



THE LEADING FORCE behind liquids™ since 1857

Power Generation Products

Flow Dividers • Fuel Pumps • Lube Oil Pumps

ROPER PUMP

150 YEARS OF GROWTH AND INNOVATION



In 1889 at age 34, George D. Roper founded the Roper legacy with the purchase of a 50% interest in the Van Wie Gas Stove Company of Cleveland, Ohio. The Gas Stove Works ultimately became his sole property, and in 1894 was entirely destroyed by fire.

Salvaged and rebuilt as the Eclipse Gas Stove Company, the business grew steadily, expanding to include the American Foundry Company in 1901, and the Trahern Pump Company in 1906. Trahern's hand operated well pumps had been helping to build the American dream since 1857.

Within a few years the company was pioneering new pump developments, and becoming a major supplier to the rapidly growing petroleum industry.

In 1919, George D. Roper merged all of his companies into one company named the George D. Roper Corporation. He passed away in 1925, and left the presidency of the corporation to his son, Mabon P. Roper.

The company survived the Great Depression of 1929, and during World War II developed diesel engine lubricating pumps for war plants and naval vessels. They also manufactured projectiles and ammunition boxes.

Mabon P. Roper died in 1942, ending the Roper family line. He was succeeded by Stanley Hobson, who continued the Roper tradition of quality and dependability.

From Legacy to Leadership

The George D. Roper Corporation grew and evolved. They sold the Stove Company in 1957, and renamed the remaining pump portion Roper Hydraulics Inc. In 1959, Roper Hydraulics acquired O.E. Szekely & Co., pump specialists located in Commerce, Georgia, where Roper Pump Company maintains operations to this day.

In 1961, Roper Hydraulics became Roper Industries Inc. Roper Industries became a publicly traded company in 1992 (NYSE symbol: ROP). Roper Pump Company is a division of their Industrial Technology Group.

Today, Roper Pump Company offers its innovation, state-of-the-art technology, quality and value, combined with a tradition of reliability that dates back 150 years.

Invention of Flow Dividers

1948: Our first Roper Pump flow divider was a motor driven linear unit with 10 elements. A gas turbine locomotive manufacturer asked us to develop a fuel delivery system that would help eliminate hot spots caused by uneven delivery of fuel to the turbine combustion cans. A heavy, viscous fuel oil was magnifying differences in fuel oil restrictions. The first flow divider was created to solve that problem.

Six decades later, our designs have stood the test of time. There are Roper Pump flow divider units from the 1950's still in routine operation. Today we are building flow dividers with as many as 20 elements.

1962: The first free wheeling flow dividers were introduced. The use of roller bearings instead of the journal bearings used earlier, along with higher precision parts, decreased starting friction to the point where a motor was not necessary. Now the flow dividers were driven only by the fuel passing through them.

1969: The first Circular Flow Divider was designed. Key benefits included alleviation of fuel temperature problems and close clearances.



1970's: Introduction of larger gas turbines created a need for larger flow dividers. Flow dividers able to handle 400 GPM were created.

1980: Roper Pump Company introduced the first flow divider with stainless steel internals to combat the corrosive effect of sulfuric acid and water resulting from sulfur-rich crude oil being used to operate turbines.

2003: Roper Pump Company introduced DuraFlow™ Corrosion-Resistant Flow Dividers. Stainless steel and bronze construction proved highly resistant to corrosion from entrained water in distillate fuels and fuel-borne particulate contamination. Fuel system reliability was enhanced exponentially.



ISO9001:2000 Certified



Engineered Solutions for Power Generation Applications



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Liquid Fuel Flow Dividers

When you invest in a flow divider from Roper Pump Company, you're gaining six decades of knowledge and experience from the company that invented the technology.

