Industry Guide
to Products for

CHEMICAL PROCESSING

Clark·Reliance®

Your Single Source for Reliability in Level Indication & Control, Sightflow Indication, Filtration and Separation

The chemical processing industry has looked to Clark-Reliance for decades for the most extensive product line in level measurement and control. The company has recently emerged as a leader in separation and filtration for the industry as well.

Clark-Reliance's history of innovation dates back to 1884, when the Reliance Gage Column Company introduced the company's first breakthrough product: a low water alarm for boilers. Using floats attached to a steam whistle, this revolutionary device sounded an alarm when water conditions became unsafe.

Today, after acquiring a number of distinguished product lines, we offer an integrated, unified, service-driven approach to instrumentation, control and filtration. Our broad product offering can provide the convenience and responsibility of a single source for many products for your plant.

Despite their far-ranging variety, all Clark-Reliance products share a common attribute: they provide the reliability essential to critical applications throughout your operation.

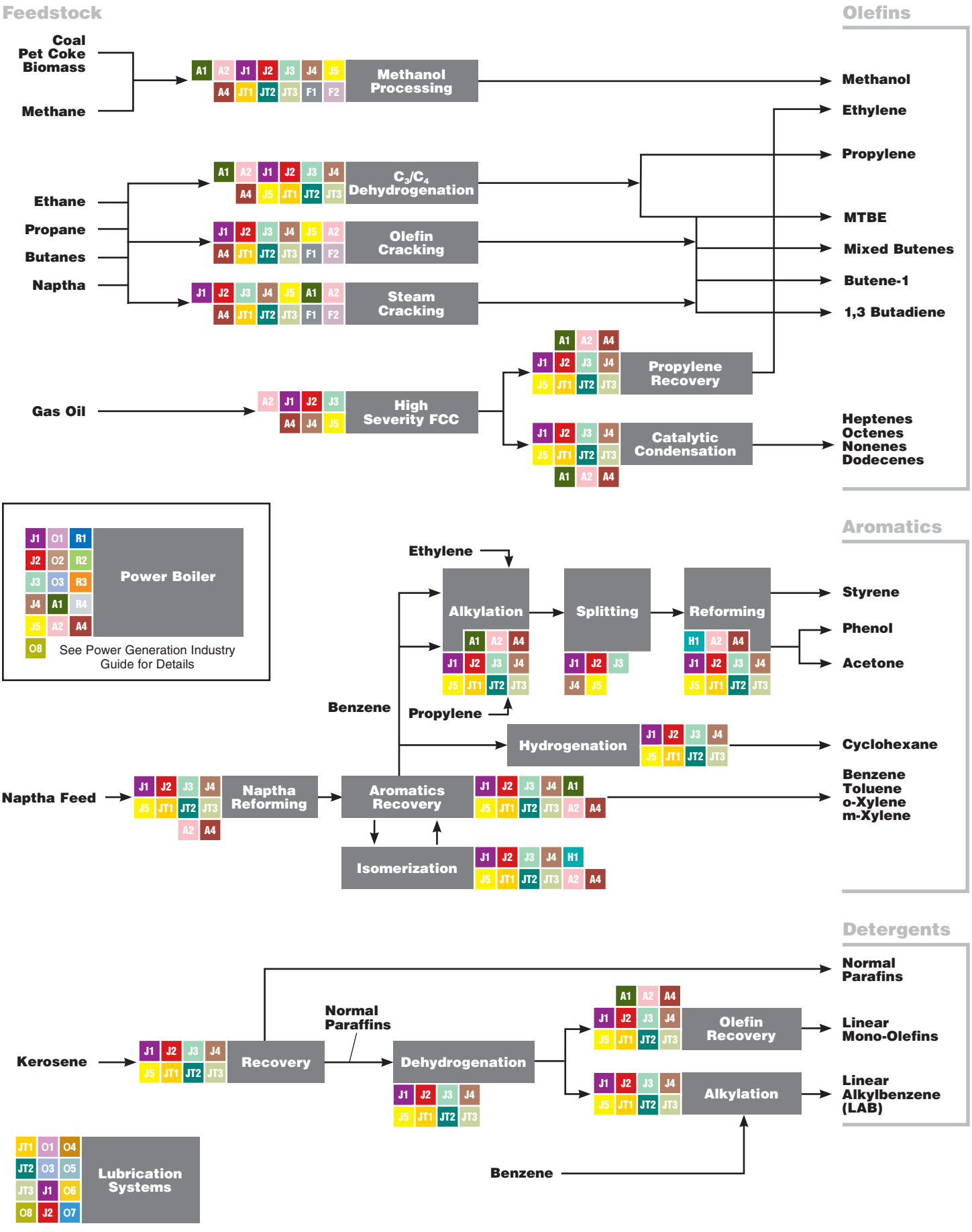
Clark·Reliance®

How To Use This Brochure

Clark-Reliance product information is presented three ways in this brochure:

Pages 4–7	Schematic illustrations indicate Clark-Reliance products relating to typical processes in the chemical processing industry. There are two schematics: one for petrochemical processing, and one for batch processing.
Pages 8–16	Overview of products with cross reference to plant applications
Pages 17–23	Process overview with cross reference to products employed

