HP Air Product line for Defence & Marine Applications
FF began 20 years ago as a specialty forging company providing custom technical solutions in specialty materials to solve our clients most demanding requirements. We have since expanded our areas of operation, but all are under-pinned by our core expertise in material sourcing, precision manufacturing, advanced quality controls and the delivery of technically superior, forward looking custom solutions in exotic materials.

We pride ourselves in our customer service and sterling reputation in the market. We are an ISO 9001:2008 certified manufacturer as well as AS 9100 Rev C, ASME U-Stamp, and OHSAS 18001 approved. We have over 250,000 square feet of manufacturing facilities around the globe.

**Our sub-units, JVs and collaborations include:**

- **FFPL (Flash Forge Private Limited)** Custom solutions for Power, Marine, Aerospace and Defence
- **FF Coyard** Custom valves for critical application
- **FF Process Equipment** Custom fabrication of Heat Exchangers, Piping, and Pressure Vessels.
- **FF Composite Resin Developments (CRD)** Industry leading composite fittings, valves, pumps and custom solutions
- **FF Optimal Armour** Premiere composite anti-ballistic solutions
- **FF USA** Bringing our products to the Americas
- **Nereides** Supply and maintenance of buoyant cable antennae

FFPL provides custom technology solutions to clients in the Power, Marine, Aerospace and Defence sectors. FFPL is an integrated manufacturer of a wide range of valves and end fittings. We design, manufacture, and supply innovative products of the highest quality through our extensive in-house capabilities, which include conceptual engineering practices, design, rigorous quality control, type testing, and reverse engineering. FFPL has designed and manufactured many different types of valves and fittings specifically for high pressure air applications.
Flash Forge Private Limited serves a diverse global market space for Defence & Marine Applications.
Range Of Marine Application Products

High Pressure Air Valves & Fittings

FFPL manufactures a wide range of products suitable for High Pressure Air applications. These versatile products are:

- Suitable for all marine and industrial applications.
- Available in Nickel-Aluminium-Bronze (NAB) construction. MOC for other materials available on request.
- Designed for orifice diameter ranging from 6NB to 40NB sizes.

Balanced Stop Valves

- Self balance type.
- Requires minimal operating torque.

Technical Data

- Max working pressure – 320 bar.
- Manual valve with position indicator.

Balanced Stop & Release Valve

- Self balanced type with pressure release option.
- Suitable for fitment in guage pressure line.

Technical Data

- Max working pressure – 320 bar.

HP Air Non Return Valves

- In line Peek seated non return valve.
- Efficient flow path and assured parallelism between end connections.

Technical Data

- Max working pressure – 320 bar.
- Customized end fittings.
**HP Air Regulators**
- FFPL manufactures Dome loaded single and double stage Pressure Regulators.
- Designed to provide accurate pressure control over a wide range of HP air application.

**Technical Data**
- Inlet pressure – max 200 bar.
- Output pressure – 0 to 200 bar.
- Integrated relief valve with customized end fittings.

**Pressure Reducing Stations**
- Single stage PRS specially designed for Control Air system for different systems fitted onboard naval warship.
- Similar PRS may be designed as per customer requirement.

**Technical Data**
- Inlet pressure – max 200 bar.
- Output pressure – 10/20/100 bar.
- Maximum flow rate.

**Material**
- Valves & fittings - Nickel-Aluminum-Bronze (NAB).
- Piping – Cu / Cu-Ni/ SS 316L
- Mounting panel – Stainless Steel.

**HP Air Filters / Strainers**
- Available as In Line and Y -type construction.
- Designed for filtration through Sintered Bronze in both the variants.

**Technical Data**
- Max working pressure – 280 bar

**High Pressure Air Fittings**
- Wide range of end fittings manufactured to suit customer requirements.
- Suitable for both low and high pressure applications.

**Technical Data**
- Types – Straight Adaptor, Swivel Adaptor, Branch Adaptor (Tee, Cross), Union, Bulkhead coupling, Reducers and Elbows.
**High Pressure Skids**

- FFPL has designed and manufactured a number of varied HP Air Skids / panels for the defence sector.
- These skids are suitable for diverse range of applications which includes Weapons Control, Diesel Alternator starting, Diving support, STP, Fresh Water system etc.
- Customised skids may be developed as per request.

**Technical Data**

- HP Air Control panel with variable output.
- Max inlet pressure – 200 bar
- Outlet pressure – 0 to 200 bar.
- SS 316L piping and end connections

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**Special Application High Pressure Air Valves**

FFPL has designed and manufactures a number of HP air valves for special applications in the Defence sector. These valves were custom designed to meet the critical requirements of the system application.