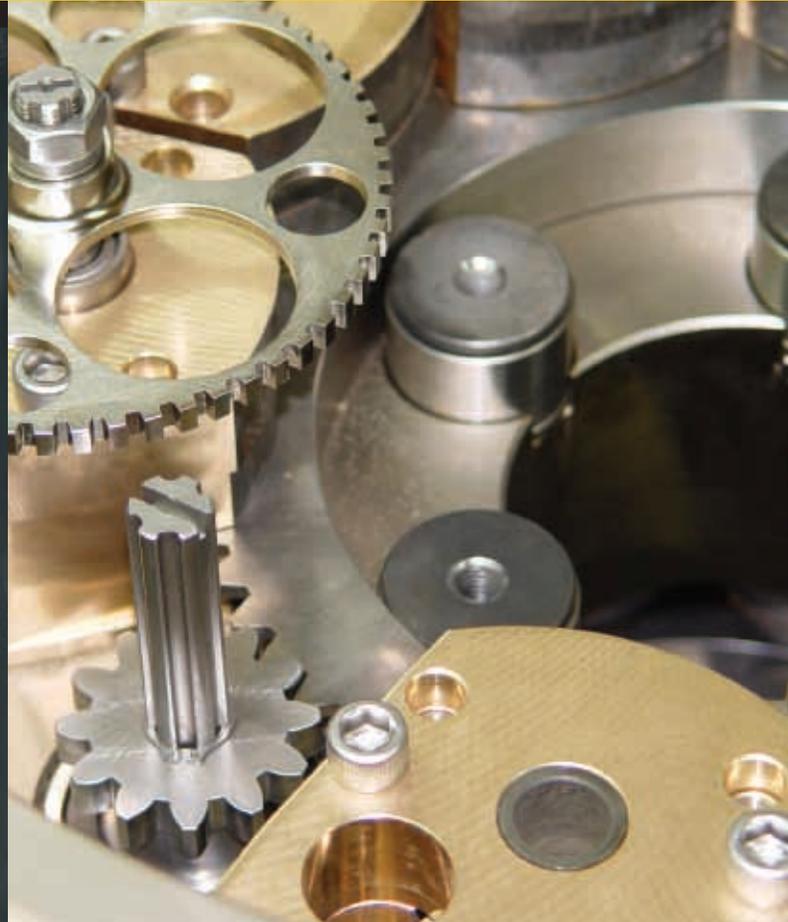
Roper Pump invented the liquid fuel flow divider in 1948. Since then we have continued to make technological improvements in response to changing customer needs. With units installed around the globe, Roper Pump Company continues to build our market leadership with designs that have become the industry standard.

We design and manufacture flow dividers for most sizes of heavy industrial gas turbines. Both linear and circular designs are available, either in standard cast iron, or our proprietary stainless steel and bronze DuraFlow™ design.

Custom Designs

Roper Pump Company flow dividers are custom engineered for your applications. If your liquid fuel system is running anything from naphtha to heavy fuels... we will help you determine the appropriate options for:

- Materials of construction
- Internal clearances
- Magnetic speed sensors
- Starter motor specifications



Fuel and Lube Oil Pumps

Roper Pump Company designs and manufactures heavy duty fuel pumps for gas turbines, with years of combined experience running on distillates, heavy fuels and crude oil, kerosene, and naphtha, with viscosities of 0.5 - 100 Centistokes.

In addition to high pressure fuel pumps, we also manufacture seal oil pumps and lube oil pumps for large engines, turbines, compressors, generator sets, and gear reducers.

Liquid Fuel Flow Dividers

Liquid Fuel Flow Dividers

Flow dividers are used to separate a single larger flow of liquid into multiple smaller flows. Roper Pump Company flow dividers are specifically designed for the electrical power generation field. Our units are connected to industrial gas turbines and maintain equal flows of liquid fuel to all the turbine's combustors.

In general, a flow divider is comprised of a number of precision spur gear pumps that are coupled together in a manner that keeps them rotating at equal speeds. Each one of those pumps is termed "a flow element". In operation, fuel is supplied to an inlet port on the flow divider by a main fuel pump. Once the fuel enters, it flows through a common passage that feeds the inlet sides of all flow elements. The energy contained in the fuel flow causes all the flow elements to rotate simultaneously and function as hydraulic motors.

Since all the gears are virtually the same size and have very little clearance around them, each flow element meters out an equal flow of fuel from its discharge sides as it rotates. Piping attached to the discharge port of each element then conveys these equal fuel flows to the combustor nozzles of the turbine.

