

# DEFENSE

**GLOBAL SOLUTIONS** 





## **EXCELLENCE IN FLOW CONTROL**

A NAVY'S MISSIONS MAY CHANGE. But service through war and peace requires one constant – your ships and equipment must perform at all times, regardless of the conditions. Mission-critical is your way of life.

CIRCOR understands the challenges you face. And whether your application requires an engineered pump, a customized solution or turnkey module, we are on board to meet your needs. From the flight deck to the engine room, from the superstructure to gun turrets, our products and expertise are found globally, operating reliably 24/7.

Navies and military installations worldwide have placed their confidence and trust in CIRCOR for over 70 years because we have delivered without fail through:

- > People who bring the engineering expertise, problem-solving orientation and commitment to deliver innovative fluid handling and fluid transfer solutions that tackle your toughest challenges, the first time, every time.
- > Products and systems that deliver a wide range of solutions to meet your demanding and exacting specifications, whether you need a custom engineered system or a plug-and-play package module.
- > Dedication to global service and support that means we are there wherever and whenever you need us, with service centers located in the United States, India and France.

**Bottom line:** Mission-critical is our way of life, too. CIRCOR is the single source for your navy-specific solutions as we redefine what's possible in defense solutions fluid handling.

# PEOPLE WHO MAKE THE DIFFERENCE FOR NAVAL OEMS AND END USERS

It's not just our product experience and knowledge but the passion to help you succeed that differentiates CIRCOR.

- > For OEM and naval engineers, we collaborate with your team, designing innovative system solutions on both new builds and upgrades of existing ships.
- > For end users in the navies of the world, we deliver turnkey plug-and-play packages, along with expert guidance and ongoing service and support.

Either way, we're ready to help you take on the most difficult challenges, with a broad portfolio of products, in-depth application experience and understanding of naval specifications.



### YOU CAN COUNT ON CIRCOR

#### FROM START TO FINISH

PROJECT REVIEW – Decades of naval experience qualify our professionals as your trusted partners. Our experts closely collaborate with you to determine the needs of an application. Regardless of whether the project is a new ship design, refit, modernization, or in-service support, we ask questions and search for the best way to help you accomplish what's required.

PROJECT MANAGEMENT AND QUALITY CONTROL – Project managers oversee your project at key milestones to ensure that your strict timelines are met. Quality control experts help you guide your project every step of the way, from design and manufacturing through delivery.

GLOBAL ENGINEERING EXPERTISE – With our worldwide locations, technical support is never far from you. We use complex computer modeling to ensure that the solutions we provide match your specifications.

#### GLOBAL MANUFACTURING -

Manufacturing professionals and stateof-the-art production equipment deliver products built to exceed your expectations with brands such as Allweiler®, Imo®, Tushaco® and Warren®. TESTING AND VERIFICATION – Dedicated and specifically designed test facilities are the proving ground at which your products and systems must pass muster before delivery.

LOGISTICS CONTROL – Worldwide delivery means just that – we ensure your equipment's safe arrival on time, every time.

EDUCATION AND TRAINING – On-site training provides your experts with the know-how and confidence you require to keep your installations online. Through frequent naval personnel changes, CIRCOR experts provide consistent knowledge and background to your teams.

POST-INSTALLATION SUPPORT – In dock or at sea, we provide unequalled support. That means that critical naval applications, such as firefighting, are addressed on your schedule, at your convenience.



# PRODUCTS THAT FOCUS ON PERFORMANCE & RELIABILITY

Because of the quality we build into our pump packages and systems, valves and actuators, OEMs and the navies of the world feel confident, assured in the reliability of their CIRCOR products. We develop solutions that reduce maintenance costs, energy costs and avoid unscheduled downtime and repairs. And we focus on performance and unsurpassed reliability.

