MAROTTA

Motion and Flow Controls for Space Systems

UNMATCHED HERITAGE FOR FLOW CONTROLS

For commercial and military spacecraft programs, Marotta Controls offers products with 50 years flight-proven heritage. Our pressurization and control valves played a critical role in the earliest days of manned spaceflight, from the fuel control valves on the Saturn rocket, to propulsion systems for the Lunar Module ascent and descent engines.

Today, our pressurization and propulsion controls provide reliable, cost effective performance without compromise to commercial and military spacecraft.

MAROTTA CONTROLS ENABLES TODAY'S SPACECRAFT AND LAUNCH VEHICLE SYSTEMS

- Engine and Fuel Pressurization Systems
- Tank Pressurization Systems
- Cold and Warm Gas Propulsion Systems
- Electric Propulsion Systems
- Reaction Control Systems
- Attitude Control Systems
- Pneumatic Control Systems
- Hydraulic Control Systems
- Sniffer Leak Detectors
- Exhaust Systems
- Fill and Drain Systems
- Umbilical Retract System - SLC-6
- Water Deluge Systems
- Proportional Control Systems
- Gas Generator Modules
- Experiment Cooling Systems
- Fuel Cells

Fluid Controls for Space Technologies

When it comes to reliable, high-performance fluid controls for space technologies, manufacturers around the world rely on Marotta Controls. Our customized components and sub-systems play a vital role in pressurization systems, thruster controls, reaction/attitude control systems and propulsion systems for commercial and military spacecraft.

THRUSTER VALVES AND CONTROLS

Designed for thruster applications demanding precision attitude, trajectory and orbit control of small satellites and deep space probes, our unique cold gas microthrusters are capable of very low power operation. The resulting low power component provides an order of magnitude reduction in solenoid coil heating.

We're experts with high pressures, corrosive and challenging fluids such as hydrazine, hydrogen peroxide, liquid oxygen and cryogenic temperatures.

CRITICAL APPLICATIONS / EXTREME ENVIRONMENTS

Marotta Controls supplies motor-operated segmented ball valves to control the ammonia heat-transfer fluid on the ISS Active Thermal Control System.

These valves, in several sizes with various features, are externally located on the ISS and are flight-critical to maintain a suitable environment for the astronauts.

MINIATURE CONTROL VALVES

Designed for satellite applications where space and power is limited, these compact, reliable designs can withstand high pressures, thousands of repeated actuations as well as harsh environments and fluids. These quick responding miniature controls are available with or without a latch and can be configured to draw less than 1 Watt peak power.

PRESSURIZATION AND PROPULSION CONTROLS

Our space qualified valves have proven their worth again and again in major space programs from the earliest days of space flight. We design and develop valves for fill, drain, isolation, control and regulation of propellants and pressurization.

THE MAROTTA ADVANTAGE

Marotta Controls is a vertically integrated supplier with systems engineering and advanced manufacturing operations all under one roof. This tight integration between engineering and manufacturing allows us to fine tune all of our designs for cost-effective manufacturability.

NEW APPLICATIONS

NEW PRODUCT DEVELOPMENT

Using our deep base of flight qualified designs our engineers can either specify a previously qualified design for your new application, or develop a modified design with extensive heritage at the component level.

LEAN PRODUCTION CELL / SPECIAL CLEANING

Our advanced in-house assembly and test capabilities are ideally suited to meet the extreme requirements for space-qualified products. Test capabilities range from pneumatic, hydrostatic and hydraulic to environmental and specialty fluids.

Marotta Controls' facility includes environmentally controlled, positive pressure Class 7 cleanroom and Class 5 flow benches with flow hoods. Our capabilities include oxygen cleaning and non-volatile residue testing.

MANUFACTURING AND PRODUCTION

Our state-of-the-art manufacturing, test and assembly operations include five-axis CNC machining centers, CMM inspection, lean assembly cells and a Class 7 cleanroom per ISO 14644. Our offerings include:

- Manufacturing
- Welding Technology
- Surface Technology
- Quality Management
- Assembly, Integration and Test
- Special Cleaning
- Rapid Prototyping

STRICT QUALITY CONTROLS

Strict quality controls are in place throughout our engineering, manufacturing and support operations. Our quality system has been third-party certified to conform to ISO9001:2008 as well as AS9100:2009.

