

MULTIPHASE PUMP SYSTEMS

INCREASE OIL PRODUCTION

UP TO **70%**



HOUTTUIN™ ROSSCOR®
SES INTERNATIONAL® SICELUB® WARREN®



CLIENT SPECIFIC SOLUTIONS

With a proven track record, CIRCOR has the right technologies to help our customers achieve their business goals. We deliver the most cost-effective and efficient design for your multiphase pump package: from basic, stand-alone pump skids to turnkey, remoteoperated multiphase stations. Our packages are complete with all the ancillary equipment required to meet the most difficult oil and gas specifications, including strainers, power supply, power distribution, variable speed drive, seal, lubrication, recirculation, cooling and control systems. Working closely with its customers, CIRCOR provides project management resources to execute safe, reliable packages that are easy to operate and maintain, all within the defined project schedules and budgets.

WHY MULTIPHASE SYSTEMS

Our two-screw multiphase pump systems have been used on pipelines and wellpads for over 20 years. The systems efficiently utilize one pump to boost complete, untreated production flows (mixture of oil, gas, condensates, water and/or particulates) through multiphase gathering pipelines. The systems reduce wellhead pressure, stimulating increased production and simplify surface facilities, eliminating infrastructure associated with separation and independent water, gas and oil gathering systems.

KEY FEATURES

- › 20+ years of systems integration expertise
- › 100+ years of twin-screw OEM expertise
- › API 676 compliance
- › Custom turnkey packages
- › Internal & external pump liquid recirculation
- › Installation, commissioning and lifecycle service
- › Up to 100% gas volume fraction (GVF)
- › Compact, efficient designs
- › Unparalleled pump efficiencies
- › Remote & local system controls
- › Plan 52,53 & 54 ancillary systems
- › Full integration with SCADA systems

SURFACE MULTIPHASE PUMPING SYSTEMS



PRODUCTION CAPABILITIES

- › Pipeline boosting and gathering
- › Mature well backpressure control
- › Vapor recovery
- › Heavy Oil (CSS/SAGD) production
- › Gas well dewatering



APPLICATIONS AND BENEFITS

PIPELINE BOOSTING AND GATHERING

Simplify your infrastructure by pumping oil, gas, water, condensates and solids with ONE pump through ONE pipeline. These solutions are especially beneficial for offshore, flaring sensitive and heavy oil production fields.

BENEFITS

REDUCE CAPITAL EXPENDITURES

- › Eliminate field separation
- › Eliminate redundant pipelines for water, oil and gas
- › Utilize surface rather than downhole technologies

ELIMINATE FLARING

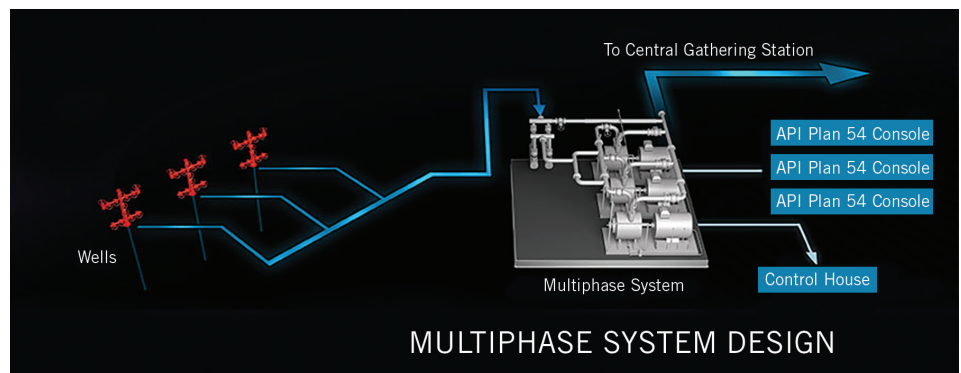
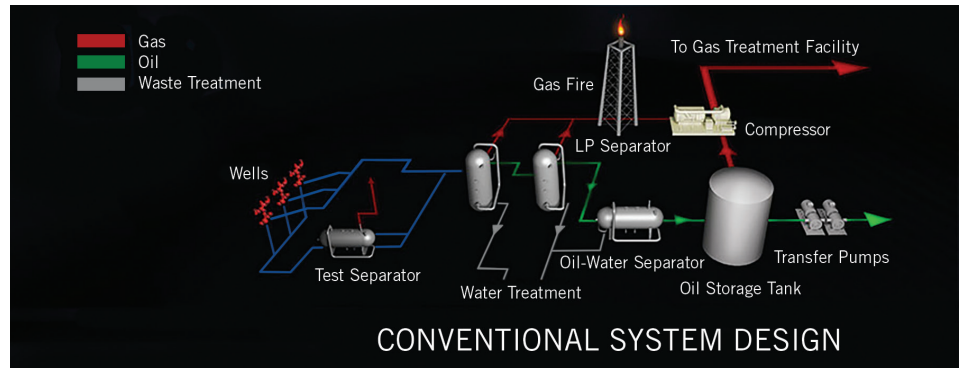
- › Gas accompanies oil and water to central processing facility

SIMPLIFY SURFACE FACILITIES

- › Eliminate complex gas management systems
- › Remote automated controls

REDUCE OPERATING EXPENDITURES

- › Improve mean time between failures (MTBF)
- › Reduce power consumption



APPLICATIONS AND BENEFITS

MATURE WELL BACKPRESSURE CONTROL

Increase oil and gas production in mature wells or revitalize shut-in wells using our pump system to reduce well back-pressure.