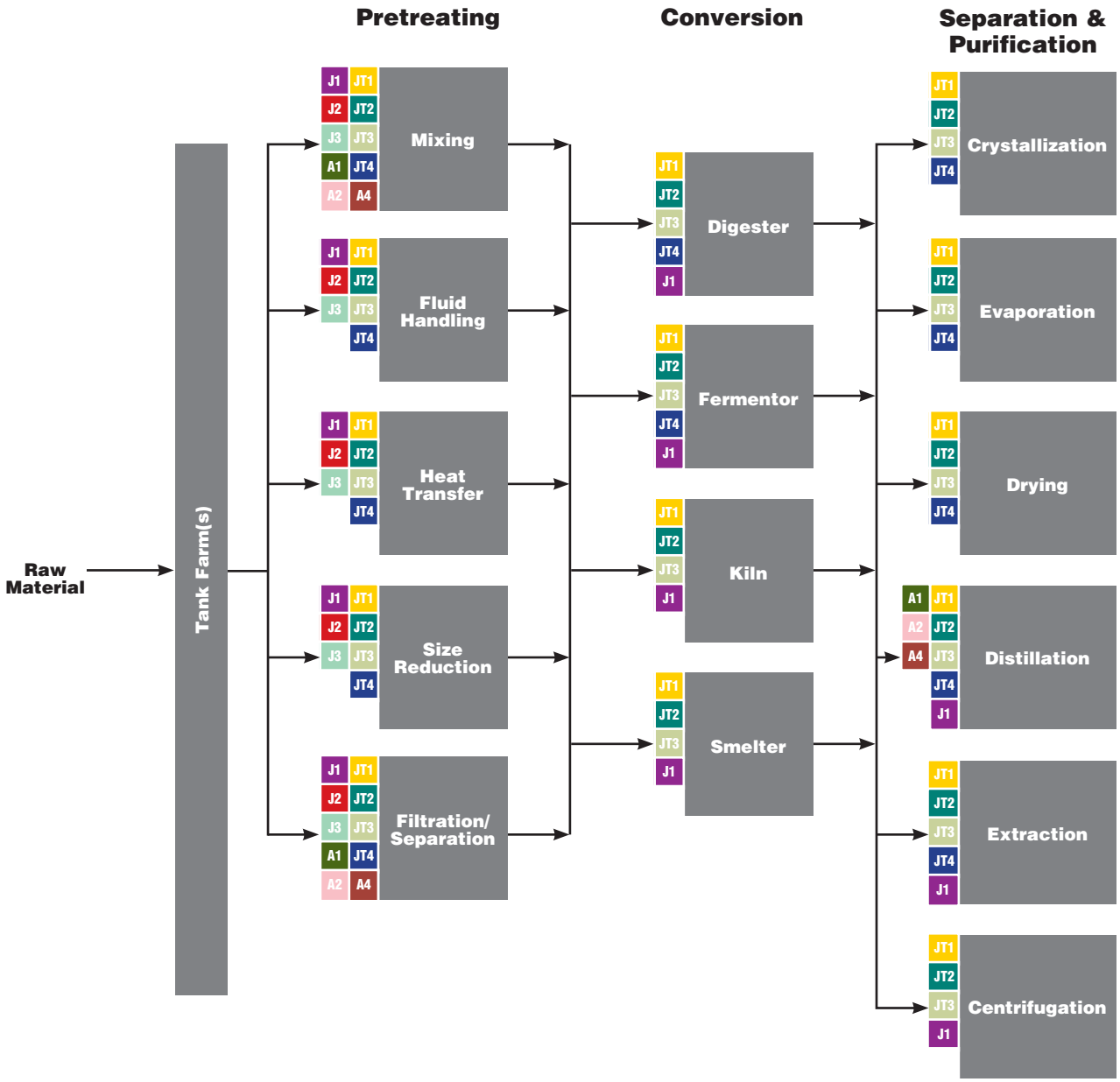
Petrochemical

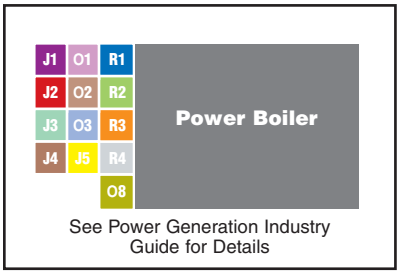


PRODUCTS OFFERED

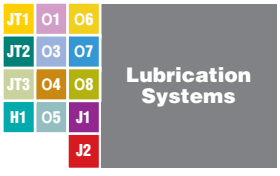
Clark·Reliance®

Batch


Pretreating
Conversion
Separation & Purification
Raw Material
Tank Farm(s)
Mixing
Fluid Handling
Heat Transfer
Size Reduction
Filtration/ Separation
Digester
Fermentor
Kiln
Smelter
Crystallization
Evaporation
Drying
Distillation
Extraction
Centrifugation


Power Boiler
See Power Generation Industry Guide for Details


Waste Management and Treatment


Lubrication Systems

PRODUCTS OFFERED

Clark·Reliance®

J1

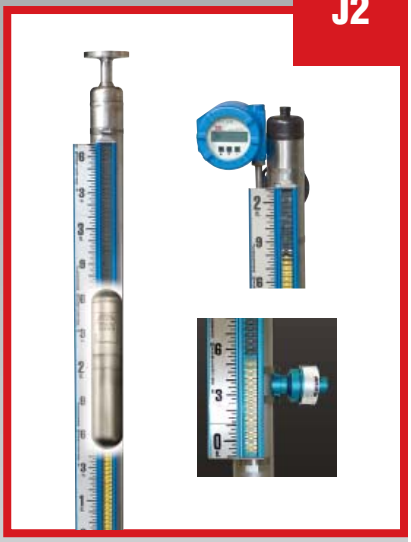
Jerguson®
Glass Level Gages

Direct reading reflex and transparent Flat Glass Gages for liquid level management feature a recessed gasket surface for