the tapered bolt into the sleeve having a reverse taper on its inner diameter and a constant outer diameter.

The GromEx® system expands a straight walled sleeve into the structure to be used with any class of fit fastener.

The GromEx® system allows the fastener to be removed and re-installed without removing the sleeve from the hole.



SPECIALTY

PCC has been designing and manufacturing bolts for over 100 years. We've described some of the most common bolts here, but the configurations that we produce are endless. If you do not see what you need, chances are we either already make it or can make it. Please refer to our website or contact a PCC representative for all of your special purpose needs.





NUTS



Wrenchable Nuts

- 6-WING
- CAP
- CLIP
- DOME
- ESNA®
- FLEXLOC®
- FORCETEC®
- GREER STOP NUT®
- LOCKING LUG
- RNP®
- SELF-SEALING
- SPANNER
- STA-LOC®

PCC offers a comprehensive line of nut products covering most every application and environment. Engineers can select the exact features they need from our broad design database and, if you need something purpose specific, we'll work with you to develop a solution.

WRENCHABLE NUTS

From microsize to 2.5 inches in diameter, PCC offers hex, double hex, and spline drive self-locking nuts in a variety of configurations including castellated, lightweight, self-aligning, close clearance, captive washer, flanged, shear, structural shear, high temperature, and high tensile.

The products are available in carbon steel, stainless steel, A286, alloy steel, aluminum, and brass with a wide range of finish options including cadmium, zinc, dull nickel, black oxide, cadmium type II, silver, and dry film lube.

Both unified and metric sizes are available per AN, NAS, MS, NSA, and OEM standards. Please refer to the FLEXLOC®, ESNA®, and GREER STOP NUT® product line catalogs for additional details on PCC standard designs.

Industry Standards

Engineers can select designs from our standard database, which includes product lines such as FLEXLOC®, ESNA®, and GREER STOP NUT®, or consult us for assistance with a solution.

GANG CHANNEL NUTS

Available in straight or radius designs, gang channel nuts provide floating, self-locking, self-wrenching nuts in pre-established position. The nut elements can be channel-fixed or individually removable.

BARREL NUTS

Barrel nuts provide self-wrenching, self-locking attachment points within thick structural joints, thereby reducing the cost and weight of drilling through the entire structure and using a longer bolt. They are designed for use with high tensile strength bolts to join load carrying members. Landing gear to fuselage, engine pods to wings, and nacelle and fuel tank attachments are typical of the many places barrel nuts are used. Fabricated in advanced aerospace alloys, designs include floating or nonfloating, metallic lock or nonmetallic ring, tandem nuts with spreaders, spreaders that articulate, and barrel nuts with attached retainers or lanyards.

BEARING LOCKNUTS

Bearing locknuts are designed for shaft or spindle applications in aircraft engines, gearboxes and transmissions to provide a positive rotational lock under vibratory conditions and maintain precise torque pre-loads. PCC's STA-LOK® system uses a serrated washer that installs onto a serrated shaft and then snaps into or over the nut to retain it. The precision and effectiveness of this mechanical lock has made it the industry design standard. Bearing Locknuts are available in advanced aerospace alloys with either internal or external threads, internal or external wrenching slots or holes, and metallic or nonmetallic locking devices in sizes from 0.5 to 8 inches in diameter.

SHANK NUTS

Shank nuts are high temperature, high tensile strength nuts that are used primarily in aircraft engine applications. The nuts are installed by flaring the nut shank with a conical tool. Standard shank nuts are manufactured in a variety of configurations and materials to OEM standards and specifications.

CLINCH AND SWAGE NUTS

Clinch and swage nuts are designed for thin section, blind fastening such as electronic applications. They are quickly swaged into the parent material using a simple tool to provide high-strength, self locking threads with a small footprint. They are available in steel, stainless steel, brass, and aluminum.

