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Crude Oil  
Transport Solutions



## Crude Oil Transport Today

## Solutions



### The Challenges You Are Facing

Transporting crude oil from remote fields to the consumer market is a long haul. Along this intricate network of pipelines, processing facilities and tank farms, the crude oil must be repeatedly moved, treated, separated, boosted and ultimately refined prior to its delivery to various end markets. The total process is immensely energy intensive.

In the past, energy was more affordable and readily available and many crude oil producers and pipeline operators only concern was the reliable and uninterrupted operation of their facilities. That single focus has now changed. With soaring energy costs, finite power generating capabilities, tighter emissions controls and imminent carbon footprints regulations, existing operations and new projects are focusing more on the Total Savings of Ownership (TSO) to find better ways to manage their businesses by reducing operating expenses.

### You're Not on Your Own

Providing real, meaningful fluid handling solutions to these challenges is what sets Colfax Americas apart as an industry partner. The proven technical solutions we can bring to your operations come from the strong legacy brands (see brands below) that make up Colfax. This diverse portfolio can be readily applied by our experienced engineering staff to assist you in solving current and future complex process and application challenges with cutting edge technical solutions.

### Customer Support

Once the equipment is in the field, our experienced, authorized parts and service network continues to work with you to maximize your savings to grow your bottom line even further. In addition, we will map out for you service and inventory management programs to make sure that all of your needs are looked after.

### Why Listen to Us?

For over a decade, Colfax has built an organization of strong legacy companies, some with histories of over 100 years, that lead the industry with cutting-edge pump technologies and fluid handling solutions. When precision is mandatory and failure not an option, the most trusted name in critical fluid handling is Colfax.

### Feature

### Benefit

#### 3-Screw

- Hardened rotor set
- Bimetal construction
- Replaceable rotor housings
- Carbide coated high velocity areas
- Single seal & bearing
- Axial flow design
- Balanced hydraulic forces
- No ball bearing (double suction design)

- Long life on contaminated product
- Increased pressure capability
- Field repairable
- Increased wear resistance
- Reduced maintenance costs
- Reduced NPSHR
- Long bearing & seal life
- High temperature operation

#### 2-Screw

- Double suction
- External bearings & gears
- Non-contacting rotors
- Very low axial velocity
- Large flow cavities
- High temperature materials
- Hardened rotor set

- Balanced forces / Low fluid velocity
- High fluid contaminate capability
- Dry run capability
- Excellent NPSH capability
- High viscosity capability
- Operational capability to 750° F
- Long rotor life

#### Progressing Cavity

- Ductile chrome plated rotor
- Various stator elastomer materials
- Oil filled & sealed con rod joint
- Equal wall stator
- Open hopper design available

- Increased wear resistance
- Increased fluid compatibility
- Long life on contaminated fluid
- High pressure capability
- Extreme high viscosity capability

#### Thermal Oil

- Unique heat dissipating bearing frame
- Large mechanical seal chamber
- Inboard journal bearing
- Sealed outboard ball bearing
- Safety packing rings

- Operational capability to 700° F
- Increased seal lubrication & life
- High overhung load capability
- Reduced maintenance / Long life
- Improved journal bearing & seal protection

#### Precision Gear

- Close tolerance dimensions
- Stainless steel materials available
- Through hardened abrasion resistant materials

- Precision metering capability
- Ability to pump aggressive fluids
- Increased pump life and high pressure capability



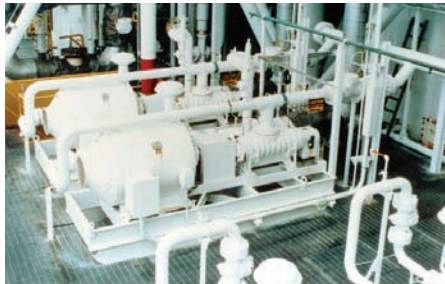


## « Products »

**Location:** Western Canada  
**Application:** Pipeline Boost  
**Solution:** 3-Screw  
**Pressure:** 1400 psig  
**Flowrate:** 430 gpm