BENEFITS AND RESULTS

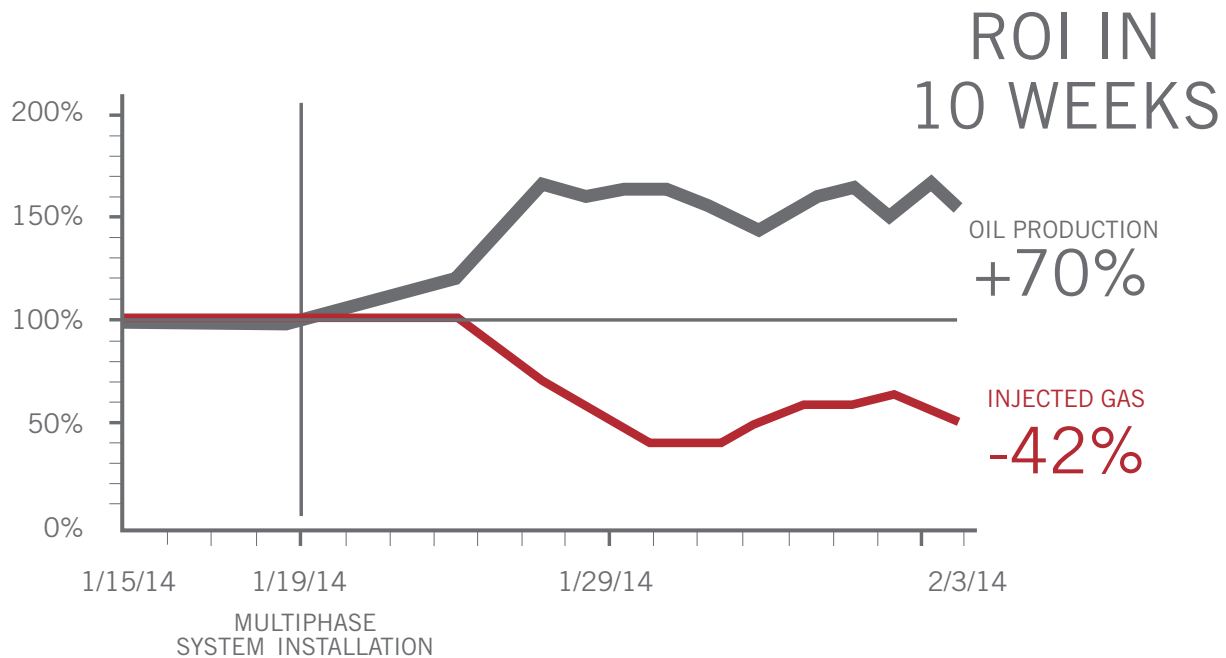
For mature wells, Multiphase pumping systems can deliver up to:

- › 70% increase in oil production
- › 8-year extension of well life
- › 150% increase in produced gas
- › 100% reduction in injected gas
- › Immediately cash-flow positive