BLADE LOCKS

Blade locks (also known as locking lugs) are specialized nuts used to prevent fan, compressor, and turbine blades from moving axially with respect to the disk at their attachment point. PCC manufactures these nuts and the companion set screws to meet the most stringent OEM requirements.

ANCHOR NUTS

Anchor nuts, also called nut plates, are self-wrenching, self-locking nuts for use in closeout or space constrained areas to provide a permanent nut element on the inside of the joint so that a skin, access panel, fairing, or other member can be attached with a screw. PCC manufactures an extensive line of nut plates covering a full range of sizes, materials, and finishes per AN, AS, NAS, MS, EN, and OEM standards. Nut plate product lines include riveted, clip nut, and rivetless in a variety of configurations including close structural tolerance, high float, ultra high float, self-sealing, and spring-loaded configurations.

RIVETLESS NUT PLATES

RNP® and ForceTec® rivetless nut plates meet customer requirements for fast assembly, reduced part count, enhanced fatigue and damage tolerance performance, and improved electromagnetic effect performance in metal and composite structure.



Barrel Nuts



Gang Channel Nuts



Shank Nuts



Blade Locks



Clinch and Swage Nuts



Anchor Nuts





SPECIALTY FASTENERS

- AVILOK®
- CHERRY 1900®
- CHERRY SST®
- CHERRYBUCK®
- CHERRY E-Z BUCK®
- CHERRY HOLLOW END E-Z BUCK®
- CHERRYLOCK®
- CHERRYMAX®
- E-NUT®
- ENGINE STUDS
- FLOATING INSERTS
- MAXIBOLT®
- MAXIBOLT PLUS®
- RINGLOCK STUDS & INSERTS
- SERIES 3000®
- SOLID WALL STAKED STUDS & INSERTS
- SWAGED INSERTS

Many aircraft assembly requirements are not satisfied by traditional fastening systems. PCC is a leader in developing innovative products for a variety of common yet challenging applications including high speed and automated assembly, sandwich panel installation, assembly of thin sheet, mounting to surfaces that cannot accept through holes, blind assembly, frequent joint access, and optimization of pre-load in highly loaded joints.



Studs and Inserts

STUDS AND INSERTS

PCC studs and inserts provide excellent torque-out and pull-out capabilities in component assemblies that cannot accept a through bolt and nut combination. We offer configurations and materials for use in extreme operating environments such as high vibration, temperature, and cyclic loading. Typical applications for our products include engines, gear boxes, and pumps.

PCC manufactures a complete line of studs, inserts, and associated installation tools to meet all industry, military, and federal specifications including MS, AS, MIL I, NAS, NASM, EN, NA, and NSA standards. Studs and inserts are available in a variety of materials including corrosion and heat-resistant steels, carbon and alloy steels, titanium, Inconel® alloy 718, and MULTIPHASE® alloy in a complete range of unified and metric sizes.

Our product lines include Solid Wall Staked Studs and Inserts, Swaged Inserts, Ringlock Studs and Inserts, Floating Inserts, and Engine Studs.

BLIND RIVETS

For over 70 years, Cherry® has been a leading aerospace rivet brand. Cherry® Blind Rivets were originally developed for structural assembly in areas of the aircraft where installation access is limited to one side of the structure. However, the wide range of standard designs, installation efficiency, and ergonomic benefits has made them a preferred alternative to solid rivets in many applications.

The CherryMAX® system utilizes a simple, single pulling head to install many diameters, head configurations and materials including bulbed versions for thin sheet and bearing load sensitive applications and wiredraw versions for sheet take-up and hole filling.

The CherryLock® system is designed with high tensile, shear, and fatigue strengths and is particularly well suited to double dimple and high vibration areas.



Panel Fasteners



Blind Rivets

Blind Bolts



BLIND BOLTS

PCC's MAXIBOLT® and MAXIBOLT® PLUS blind fasteners install quickly and provide high-strength fastening in a wide range of structural materials and joints. The original MAXIBOLT® line is available in alloy steel, titanium, and CRES in flush and protruding head styles.