improved reliability and ease of maintenance. Improve visibility of transparent gages, especially when mica shields are required, with an intense white LED illuminator, model EPL-100. A variety of gage valves are available with safety ballchecks along with a broad range of accessories as required per application.

PLANT APPLICATIONS:

Methane Processing	Catalytic Condensation	Dehydrogenation	Lubrication Systems
Dehydrogenation	Alkylation	Naptha Reforming	Filtration/Separation
Olefin Cracking	Splitting	Aromatics Recovery	Heat Transfer
Steam Cracking	Reforming	Isomerization	Size Reduction
FCC	Hydrogenation	Olefin Recovery	Mixing
Propylene Recovery	Recovery	Power Boiler	Fluid Handling

J2



Jerguson
Magnetic Level Gages

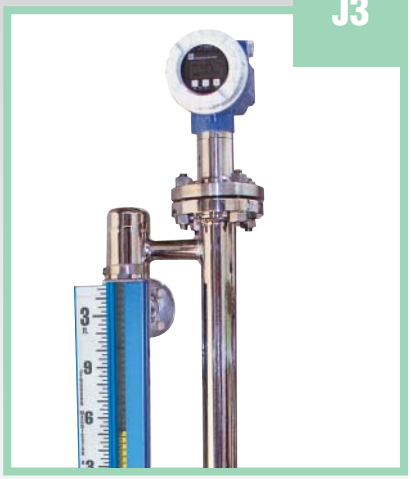
Watch the video!