STANDARD CAST IRON FLOW DIVIDERS

Application	Figure	Flow Rate (GPM)	Number of Elements	Fuel Type	Materials	Design
Frame 3	20352	100	6	Naphtha	Cast Iron	Linear
Frame 3	20168	20	6	Naphtha	Cast Iron	Linear
Frame 5,6B	20288	34-70	10	Naphtha, Heavy	Cast Iron	Linear
Frame 5,6B	20091	34-70	10	Distillate, Heavy	Cast Iron	Linear
Frame 6B	20313	70	10	Naphtha, Distillate	Cast Iron	Circular
Frame 6F	20337	120	6	Distillate	Cast Iron	Linear
Frame 7B	20119	120	10	Distillate, Heavy	Cast Iron	Circular
Frame 7E	20095	160	10	Distillate, Heavy	Cast Iron	Circular
Frame 7F	20336	270	14	Distillate	Cast Iron	Linear
Frame 9E	20103	170	14	Naphtha, Distillate	Cast Iron	Circular
Frame 9E	20329	210	14	Naphtha, Distillate	Cast Iron	Circular
Frame 9F	20250	355	18	Distillate	Cast Iron	Circular
251B12	20173	100	8	Distillate	Cast Iron	Linear
251B12	20305	20	8	Distillate	Cast Iron	Linear
251B12	20296	100	8	Distillate, Heavy	Cast Iron	Circular
501D5	20127	180	14	Distillate, Heavy	Cast Iron	Linear
501D5	20277	35	14	Distillate	Cast Iron	Linear
501F	20247	225	16	Distillate	Cast Iron	Circular
501F, 501G	20136	206	16	Distillate	Cast Iron	Linear
501F, 501G	20306	40	16	Distillate	Cast Iron	Linear
501G	20334	300	16	Distillate	Cast Iron	Linear
701F	20325	260	20	Distillate	Cast Iron	Linear
701F	20324	60	20	Distillate	Cast Iron	Linear
M501F, M501G	20136	210	16	Distillate	Cast Iron	Linear
M701D	20290	100	18	Distillate	Cast Iron	Linear
M701F	20325	260	20	Distillate	Cast Iron	Linear



Linear Flow Dividers

Linear flow dividers are constructed of flow elements that are attached together in a row and linked internally by intermediate coupling shafts. These units can be mounted horizontally or vertically.



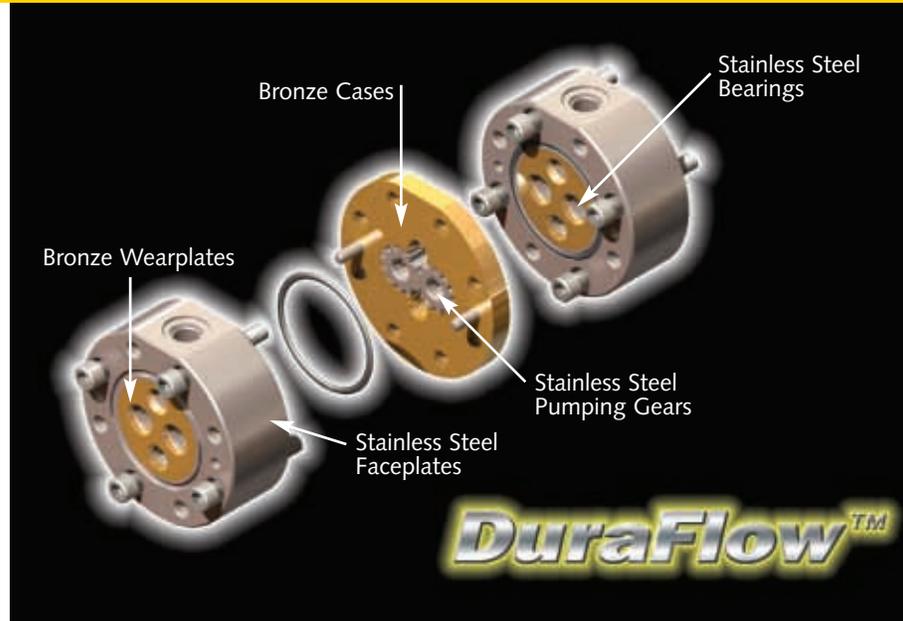
Circular Flow Dividers

The flow elements in a circular flow divider are arranged in a circular array and are linked together by a central planetary gear.

DuraFlow™ Corrosion-Resistant Flow Dividers

New Technology Delivers Reduced Life Cycle Costs

- Maximum uptime – Higher turbine availability
- Dramatic cost reductions for plant operation and maintenance budgets
- Resistant to corrosion during standby (or while turbine runs on natural gas)
- Higher reliability during startup of liquid fuel systems
- Resistant to failure from minor particulate contaminants in liquid fuel
- Low viscosity fuel applications



DuraFlow™ Corrosion-Resistant Flow Dividers guard against the most common causes of failure: corrosion and fuel-borne particulate damage.