The MAXIBOLT® PLUS system comes in stainless steel and titanium in all standard head configurations and grips. Its larger blind side footprint gives it excellent performance in thin sheet and non-metallic applications.



E-Nut® Captive Blind Fasteners

BLIND NUTS

Blind nuts are self-wrenching, self-locking nuts that install through the hole in the structure from the bolt side. A press nut is a versatile blind nut style that is used in a variety of applications including wet wing panel attachment. PCC manufactures a broad range of press nuts in both stainless and alloy steel in open and capped styles.

SOLID RIVETS

Solid rivets are high-strength fasteners used in aircraft shear joint structural assemblies. PCC manufactures a broad selection of solid rivets including the CherryBUCK® line of titanium rivets.

PANEL FASTENERS

PCC produces a broad range of structural panel fastener systems to fulfill almost every application requirement including high vibration, variable grip length, composite installation, curved surfaces, misaligned holes, and high cycle use. The products are available with external or internal threads and non-exposed working components in both unified and metric sizes.

AVILOK® structural panel fasteners combine a unique ratchet design with quad lead threads for quick installation and removal plus a positive lock for use in severe vibration conditions.

E-Nut® is a top-down, flush fit, captive blind fastener designed to provide installation time and weight savings over clip nuts in floor and wall installations. The product is water tight, satisfies flotation requirements, and accommodates a variety of material types and depths including composite materials.

Series 3000® fasteners incorporate a unique locking device designed for structural doors and panels that are frequently removed and replaced. The system features positive hold out of the sleeve bolt and hole lining to eliminate panel dimpling.



Solid Rivets

PRELOAD INDICATING WASHERS

PCC developed Preload Indicating Washers to provide a more accurate bolt preload indication than can be achieved with torque tightening and a torque wrench, thus allowing designers to specify a higher bolt preload. The washers are available in under nut and under bolt head standard and oversize configurations for stress levels between 80 ksi and 260 ksi.

FASTENERS FOR SANDWICH STRUCTURE

PCC inserts are potted or mechanically installed in sandwich material, like honeycomb, to allow fabrication of aircraft interior secondary structure including stow bins, galleys, and lavatories. Insert types include threaded or non-threaded, through or blind, locking or non-locking. Floating inserts feature a nut component that can move to compensate for screw misalignment.

Our line of spacers includes one piece and two piece plug and sleeve designs for use in structural applications such as aircraft floors.



Fasteners for Sandwich Structure



MECHANICAL HARDWARE



Locking and Support Systems

- BALL-LOK® PINS
- LATCHES:**
- ADJUSTABLE KEEPERS
- FLUSH LEVER
- HINGES
- HOOK
- PRESSURE RELIEF
- QUICK CHANGE TRACK LOCK SYSTEM™
- ROTARY
- SHEAR PIN & SLIDE BOLTS
- STRUTS:**
- END FITTINGS
- FIXED LENGTH
- TELESCOPING
- SCISSOR/FOLDING
- AEROENGINE COMPONENTS:**
- BEARING SUPPORTS
- COMPRESSOR COMPONENTS
- TURBINE LOCK PLATES
- FITTINGS:**
- AN/AS/ASNA/EN/MS/NAS/NSA STANDARDS
- BEAM SEAL
- FLARED/FLARELESS
- FLEXMATE®
- INTERNAL/EXTERNAL SWAGED
- MFS™
- PERMASWAGE®
- PERMALITE®
- RING LOCKED

PCC's mechanical hardware product lines include locking and support systems, fluid fittings and connectors, machined brackets, machined shafts, and a variety of other complex, precision machined components and assemblies delivered on a build-to-solution or build-to-print basis.

LOCKING AND SUPPORT SYSTEMS

PCC offers both application specific and vendor standard solutions to a wide range of aircraft locking and support requirements including both structural and aircraft interior solutions.