We engineer and build products for your critical applications, including:

- > Fire main pump skids
- Aircraft fuelling systems
- > Lubrication equipment and skids
- > Hydraulics
- > Engine room
- Water transfer



#### **SUPERSTRUCTURE**

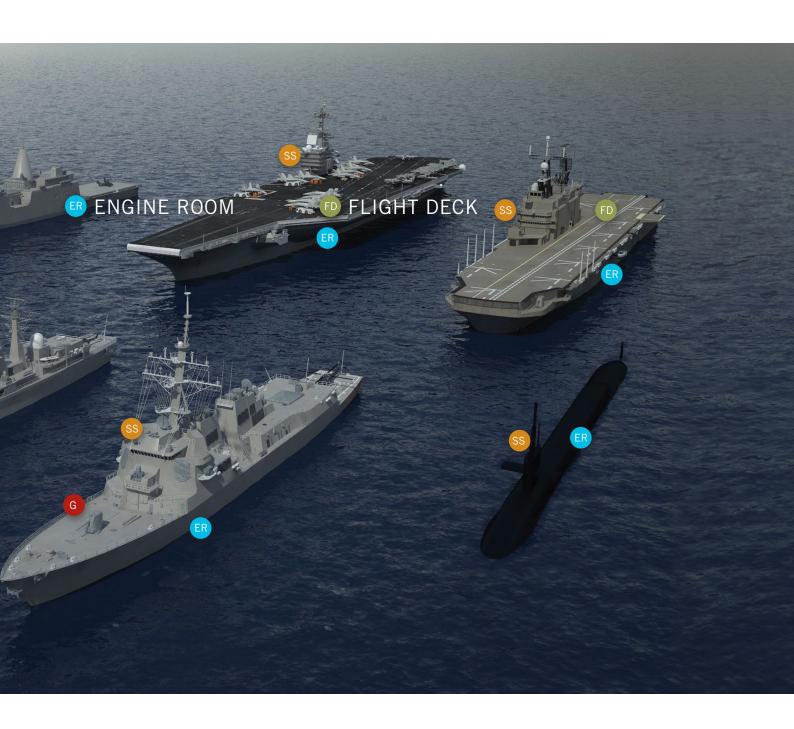


#### FLIGHT DECK



- > Hydraulics
- > Air conditioning
- Water transfer

- > Aircraft fuel transfer
- > Firefighting
- > Wash down
- Deluge
- > Hydraulics



#### **ENGINE ROOM**

- Ballast
- Cooling water (sea & fresh)
- Hot-water circulation
- > Fuel & lubricating oil
- > Hydrophore
- Boiler feed

- Sewage & sanitary services
- > General service
- Condensate
- Firefighting
- > Bilge
- Main LO circulation

Gearbox services

Sludge

- > Electric propulsion
- Motor cooling
- > Trim/weight compensation

#### **GUN**



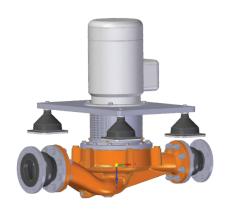
- Firefighting pumps
- > Weapons cooling
- Hydraulics

### **PUMPS**

Your application needs in Defense are diverse, so CIRCOR delivers a variety of pump technologies from the names you know and trust: Allweiler, Imo, Tushaco, Warren. With both standard and highly-engineered designs, we're able to deliver pumps that meet your specific application needs.

- > Flow rates from 1 to 7000m<sup>3</sup>/hr.(3 to 30,000+ USGPM)
- > Pressures up to 200 bar g (3,000 psig)
- > Performance up to 375 kw (500 HP)
- > Materials from cast iron to titanium, including steel, duplex stainless, bronze, Monel®
- Military standards: Products and solutions delivered to meet the various standards including U.S. MIL Spec, DEFSTAN, NES together with the Class Societies Naval rules such as ABS, LRS, DNV and GL
- Special requirements: Customer specific test criteris based on Military standards or customer standards: Capacity - Pressure - Hydrostatic - Suction Lift - Shock Environmental Vibration - Airborne Noise - Structureborne Noise - Liquidborne Noise