Jerguson Magnicator® Magnetic Level Gages feature the most reliable magnetic circuit available through the use of a patented float magnet arrangement and a highly vibration-resistant indicator flag assembly. Magnetic gages offer improved visibility and reduced maintenance compared to glass level gages. Integrate the Magnetic Level Gage to your control system using a variety of point level switches or externally mounted continuous output transmitters. All gage designs meet the requirements of ASME B31.1 & B31.3 as a standard. Specify FlashProof chambers for cryogenic or light end applications to eliminate false level indications.

PLANT APPLICATIONS:

Methane Processing	Catalytic Condensation	Dehydrogenation	Lubrication Systems
Dehydrogenation	Alkylation	Naptha Reforming	Filtration/Separation
Olefin Cracking	Splitting	Aromatics Recovery	Heat Transfer
Steam Cracking	Reforming	Isomerization	Size Reduction
FCC	Hydrogenation	Olefin Recovery	Mixing
Propylene Recovery	Recovery	Power Boiler	Fluid Handling

J3



Jerguson
Model MGWR Gages

Redundant level measurement package featuring indirect reading Magnetic Level Gage and independent Guided Wave Radar transmitter. Guided Wave Radar transmitters provide highly accurate and reliable level measurement in light hydrocarbon applications and are not dependent upon the Magnetic Gage Float for deriving a level signal. Custom bridles available to create double or triple redundant GWR transmitters with a direct reading glass or magnetic gage in a single package.

PLANT APPLICATIONS:

Methane Processing	Catalytic Condensation	Dehydrogenation	Filtration/Separation
Dehydrogenation	Alkylation	Naptha Reforming	Heat Transfer
FCC	Splitting	Aromatics Recovery	Size Reduction
Propylene Recovery	Reforming	Isomerization	Mixing
Olefin Cracking	Hydrogenation	Olefin Recovery	Fluid Handling
Steam Cracking	Recovery	Power Boiler	

Jerguson®
External Cage Level Switches

Watch the video!

Jerguson External Cage Level Switches feature a unique, tri-magnet switch mechanism that provides a snap-action switch strictly through the use of repelling magnetic fields. Float operated models are available up to 1000˚F (537˚C) providing a reliable switch in high temperature applications without the use of springs (as with displacer switches). All designs comply with ASME B31.1 & B31.3 as standard.

PLANT APPLICATIONS:

Methane Processing	Steam Cracking	Hydrogenation	Isomerization
Dehydrogenation	Catalytic Condensation	Recovery	Olefin Recovery
FCC	Alkylation	Dehydrogenation	Power Boiler
Propylene Recovery	Splitting	Naptha Reforming	
Olefin Cracking	Reforming	Aromatics Recovery	

J4

Jerguson
Displacer Level Transmitters

Jerguson Displacer Level Transmitters feature LVDT (Linear Variable Differential Transformer) technology to provide reliable level indication and avoid issues with wear points and drift that occur with other technologies. All pressure chambers are designed in accordance with ASME B31.1 & B31.3 as a standard.

PLANT APPLICATIONS:

Methane Processing	Steam Cracking	Hydrogenation	Isomerization
Dehydrogenation	Catalytic Condensation	Recovery	Olefin Recovery
FCC	Alkylation	Dehydrogenation	Power Boiler
Propylene Recovery	Splitting	Naptha Reforming	
Olefin Cracking	Reforming	Aromatics Recovery	

J5

Jacoby-Tarbox®
Sight Flow Indicators

Jacoby-Tarbox Sight Flow Indicators are designed in accordance with ASME B31.1 and B31.3 using only listed metals within its construction to ensure full specification compliance and meet more specifications “out of the box” than any manufacturer. This includes NACE compliance, standard for wetted materials. Jacoby-Tarbox units offer unique features that allow them to have the longest duty cycles in the industry. Jacoby-Tarbox also offers a variety of API 614 compliant solutions for lubricating systems on rotating equipment.