LATCHES AND KEEPER ASSEMBLIES

Our array of latches and keeper assemblies includes hook, rotary, shear pin and slide bolts, flush lever, pressure relief, adjustable keepers, and hinges. Adjustable features compensate for structure wear.

The Quick Change Track Lock System™ is an easy and complete solution for changing aircraft floor plans. Typical applications of the system include aircraft seats, lavatories, galleys and bulkheads—anything that attaches to seat tracks.

STRUTS AND HOLD OPEN RODS

Designed for structural and flight control actuation applications as well as to keep doors, drawers, aircraft maintenance access panels, and cowlings open, PCC's struts and rods come in fixed length, telescoping, swaged, scissor-folding, and special configurations. Available with secondary locking features, these products are designed for tension and compression applications.

BALL-LOK® PINS

Ball-Lok® Quick Release Pins, also called safety pins and pip pins, are used in place of nuts and bolts wherever quick or frequent assembly or disassembly is required. Typical Ball-Lok® pin applications include airline seat back locks and overhead luggage bins. We manufacture the Ball-Lok® line to meet MS, NAS, and tailored customer specifications.

PRECISION MACHINED COMPONENTS

PCC has extensive experience supplying both rotationally symmetrical and prismatic engine and structural components and sub-assemblies in all aerospace materials including high-alloyed steels, stainless steels, high-temperature-resistant steels, and titanium.

AERO ENGINE COMPONENTS

PCC manufactures a variety of critical engine components from hard metals such as front bearing supports, parts for the low-pressure compressor, and turbine lock plates.



Landing Gear Components

LANDING GEAR COMPONENTS

We manufacture stainless steel pins, locking rings, and other components for landing gear undercarriages.

WING LEADING EDGE ROLLER ASSEMBLIES

Produced as a ship set, PCC manufactures aluminum roller assemblies with phosphor/bronze bushings for movable leading edges.



Wing Leading Edge Roller Assemblies

LARGE SHAFTS

PCC manufactures shafts up to 30 inches in length and up to 4 inches in diameter, with tolerance capabilities to $\pm .002$ inch. Materials include Inconel® alloy 718, MP159®, MP35N®, Waspaloy®, Rene® 41, Hastelloy®, A286, 422, H-11, 4340 and 8740.

FLUID FITTINGS AND CONNECTORS

PCC designs and manufactures a broad range of fluid fittings, connectors, and installation tooling for all types of systems, environments, and end user needs.

METALLIC FITTING SYSTEMS

PCC manufactures inch and metric fluid fittings using externally swaged, internally swaged, beam seal, flared, and flareless designs suitable for hydraulic, pneumatic, ECS and fuel systems. Products include a full range of AN/MS/NAS standards, OEM source controlled designs, and ring locked boss adapters and self-locking nuts for high vibration environments.

FUEL, AIR, INERT GAS, AND DRAIN TUBE CONNECTORS

In addition to standard connectors, PCC offers two unique technologies.

Make from Solid Technology™, MFS™ lowers cost by eliminating welds and associated inspections and reduces part weight by allowing for constant, minimum wall thickness in complex shapes.

FleXmate® expanded through-wall fittings increase routing efficiency and reduce cost and weight by eliminating fasteners and associated structural pad-ups and by allowing more lines to pass-through a given area.

MFS™ Tube Connectors



Hydraulic Fittings



Ring Locked Boss Adapters



FleXmate® Expanded Through-Wall Fittings



Aero Engine Components

ENGINEERED RODS

To date, PCC has designed more than 5,000 rod and wire rope cable assemblies, plus many of their end fittings.





COMPONENTS

- FORCEMATE®**
- FORCETEC®**
- TUKLOC®**
- FLEXMATE®**
- SPLIT SLEEVE
COLD EXPANSION™**
- TOOLING**

PCC's capability in structural components includes the design, test, and manufacture of fatigue life enhancing components for structural assembly and sustainment, as well as build-to-print capability in large structural assemblies.