QUALITY SYSTEM CERTIFICATION AS/EN/JISQ 9100:2009 DNV

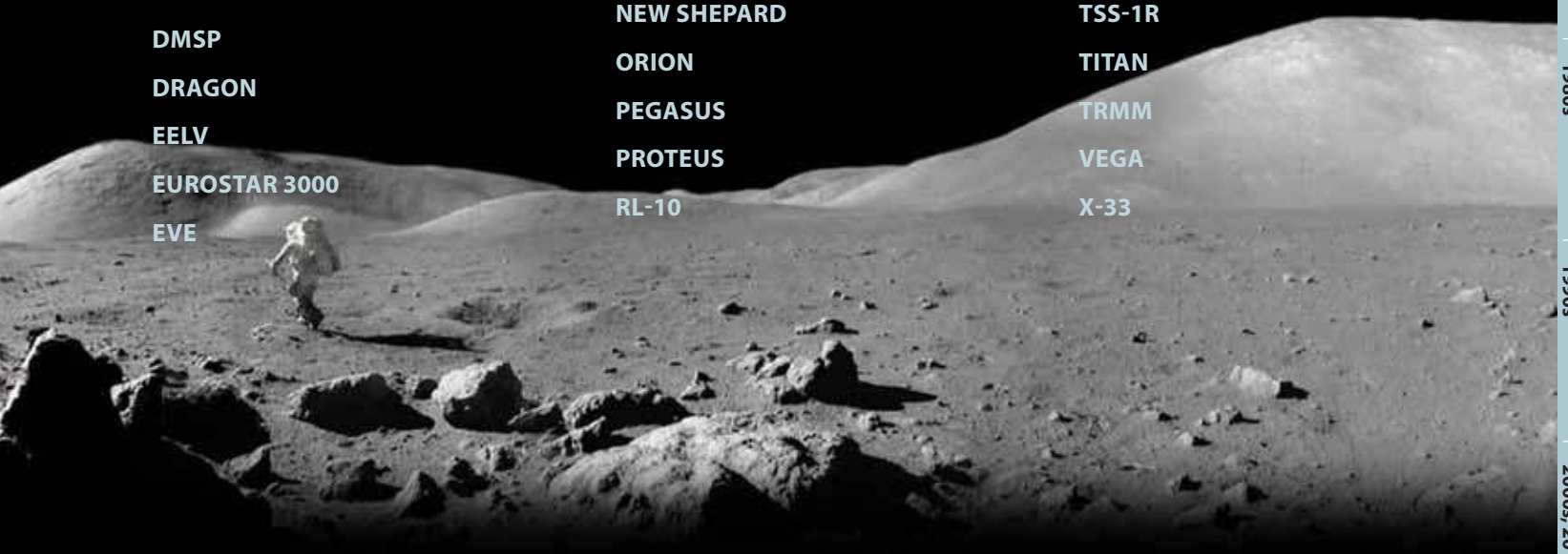
FROM DESIGN TO DELIVERY

Our experienced engineering team designs each component and system for maximum reliability and lifecycle while complying with challenging weight, space and cost constraints. We then work with our customers on every phase of the product development process:

- **Requirements**
- **Preliminary Design**
- **Final Design**
- **Prototypes**
- **Development Units**
- **Qualifications**
- **Production**

KEY SUPPLIER ON OVER 50 SUCCESSFUL SPACE PROGRAMS

AEOLUS
ALPHABUS
ALPHASAT
APOLLO
ARIANE 5
ARTEMIS
ATLAS
ATV
CENTAUR
CRYOSAT
DELTA II, IV
DISASTER MONITORING CONSTELLATION
DMSP
DRAGON
EELV
EUROSTAR 3000
EVE
FALCON 1, 9, HEAVY
GEMINI
GOCE
GX
H2A / H2B
ISS
KIBO
LISA PATHFINDER
LUNAR MODULE
MERCURY
METOP
METOSTAT 2ND GENERATION
NEW SHEPARD
ORION
PEGASUS
PROTEUS
RL-10
ROSETTA
SATURN
SMART-1
SPACE SHUTTLE
SPACEBUS 4000
SPACESHIPONE
SPACESHIPTWO
ST-5
STENTNOR
TAURUS
TETHERED SATELLITE
TIROS
TSS-1R
TITAN
TRMM
VEGA
X-33



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Marotta through the decades…

1940s, 1950s

- Develops rocket engine propellant control valves for the emerging rocket engine industry
- Develops control and APU valves for the X-15 plane, the first airplane in space
- Develops unique balanced poppet concept
- Receives first regulator patent

1960s

- Develops pressurization valves for Redstone and Atlas rockets
- Marotta control valves used for fuel and oxidizer pressurization systems for Mercury, Gemini, and Titan
- Valves used for environmental control systems on Apollo spacecraft and Saturn launch vehicle
- Valves used on the LEM ascent and descent engine

1970s

- Develops electro-hydraulic test system for Space Shuttle fuel tank testing
- Marotta develops and patents over thirty new products for fluid controls
- Supplies hydrazine control valves for the Space Shuttle Solid Rocket Booster

1980s

- Marotta develops electronic closed loop control system for NASA calibration system
- Delivers new electronic control system to NASA/Johnson Space Center
- Supplies Delta II with solenoid and check valves for various applications including fuel tank pressurization

1990s

- Marotta is the first small business to achieve the George M. Low Award for Quality and Excellence
- Marotta becomes the largest privately held supplier of fluid controls on the International Space Station
- Develops new multi-function valve and miniature solenoid for xenon flow control for Snecma PPS1350 Hall Effect Thruster, part of GOCE

2000s, 2010s

- Marotta supplies fuel tank vent valves for Delta IV
- Develops new cold gas microthruster and thrust control electronics for ST-5
- Marotta receives its second George M. Low Award for Quality and Excellence
- Supplies various control valves to the emerging commercial space industry, including Falcon 1, 9, Heavy, New Shepard, SpaceShipOne, SpaceShipTwo
- Supplies solenoid valves for the H2A/H2B launch system
- Qualifies high pressure oxygen latch valve for AEOLUS