PLANT APPLICATIONS:

Mixing	Fermentation	Distillation	Methanol Processing	Alkylation	Recovery
Fluid Handling	Kiln	Extraction	C3/C4 Dehydrogenation	Reforming	Dehydrogenation
Heat Transfer	Smelter	Centrifugation	Olefin Cracking	Hydrogenation	Olefin Recovery
Size Reduction	Crystallization	Waste Management and Treatment	Steam Cracking	Naptha Reforming	Alkylation
Filtration/Separation	Evaporation	Lubrication Systems	Propylene Recovery	Aromatics Recovery	Lubrication Systems
Digester	Drying		Catalytic Condensation	Isomerization	

JT1

JT2

Jacoby-Tarbox®
Sight Windows

Jacoby-Tarbox Sight Windows are used for process observation on various treaters and with processes that involve mixed, blended, distilled, or potentially stratified material. Sight windows are an optional solution for API 614 compliance in lubricating systems on rotating equipment.

PLANT APPLICATIONS:

Mixing
Fluid Handling
Heat Transfer
Size Reduction
Filtration/Separation
Digester
Fermentation
Kiln
Smelter
Crystallization
Evaporation
Drying
Distillation
Extraction
Centrifugation
Waste Management and Treatment
Lubrication Systems
Methanol Processing
C3/C4 Dehydrogenation
Olefin Cracking
Steam Cracking
Propylene Recovery
Catalytic Condensation
Alkylation
Reforming
Hydrogenation
Naptha Reforming
Aromatics Recovery
Isomerization
Recovery
Dehydrogenation
Olefin Recovery

JT3

Jacoby-Tarbox
Phaeton® XTL Lighting

Watch the video!

Jacoby-Tarbox Phaeton XTL LED Tank Lighting offers a long-lasting, low operating cost solution to tank and sight flow indicator lighting needs. Vibration resistant, long-life LED's virtually eliminate maintenance.

PLANT APPLICATIONS:

Mixing
Fluid Handling
Heat Transfer
Size Reduction
Filtration/Separation
Digester
Fermentation
Kiln
Smelter
Crystallization
Evaporation
Drying
Distillation
Extraction
Centrifugation
Waste Management and Treatment
Lubrication Systems
Methanol Processing
C3/C4 Dehydrogenation
Olefin Cracking
Steam Cracking
Propylene Recovery
Catalytic Condensation
Alkylation
Reforming
Hydrogenation
Naptha Reforming
Aromatics Recovery
Isomerization
Recovery
Dehydrogenation
Olefin Recovery

JT4

Jacoby-Tarbox
Eductors

Jacoby-Tarbox in-tank Eductors are used in process tanks requiring mixing, blending, or to prevent material stratification. In-tank eductors work independently, or in concert with other mixing technologies. In-line eductors are used in various applications, the most common being an alternative means to transport media to and from processes, or to combine liquids or gases while in-line instead of in-tank.

PLANT APPLICATIONS:

Mixing
Fluid Handling
Heat Transfer
Size Reduction
Filtration/Separation
Digester
Fermentor
Crystallization
Evaporation
Drying
Distillation
Extraction

HYCOA Liquid Filters

H1

Process and lubrication liquids often require absolute particle removal to ensure product quality and protection of equipment. The installation of absolute-rated Clark-Reliance HYCOA filters make it possible to improve process efficiency and provide optimal process protection. HYCOA elements are available in micro-glass, polyester, and polypropylene. The graded-density structure of HYCOA filter products for liquids remove solids and deformable contaminants that would quickly plug competitive filter elements.

PLANT APPLICATIONS:

Isomerization Reactor Liquid Outlet
Isomerization Mol Sieve Dryer Naptha Inlet
Isomerization Mol Sieve Dryer Naptha Outlet
Isomerization Stabilizer Inlet
Reforming
Lubrication Systems

FILCOA®
Gas Coalescer Elements

F1

Gasses in many chemical processes can contain process liquids, hydrocarbons, and particulate. These contaminants can foul final products and process equipment such as reactors, cracking towers, compressors, furnaces, boilers, and turbines. FILCOA coalescer elements include a comprehensive range of absolute-rated micro-glass filters with broad chemical compatibility and special end fittings specifically designed to fit existing vessels.

PLANT APPLICATIONS:

Methanol Processing
Olefin Cracking
Steam Cracking

FILCOA
Liquid Lube Oil Filters

F2

Process and lubrication liquids often require absolute particle removal to ensure product quality and protection of equipment. The installation of absolute-rated Clark-Reliance FILCOA filters makes it possible to improve process efficiencies and provides optimal process protection. The graded-density structure of FILCOA filter products for liquids remove solids and deformable contaminants that would quickly plug competitive filter elements. Elements are available with special end fittings specifically designed to fit existing vessels.