MATURE WELL PRODUCTION OPTIMIZATION CASE STUDY

January - February 2014 | 20% reduction in well back-pressure

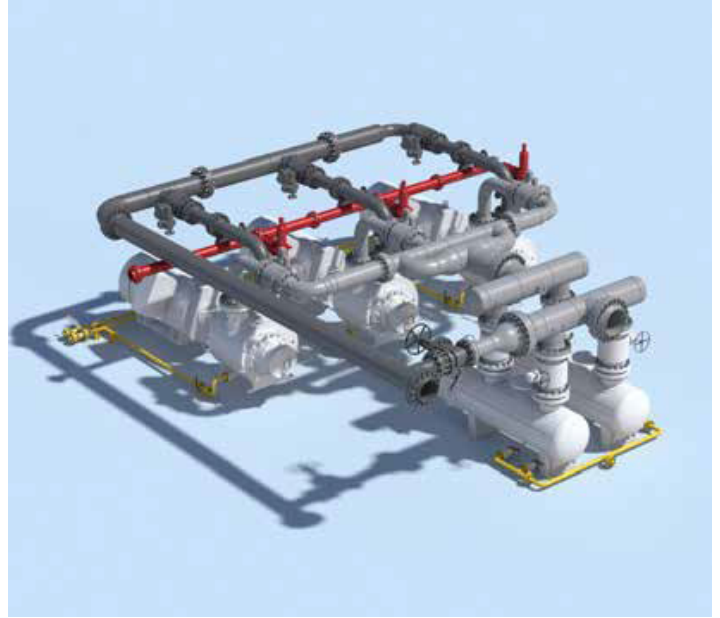


HOW MULTIPHASE SYSTEMS WORK

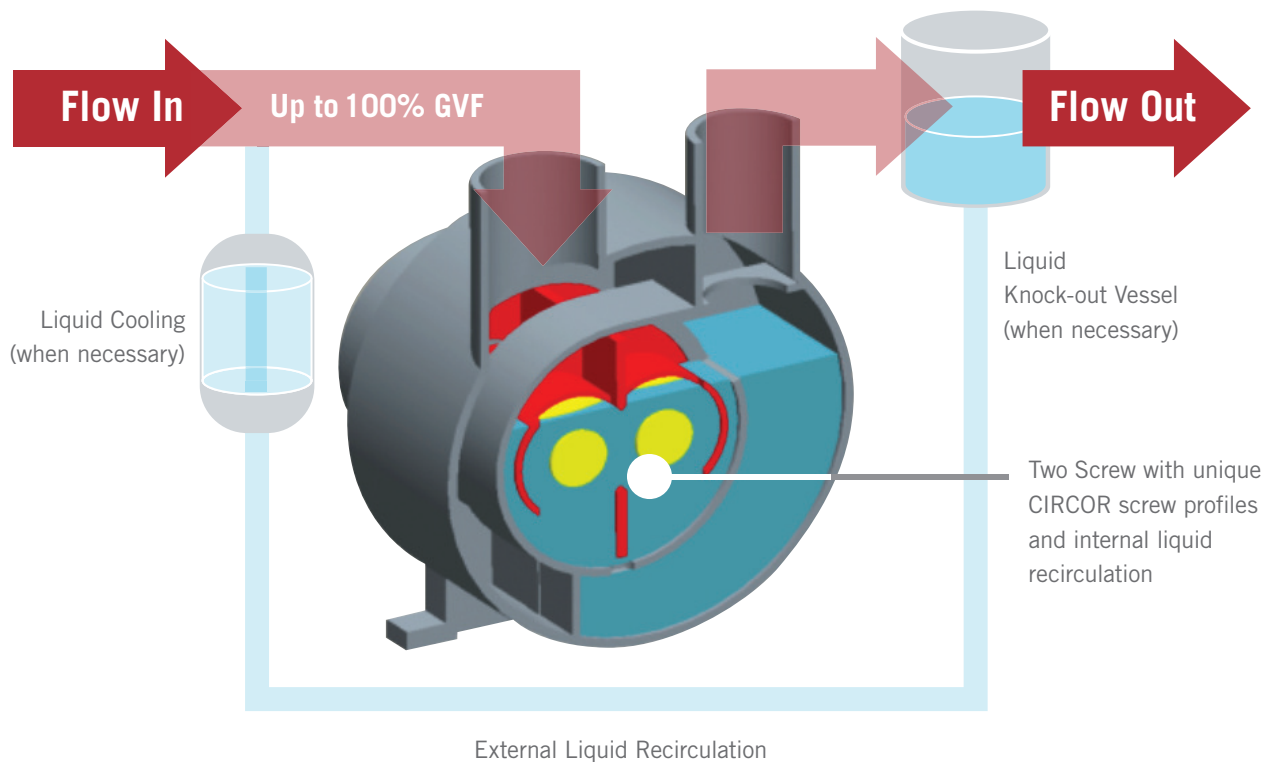
Our systems utilize positive displacement pump technology combined with industry leading internal (to pump) and external (to pump) recirculation systems to pump the multiphase flows.

Primary pump components are two intermeshing, self-priming screws that isolate a volume of liquid and convey it from pump inlet to outlet. Properly timed, the screws overcome conventional pump challenges – running dry, sandy or high GVF flows – as the screws do not contact either each other or their housing. For fluids up to 97% GVF, the pump housing includes an embedded liquid reservoir that releases liquid into the screw mechanisms. This liquid maintains proper pump efficiency through optimal internal sealing of the pump elements and dissipates heat generated from compressing the gas portion of the flow.

A complete system, with fully automatable controls, encompasses the pump to ensure optimal operations in our constantly changing oil and gas conditions. Motors, strainers, knock-out vessels, balancing and recirculation lines, valves, lube systems and heat exchangers are some of the primary system components that work together to ensure consistent, efficient operations while extending the system's capabilities to 100% GVF flows.



BASIC OPERATION OF TWO-SCREW MULTIPHASE SYSTEM



ADVANTAGES OF CIRCOR MULTIPHASE

CIRCOR brings significant experience and expertise to Multiphase Pumping Systems:

- › Pioneers in two-screw pumping and integrated systems, with over 100 years of experience
- › Industry leading pump efficiencies
- › Proven reliability in the harshest environments and with the most difficult fluids:
 - › High and low ambient temperatures up to 100% GVF
 - › High sand content
 - › Condensate/vapor fluids
- › Build-to-suit philosophy with full customization: materials, standards, modularity, skid/truck mount
- › State-of-the-art rotor designs, profiles, material selection and manufacturing methods
- › Time-tested, proven controls that safely and reliably optimize system operations, even remotely.



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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