Hole Cold Working and Fastening Systems

HOLE COLD WORKING AND FASTENING SYSTEMS

For over 50 years, PCC has been the leader in the science of hole cold expansion to induce beneficial residual stresses to improve the fatigue life and damage tolerance properties of holes and joints in metallic aircraft structures. The cold expansion process has further been adapted for installation of bushings, fasteners, and fittings in metallic and composite structure to also reduce manufacturing and maintenance flow-time and cost. We produce the complete line of hole cold expansion tooling, bushings, fasteners, and other products that utilize the cold expansion method.

The ForceMate® installation method for cold expanding a bushing into a hole is a commonly used system for performance critical joints including the attachment of aircraft wings, tailplanes, engine and weapons pylons, flight controls, landing gear, and helicopter rotors. ForceMate® provides a lower cost installation method for bushings and has been proven through years of testing and in-service history to enhance the fatigue life and damage tolerance of bushed installations. The system also offers superior resistance to corrosion, vibration, and bushing migration under applied loads.



Aircraft Repair Solutions

PCC cold expanded products are the basis of hundreds of Service Bulletins and Technical Orders for aircraft repair solutions. Products such as ForceMate® bushings are used for in situ repairs to avoid major structural or component replacement and ensure rapid return of aircraft to service.

ForceMate® Bushings

ForceMate® Cold Expanded Bushings

The ForceMate® system uses the proven science of cold expansion as an alternative to shrink or press fit installation methods. Use of this revolutionary technology results in enhanced fatigue performance and reduced installation cost.



ForceTec® Cold Expanded Rivetless Nut Plates

ForceTec® is a unique method of installing an innovate and cost effective rivetless nut plate. The system radially expands a retainer into a hole and is designed to be permanent. This simple installation significantly reduces labor and maintenance over the life of the aircraft.



ForceTec® Rivetless Nut Plates

TukLoc® Cold Expanded Blind Fasteners

The first mechanically attached blind fastening system for use in primary and secondary structures, utilizes a blind nut that is installed into the aircraft structure using FTI's state of the art cold expansion process.



TukLoc® Blind Fasteners

FleXmate® Advanced Aerospace Fittings

This advanced fittings system is flexible in its uses - from fuel and gasses to hydraulics, electrical and drain fittings. The cold expansion process provides design flexibility, structural durability, saves weight, and reduces production and maintenance costs.



FleXmate® Expanded Through-Wall Fittings

Split Sleeve Cold Expansion™

Split Sleeve Cold Expansion system is a cost effective solution to problems associated with fatigue cracks in holes in metal structures. Accomplished by pulling a tapered mandrel, pre-fitted with a lubricated split sleeve, through a hole in aluminum, steel, or titanium. The process works by imparting beneficial compressive residual stress around the hole.

INDUSTRY STANDARD TOOLING

Just as important as the flying product is the installation tooling. PCC offers a complete range of manual, electric, hydraulic, and pneumatic tooling systems for the installation of its products. Many of the tooling systems have become industry standards that can be found almost anyplace an aircraft or engine is being manufactured or repaired.





REFERENCE & CONTACT INFO

QUICK-REFERENCE PRODUCT GUIDE

PCC has been designing and manufacturing fasteners and precision components for over 100 years. We've listed some of the most common fastener and precision component types below, but the configurations that we produce are endless. If you do not see what you need, chances are we either already make it or can make it. Please refer to our website to search fasteners and precision components or call us for guidance with your application or procurement need.