**By Pass Valve**

- High pressure air 3 way By Pass valve was designed for the Weapon Launching system fitted onboard naval submarines.
- Similar By Pass valve may be designed as per customer requirements.

**Technical Data**

- Max working pressure – 380 bar.
- Orifice size - 20NB.

**Material**

- Nickel-Aluminum-Bronze (NAB).

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**3 Way Air Charging Valve**

- HP Air Charging valve designed for Gas Turbine Engine starting system onboard naval warship and weapon launching system in submarines.
- Design may be modified to suit specific requirements.

**Technical Data**

- Max working pressure – 380 bar.

**Material**

- Nickel-Aluminum-Bronze (NAB).
Automatic Air Control Valve

- High pressure Air Control valve designed for Weapon launching system in submarines.
- Design can be suitably modified for different HP air applications.

Technical Data

Max working pressure – 380 bar.

Material
- Nickel-Aluminum-Bronze (NAB).

Hull and Inline Valves and Fittings

FFPL manufactures bronze and nickel-aluminum-bronze (NAB) gate, globe, ball and check valves for seawater service for marine application. These valves are also suitable for oil and gas, water treatment and chemical industries. Our standard valve range is available with a wide range of trims and end connections.

Gate Valve

- Supplied for sea water system onboard ships & submarines.
- Designed for Class 150 and Class 300 pressure ratings.

Technical Data

- Available in metal to metal and metal to soft seated variants.
- Size – 25mm to 150mm with flanged or threaded end connections.

Material
- Titanium and Nickel-Aluminum-Bronze (NAB).

Globe Valves

- SDSL and SDNR Globe valves available with additional features like Rising, non-rising Stem and angle type.
- Designed for Class 150 and Class 300 pressure ratings.

Technical Data

- Available in straight type, flanged or threaded end connections.
- Sizes – 25mm to 150mm
- Available in metal seat and soft seat versions.

Material
- Titanium and Nickel-Aluminum-Bronze (NAB).
**King Valve**

- Screw down valve suitable for sea water applications onboard ships and submarines.

**Technical Data**

- Max working pressure – 15 bar.
- Sizes – 25mm to 150mm in flanged connections.

**Material**

- Titanium and Nickel-Aluminum-Bronze (NAB).

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**Ball Valve**

- Available in two and three piece design with range of trim material.
- Available with end connections like press to connect, threaded, solder or flanged.

**Technical Data**

- Suitable for operation in pressure rating Class 150, 300 and 600.
- Sizes – 15mm to 150mm NB.

**Material**

- Bronze, Brass, Carbon Steel and Stainless Steel.

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**Marine Strainers**

- FFPL manufactures Basket type strainers for marine applications.
- Other types of strainers suitable for industrial applications may be designed as per requirement.

**Technical Data**

- Operating pressure upto 20 bar.
- Sizes – 50mm to 200 mm NB.

**Material**

- Titanium, Carbon steel, SS etc as per customer requirement.
**Special Application Valves**

FFPL has designed and manufactured valves for special application in the defence sector. The valves were specially designed along with actuator units to suit the customer requirement.

**Hydraulic Actuated Valve**
- Hydraulic actuated marine globe valve designed for sea water system onboard naval submarines.
- The fitting is provided with hydraulic actuator for remote operation.
- Similar actuated valves may be designed and delivered as per customer requirement.

**Tailor Made Fittings For Navy**

FFPL has manufactured special application fittings and equipment for the defence sector. These fittings were tailor made as per the design specification of the customer.

**Combat Ventilation Head**
- Pneumatic actuated Combat Ventilation Head designed for ventilation system onboard naval ships.
- The fitting is designed to provide air tight sealing and tested above atmospheric pressure.
- The steel fitting consists of a mushroom head assembly fitted with a pneumatic actuator for remote operation of linkage assembly.

**Hydraulic Manipulator**
- 5/3 Way hydraulic solenoid valve developed for the hydraulic system operating the Helicopter Hanger Hatch assembly onboard naval ships.
- Designed in Aluminum alloy for operating pressure upto 260 bar.
- The manifold consists of a 5/3 way hydraulic valve and also has a manual override. Similar multi-functional manifolds may be designed as per customer requirement.
Smothering Tank

- 26 litres Smothering Tank was designed and manufactured for the Helo Hanger Fire Fighting system onboard naval warship.
- The tank was made of Aluminum alloy and made corrosion resistive by Hard Anodising.

Supply of Indigenised Products for Submarines

FFPL is proud to be the first company in India to be qualified by DCNS SA, France for the Scorpene submarine program. We have indigenized, manufactured and supplied various mechanical equipment for the Scorpene type submarines. In addition, we also manufacture and supply critical products for EKM and SSK class submarines.