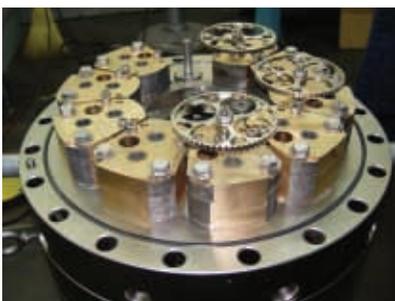
In these designs, cast iron has been completely eliminated. Linear models contain flow element faceplates made from stainless steel, and incorporate an ingenious system of replaceable bronze wearplates on both sides of the pumping gears. Gear cases are also made from a special bronze. These high performance materials are virtually unaffected by water in the fuel, so flow divider corrosion should no longer be a major issue. They are also highly durable and wear resistant to help extend service life.

These materials are less susceptible to failure should they ingest small, fuel-borne particulate contaminants. First, the relatively low surface hardness of bronze can allow small hard particles in the fuel to imbed, or plough through a running flow element, without precipitating a complete flow divider seizure. Secondly, bronze is an excellent bearing material. Bronze wearplates have the inherent ability to support stainless steel flow element gears running against them without galling.

By incorporating superior metals and improved design elements, DuraFlow™ is far more robust and corrosion-resistant than anything previously available.



Linear DuraFlow™ elements



Circular DuraFlow™ elements

DURAFLOW™ CORROSION-RESISTANT FLOW DIVIDERS

Application	Figure	Flow Rate (GPM)	Number of Elements	Fuel Type	Materials	Design
Frame 3	20452	100	6	Naphtha, Distillate	SST, Bronze	Linear
Frame 3	20468	20	6	Naphtha, Distillate	SST, Bronze	Linear
Frame 5, 6B	20491	34 - 70	10	Distillate	SST, Bronze	Linear
Frame 6F	20437	120	6	Distillate	SST, Bronze	Linear
Frame 7B	20402	120	10	Distillate	SST, Bronze	Linear
Frame 7EA	20495	160	10	Distillate	SST, Bronze	Linear
Frame 7FA	20403	270	14	Distillate	SST, Bronze	Linear
Frame 9E	20409	170	14	Distillate	SST, Bronze	Circular
Frame 9E	20429	210	14	Distillate	SST, Bronze	Circular
Frame 9F	20408	355	18	Distillate	SST, Bronze	Linear
Frame 9F	20433	355	18	Distillate	SST, Bronze	Circular
251B12	20404	100	8	Distillate	SST, Bronze	Linear
501D5	20427	180	14	Distillate	SST, Bronze	Linear
501F, 501G	20400	140	16	Distillate	SST, Bronze	Linear
501F, 501G	20401	40	16	Distillate	SST, Bronze	Linear
M701DA	20406	240	18	Distillate	SST, Bronze	Linear

Fuel and Lube Oil Pumps

Fuel Pumps

Roper Pump Company fuel pumps are positive displacement, spur gear pumps used as high-pressure main fuel pumps on gas turbines.

- Designed to order
- Materials of construction are selected for the specific fuel and service
- Built to withstand thermal shock and corrosion associated with most distillate and residual fuels.

ROPER FUEL PUMPS				
Application	Figure	Flow Rate (GPM)	Discharge Pressure	RPM
FRAME 3	20007	60	1500 PSI	3600
FRAME 5	2140	60	1000 PSI	2700
FRAME 5	2951	50	1000 PSI	1800
FRAME 7B	20002	60	1000 PSI	3000
FRAME 7B	20183	88	800 PSI	3000
FRAME 7B	20184	176	800 PSI	1200
FRAME 9C, 9B	20004	155	1000 PSI	1200
NP 10 B1	20354	23	1400 PSI	1470
PGT 10	20287	16	1450 PSI	1500

High Pressure Pumps

Roper Pump Company high pressure pumps are positive displacement triple screw pumps.