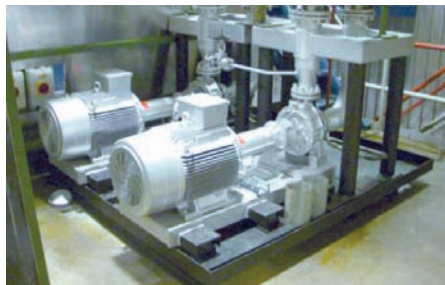
**Location:** Offshore California  
**Application:** Pipeline Transfer  
**Solution:** 2-Screw  
**Pressure:** 400 psig  
**Flowrate:** 100 gpm



**Location:** Western Canada  
**Application:** Additive Storage  
**Solution:** Progressing Cavity  
**Pressure:** 350 psig  
**Flowrate:** 50 gpm



**Location:** Western Canada  
**Application:** Pipeline Heating  
**Solution:** Thermal Oil  
**Pressure:** 300 psig  
**Flowrate:** 600 gpm



**Location:** Northwestern Canada  
**Application:** DRA\* Injection  
**Solution:** Precision Gear  
**Pressure:** 1400 psig  
**Flowrate:** 7 gpm

\*Drag Reducing Agent



## « Applications »

### Gathering Line Transfer

An upstream application where a number of gathering lines combine into a common flow header. This process typically requires pumps of high flow capability, to pump to either a tank farm or processing facility.

### Storage Tank Transfer

An upstream, midstream or downstream application that involves moving crude oil to either a pipeline, truck loading or other sales point. Typically, crude oil that passes through this point has been exposed to some degree of processing to enhance its quality and cleanliness.

### Charge

An upstream or downstream application that involves the pumping of feedstock into a processing unit.

### Shipping

A mid-stream application downstream of the LACT unit. This process may involve either high or low pressure pumping. At this point, quality of the crude oil meets industry standards for sell and custody of the crude oil has been transferred to the pipeline owner.

### Pipeline Injection

A mid-stream application that involves injecting crude oil from a low pressure source into a high pressure pipeline.

### Suction Booster

A midstream application where it is necessary to increase system pressure from a storage vessel to meet the inlet pressure demands of rotating equipment downstream.

### Pipeline Booster

A mid-stream application that involves elevating pipeline pressure that has fallen due to long distance pumping. Typically, booster stations are located in remote areas and in most cases are not manned.

### Chemical Injection

A mid-stream application involving the injection of chemicals to petroleum based products.

### Loading

Typically considered a downstream application that involves either the loading or unloading of petroleum product, occasionally at elevated temperatures, for shipment by either barge, tanker, truck or train.