Adjustable Diameter Fasteners

Ball-Lok® Pins

- Cables
- Chains
- Detent pins
- Lanyards
- Receptacles
- Rings
- Single and double acting pins
- Streamers

Blind Bolts

- MAXIBOLT®
- MAXIBOLT® PLUS

Blind Rivets

- Cherry 1900®
- Cherry SST®
- CherryLock®
- CherryMAX®

Bolts and Screws HEAD STYLES

- 100 degree flush
- 10-point
- 12-point, tension & shear
- 82 degree flush
- Brazier
- Button
- Connecting rod
- D
- Eccentric
- Fillister
- Flat
- Hex
- Hook
- Pan
- Protruding
- Socket head cap
- Spline, tension & shear
- Square
- T
- Tapered
- Tee
- Washer

Bolts and Screws (cont.)

OTHER FEATURES AND CLASSIFICATIONS

- Captive screw
- Certified socket head cap screw
- Cupwasher
- Drilled head
- Drilled shank
- Dual wrenching
- Lightening hole
- Machine screw
- Port hole
- Set screw
- Shoulder screw
- Tapped hole

RECESS DRIVES

- ACR PHILLIPS®
- ACR TORQ-SET®
- Cross slot
- Cruciform
- Dovetail
- Frearson
- Hi-Torque®
- MORTORQ®
- Offset cruciform
- PHILLIPS®
- Radial slot
- Socket
- Square socket
- Straight slot
- TORQ-SET®
- Torx®
- Torx Plus®
- Tri-slot
- TRI-WING®

Bushings

- ForceMate®

Expandable Diameter Fasteners

Hard Chrome Bolts & Replacements

Hole Cold Working Systems

Hook Bolts

Hydraulic Fittings

- AN/MS/NAS standards
- Beam seal
- Axial swage PERMALITE®
- Radial swage PERMASWAGE®
- Flared
- Flareless
- Internally swaged
- Ring locked

Latches and Keeper Assemblies

- Chassis latches and keepers
- Flush and push button latches
- Folding handles
- Hinges and inspection plates
- Hook latches
- Keepers and eyebolts
- Overhead baggage-rack latches
- Pawl latches
- Pressure relief latches
- Rotary latches
- Shear pin & slide bolt latches

Lockbolts

Nuts

6-WING NUTS

ANCHOR NUTS

- Clip nut
- Close structural tolerance
- High float
- Self-sealing
- Ultra high float

BARREL NUTS

BEARING LOCKNUTS

- STA-LOK®

BLADE LOCKS

BLIND NUTS

- Press Nut
- TukLoc®

Nuts (cont.)

CAP NUTS

CLINCH NUTS

DOME NUTS

GANG CHANNEL

- Circular
- Radius
- Straight

LOCKING LUGS

PLATE NUTS

- ForceTec®
- Riveted
- Rivetless
- RNP®

SHANK NUTS

SWAGE NUTS

WRENCHABLE NUTS

- 12-point
- Bearing retainer
- Cap
- Castellated
- Castle
- ESNA® locknuts
- FLEXLOC® locknuts
- GREER® locknuts
- Hex
- Non-metallic insert nuts
- Self-aligning
- Slotted
- Spanner
- Spline

Panel Fasteners

- AVILOK®
- E-Nut®
- MILSON®
- SERIES 3000®

Pin Fastening Systems

- Hi-Lite®
- Hi-Lok®
- Hi-Tigue®

Retainer Bolts

Sandwich Panel Inserts

Self-Retaining Bolts

- Circular spring
- Impedance
- Pawl
- Positive lock
- Thread end release

Sleeved Fastening Systems

- SLEEVbolt®
- GromEx®

Solid Rivets

- CherryBUCK®
- Cherry E-Z BUCK®
- Cherry Hollow End E-Z BUCK®

Special Thread Forms

- Symmetric threads
- TRU-FLEX® prevailing-torque locking feature

Struts and Hold Open Rods

- End fittings
- Fixed length struts
- Scissor/folding struts
- Telescoping struts

Studs and Inserts

- Engine studs
- Floating inserts
- Ringlok studs and inserts
- Staked studs and inserts
- Swaged studs and inserts

Tapered Shank Bolts

- TAPER-LOK®

Tube Connectors

- MFS™
- FleXmate®

Washers

- Countersunk washers
- Flat washers
- Preload indicating washers
- Self-aligning washers

Learn more at
PCCFasteners.com

This table includes the main product groupings manufactured by PCC Airframe Products companies. Complete contact information can be found on the back cover of this brochure.