#### CENTRIFUGAL PUMPS

#### **TECHNOLOGIES**

Coupled - Close Coupled - Propeller

Mixed Flow - Multistage - Special Low Noise

#### **SERVICES**

Sea Water - Condensate - Heeling - Fresh Water

Distilling Plant - Ballast - Fire - Feed Water

#### POSITIVE DISPLACEMENT PUMPS

#### **TECHNOLOGIES**

Untimed Screw - Timed Screw - Special Low Noise

Gear - Progressive Cavity - Reciprocating

#### **SERVICES**

Lube Oil - Transfer - Fuel Oil - Stripping

Hydraulics - Purifier / Coalescer Feed





### **VALVES & ACTUATORS**

For over 30 years, the U.S. Navy has relied upon products from CIRCOR's Portland Valve, to meet your fluid control needs from isolation valves to advanced smart control valves.

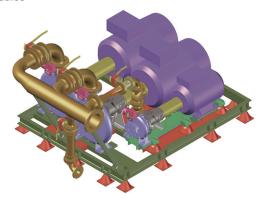
- Highly engineered valves for critical applications on submarine/surface ship damage control systems
- > Specialized control valves
- Programmable motor-operated valves for localized PID or autonomous control
- MIL Spec butterfly valves and electric actuators
- > Motor-operated valves



### **SYSTEMS**

Whether you need a turnkey, plug-and-play pump package or a complete custom engineered system, CIRCOR stands ready to address your toughest application challenges.

- > Helo Refuelling Modules
- Fresh and Sea Water Pressure Sets (Hydrophore)
- > Diesel Driven Fire Sets
- > Lubrication Modules





# AFTERMARKET SERVICES – U.S.

CIRCOR Service and Repair Centers in San Diego, California and Norfolk, Virginia, provide the following equipment support services 24/7/365:

- > Factory-trained and supported technicians
- Stocked parts inventory
- Turnkey repairs
- > Rotatable pool programs
- Factory-engineered upgrades
- Specialized services, such as equipment flushing and training

### AFTERMARKET SERVICES – GLOBAL

- Factory service and repair
- > Factory trained service engineers
- Spare parts inventory

# SUPPORT BEYOND THE CALL OF DUTY

Whether your ship is in port or dry dock, or at sea, CIRCOR is there with you. Global service means just that. We work to minimize downtime, so your ships are always ready when duty calls. But when an emergency occurs, we stand ready too with the support you need. You can count on us to:

- Make sure you have access to the latest technical data and product documentation.
- > Deliver standard spare parts within 48 hours.
- Support you from service centers, located in the United States, France and India.
- Schedule specialized services, such as lubrication equipment flushing and training, at your convenience.

CIRCOR technicians are available "around the clock and around the world," wherever and whenever you need them.





## GLOBAL SUPPORT IN STRATEGIC LOCATIONS

The militaries of the world may differ in mission, but they do share a common challenge: to perform under the harshest conditions, at any time, in any location around the world. That's why CIRCOR has established three centers of excellence in strategic global locations – the Americas, Europe and India – each focused on supporting your critical mission with ours: flawless fluid-handling services whenever and wherever you need them.





# MISSION CRITICAL. IT'S YOUR WAY OF LIFE. AND IT'S OURS, TOO.

CIRCOR shares your commitment to the mission-critical way of life. That's why we're redefining what's possible in global defense, collaborating with you from project inception to installation to on-board service, to provide the:

- In-depth knowledge of naval specifications and of your world to help you deal with the toughest application challenges.
- Quality, innovation and reliability you need from products and systems to help you ensure better performance.
- Global service and support, when and where you need it, to help you deliver on your mission without fail.

Mission Critical. It's the foundation of our commitment to you, every hour of every day.



CIRCOR is a market-leading, global provider of integrated flow control solutions, specializing in the manufacture of highly engineered valves, instrumentation, pumps, pipeline products and services, and associated products, for critical and sever service applications in the oil and gas, power generation, industrial, process, maritime, aerospace, and defense industries.

### **Excellence in Flow Control**

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