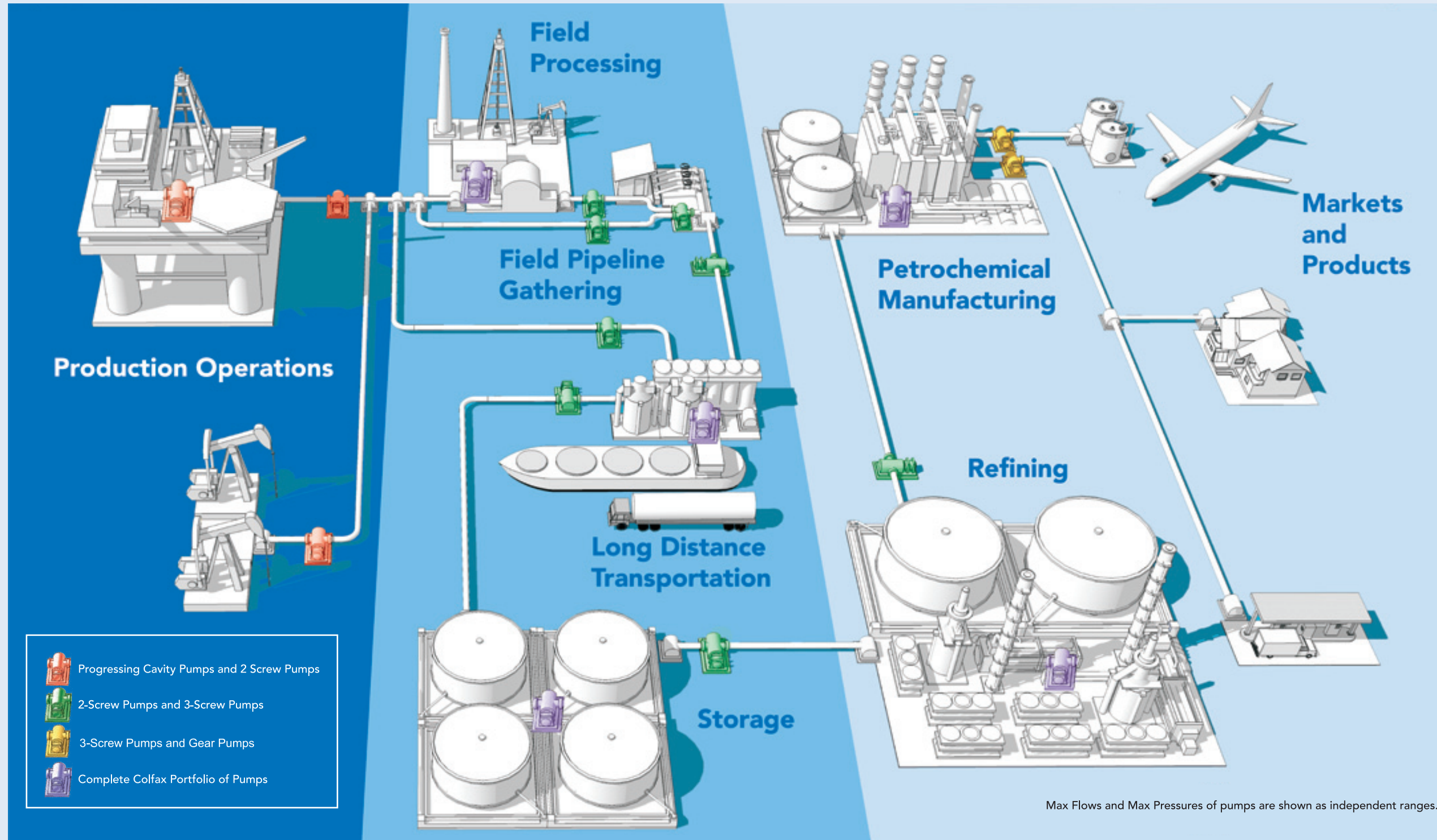


# Upstream → Midstream → Downstream

## Crude Oil Transport Solutions For All Three Streams

In the oil fields of the world, Colfax solutions deliver in the most critical applications, toughest environments and remotest locations, pumping the most demanding fluids: light and heavy crude, bunker, bitumen, slop oil, distillate, lubricating oil and oily water. Recognized as a leading global supplier of screw pumps, pumping solutions and lubrication systems, Colfax has met the needs of nearly every major oil and gas supplier - ConocoPhillips, ExxonMobil, Shell, PDVSA, Husky Energy and Saudi Aramco, among other national oil companies (NOCs) - in the Americas, Europe, the Middle East, Africa and Asia-Pacific for nearly 90 years.

Whether your application is in upstream, midstream or downstream, you can rely on the Colfax portfolio of pumps and systems from Allweiler, Houttuin, Imo, Imo AB, LSC, Warren and Zenith. In fact, Colfax oil transfer solutions help move 4.5 million barrels of crude oil every day. That's enough to power 69 million cars or generate 2800+ gigawatt hours per day of electricity.



Progressing Cavity Pumps

Max Flow: 2000 gpm  
 Max Pressure: 600 psig  
 Min Viscosity: 1 cSt  
 Max Temp: 330 deg F



2-Screw Pumps

Max Flow: 9700 gpm  
 Max Pressure: 1400 psig  
 Min Viscosity: .5 cSt  
 Max Temp: 750 deg F



Internal Gear Pump

Max Flow: 230 gpm  
 Max Pressure: 5000 psig  
 Min Viscosity: .3 cSt  
 Max Temp: 350 deg F



External Gear Pump

Max Flow: 7 gpm  
 Max Pressure: 2500 psig  
 Min Viscosity: .5 cSt  
 Max Temp: 950 deg F



3-Screw Pump

Max Flow: 3300 gpm  
 Max Pressure: 4500 psig  
 Min Viscosity: 2 cSt  
 Max Temp: 500 deg F



Hot Oil Centrifugal Pumps

Max Flow: 6000 gpm  
 Max Pressure: 400 psig  
 Min Viscosity: 100 cSt  
 Max Temp: 700 deg F