	NORTH/SOUTH AMERICA											EUROPE		ASIA						
	Air Industries Company	Airdrome Precision Components	Avibank Mfg., Inc.	AVK	Cherry Aerospace	Faber Enterprises	Fatigue Technology	Metalac SPS Industria	PB Fasteners	Permaswage, USA	SPS Technologies – Greer Stop Nut	SPS Technologies – Jenkintown	SPS Technologies – Santa Ana	Shur-Lok Company	University Swaging	KaliStrut	Permaswage, Europe	Shur-Lok International	SPS Technologies – T.J. Brooks	SPS China Co., Ltd.
ANCHOR NUTS													X							
BALL-LOK® PINS / QUICK-RELEASE PINS			X																	
BARREL NUTS											X		X					X		
BEARING LOCKNUTS											X		X					X	X	
STA-LOK®													X							
BLADE LOCKS/LOCKING LUGS											X								X	
BLIND BOLTS			X		X															
BLIND NUTS						X						X								
BLIND RIVETS					X															
BOLTS & SCREWS	X			X				X	X			X	X							X
Certified Socket Head Cap Screw												X								X
MS/NAS/NA/AN Standards	X			X				X	X			X	X							X
BUSHINGS						X														
CLINCH AND SWAGE NUTS													X							
EXPANDABLE/ADJUSTABLE DIAMETER FASTENERS			X											X				X		
EXTERNAL SWAGED FITTINGS										X							X			
Radial Swaged Fittings										X							X			
Axial Swaged Fittings										X							X			
DME Fittings										X							X			
GANG CHANNEL NUTS													X							
HARD CHROME BOLTS & REPLACEMENTS																				
HOLE COLD EXPANSION SYSTEMS						X														
HOOK/RETAINER BOLTS											X									
HYDRAULIC FITTINGS		X			X									X						
AN/MS/NAS		X			X															
Ring Locked Hydraulic Fittings					X									X						
LATCHES AND KEEPER ASSEMBLIES			X																	
LOCKBOLTS	X			X							X									X
LOCKNUTS										X	X	X	X					X	X	
PANEL FASTENERS			X										X							
Avilok®			X																	
E-Nut®			X																	
Milson®			X																	
PIN FASTENING SYSTEMS	X							X					X							X
PRELOAD INDICATING WASHERS											X									
RIVETLESS NUT PLATES					X		X													
ForceTec®					X		X													
RNP®					X															
SANDWICH INSERTS													X					X		
SELF-RETAINING BOLTS			X									X	X							X
SHANK NUTS												X								X
SLEEVED FASTENING SYSTEMS						X		X			X									
GromEx®						X														
SLEEVBolt® and Nut								X			X									
SOLID RIVETS					X															
SPECIAL THREAD FORMS												X								
STRUCTURAL ASSEMBLIES																				X
STRUTS AND HOLD OPEN RODS			X												X	X				
STUDS AND INSERTS				X									X	X						
Engine Studs													X							
Ringlok Studs & Inserts														X						
TAPER-LOK® BOLTS								X			X	X								X
TUBE CONNECTORS		X			X	X														
Flexmate®					X	X														
MFS™		X																		
WASHERS											X	X								
WRENCHABLE NUTS								X		X	X	X								X

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- 2 **Airdrome Precision Components**
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www.pccfluidfittings.com
- 3 **Avibank Mfg., Inc.**
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- 4 **AVK**
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- 6 **Faber Enterprises**
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- 7 **Fatigue Technology**
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