- Achieves flow rates up to 500 GPM at pressures up to 1000 PSI
- Delivers smooth flows with minimum pulsation
- Handles seal and lubrication oil, transformer oil, hydraulic oil, and fuel oil
- Does not require timing gears
- Features a cartridge design for ease of maintenance

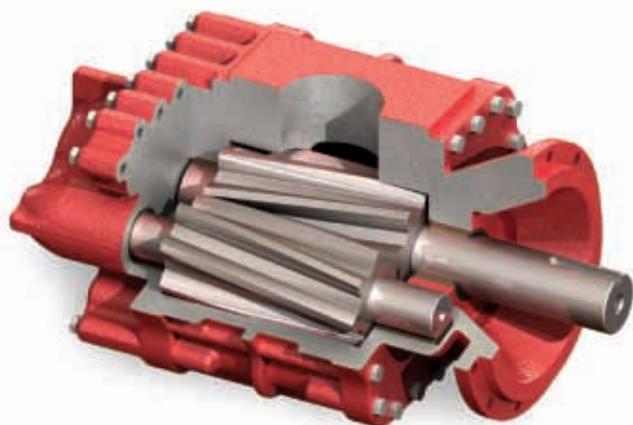


Lubrication Oil Pumps

Roper Pump Company lubrication oil pumps are positive displacement gear pumps designed to be part of the lubrication system of large engines, turbines, compressors, generator sets and gear reducers.

Available as:

- Two-gear pumps designed to be equipment mounted and directly driven - Flows to 600 GPM and pressures to 180 PSI
- Three-gear pumps with sleeve or roller bearings - Flows to 1250 GPM and pressures to 100 PSI
- Speed ranges from 250 to 3600 RPM
- Various drive arrangements are possible, including accessory pad mounting, direct drive by the equipment being lubricated, base mounting for motor drive, or bracket mounting for direct drive





Repair Service

Repair, Upgrade or Replace?

We offer a complete repair program for every pump and flow divider we manufacture. In addition, we can also provide suitable replacements for virtually any flow divider made, regardless of the original manufacturer.

Depending on the condition of your equipment, several options may be suggested.

- **REPAIR** your pump or flow divider to original factory specifications
- **UPGRADE** your flow divider. Existing cast iron flow dividers may be upgraded to our corrosion-resistant DuraFlow™ technology
- **REPLACE** your pump or flow divider, often the ideal opportunity to replace an existing flow divider with a brand new DuraFlow™ design.

Before work begins, customers will receive a complete written analysis of their equipment's condition and suggested repair options.

All repaired units are restored to original factory specifications, performance tested, and given the same full 1-year warranty as a brand new unit.



Global Service Network

Roper Pump Company has a worldwide network to handle your service requirements. Depending on the type of unit and your needs, service options include:

- Return unit directly to Roper Pump Company or a factory authorized repair center for service
- Field service by Roper Pump Company Field Service Engineers or factory authorized service centers
- Exchange (offered for most common models)

To determine which program is best for you, contact the Roper Pump Company Customer Service Dept. at the phone numbers or e-mail shown on the back of this brochure.

THE LEADING FORCE behind liquids™ since 1857

We offer rapid repair and performance testing of all Roper Pump Company products in accordance with OEM specifications.

Authorized distributors and representatives located around the globe supply new pumps and flow dividers, spare parts, repair services, exchanges and service support.

FULL 1-YEAR
FACTORY WARRANTY
ON ALL PUMP AND
FLOW DIVIDER REPAIRS



THE LEADING FORCE behind liquids™ since 1857



Roper Pump Company is a global supplier of high quality positive displacement pumps, designed to handle a broad range of industrial applications. In addition to helical gear pumps, progressing cavity pumps and triple screw pumps, we design and develop numerous custom pumps for customers with unique and demanding applications.

From a small pump company founded in 1857, Roper Pump Company has grown into a technological leader. With a large installed base, we have both the knowledge and experience to help you solve your most challenging pumping problems...and our strong global distribution network ensures that your needs are met on time, every time.

Our Markets



INDUSTRIAL

Roper Pump Company's rugged and dependable range of positive displacement pumps provides versatile pumping solutions for even the most challenging industrial applications.



TRANSPORT

With over a century of experience in liquid cargo transfer, Roper Pump Company has always been trusted to load and unload your tankers quickly and safely.



POWER GENERATION

For reliable operation of engines, compressors and turbines, thousands of customers depend on Roper Pump Company fuel pumps, lube pumps and liquid fuel flow dividers.



OIL & GAS

Roper Pump Company has numerous pumping solutions from the well to the refinery. Our industry leading DragonSlayer® Power Sections allow mud motors to run longer at unprecedented temperatures and depths.

Roper Pump Company

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