PLANT APPLICATIONS:

Methanol Processing
Olefin Cracking
Steam Cracking

R1

Reliance®
Electro Eye-Hye® Remote Drum Level Indication System

The Electro Eye-Hye Drum Level Indication System provides remote indication of the drum level for steam and water applications up to 3000 PSI (207 Bar) and 695 degrees F (368 degrees C). This system consists of three components: 1) An Electrolev Column with 10, 12 or 20 conductivity probes located at specified levels, with 1" male pipe size (standard) vessel connections (flanged or female socket weld connections are also available); 2) a Control Unit that provides a switch contact for each probe level for High or Low Alarm and High or Low trip functions; 3) a Panel Indicator with Miniature Bi-Color (Red/Green) LED type or Tri-Color LED Indicator. Either type is designed for panel mounting in a control room or may be specified in a weatherproof enclosure for installation near the boiler.

PLANT APPLICATIONS: Auxiliary Boilers Power Boilers Process Steam Boilers

R2

Reliance
Water Columns and Standpipes

Water Columns and Standpipes are primarily used to support Water Gage Glasses. Water Columns are available in cast iron models for applications to 250 PSI (17 Bar) and steel models for applications up to 3000 PSI (207 Bar). Water Columns generally include conductivity probes for High & Low Alarms and Low Water Cutout functions. Standpipes support Water Gage Glasses, the same function as a Water Column, without probes. A Water Column or Standpipe provides the proper support for mounting a Water Gage Glass and assures stable observation of the drum level. An Electrolev Column may also serve as a Water Column to support a Water Gage Glass. This combination forms a “LevelMax” System for remote and local level indication in one assembly.

PLANT APPLICATIONS: Auxiliary Boilers Power Boilers Process Steam Boilers

R3

Reliance
Water Gage Glasses
Prismatic (Reflex), Flat Glass, and Simpliport® Bi-Color

Watch the video!

Prismatic Water Gage Glasses for applications up to 350 PSI (24 Bar) present the water as black up to the meniscus line. Flat Glass (Transparent) Water Gage Glasses with DuraStar LED Illumination for applications up to 2000 PSI (138 Bar) provide a bright “star-like” image at the water level, and Simpliport Bi-Color Ported Type Water Gage Glasses for applications up to 3000 PSI (207 Bar) with “Simpliport 180” Wide Angle LED Viewing System provide a bright green image up to the water line and red image for the steam indication above the water level.

PLANT APPLICATIONS: Auxiliary Boilers Power Boilers Process Steam Boilers

R4

Reliance®
Levalarms

Float or Conductivity Probe Type Level Switch used for primary or auxiliary low water cutouts. This device can also be used as a level alarm switch. Float actuated models are available for applications up to 800 PSI (54 Bar). Conductivity Probe type models are available for applications up to 1800 PSI (124 Bar).

PLANT APPLICATIONS:

Auxiliary Boilers
Power Boilers
Process Steam Boilers

O1

OFS
Vacuum Dehydration Oil Purification System (VDOPS)

A Vacuum Dehydration Oil Purification System (VDOPS) is designed to remove dissolved, emulsified, and free water from a variety of oils ranging from Lube, Hydraulic, and High Viscosity Gear Oils. A VDOPS will also remove particulate by use of its high efficiency particulate removal filter, typically rated 5 micron Beta(c) > 1000 per ISO 16889. A VDOPS uses vacuum, heat, and mass transfer to remove water from oil by changing it to a gas. Most water is put back in the atmosphere as water vapor and some is condensed into a holding chamber. A VDOPS is designed to recirculate or kidney loop reservoirs and maintain oil as low as 20 PPM on a continual basis. Particulate can be maintained as low as ISO 15/14/11.

PLANT APPLICATIONS:

Compressor Lube Systems
Main Turbine Lube Oil Systems
Boiler Lube Systems
Hydraulic Systems
Bearing Lube Systems
Gear Boxes
Mixer Lube Systems
Hydraulic Power Units

O2

OFS
Fuel Coalescers (FC)

Fuel Coalescers (FC) are designed to remove free and emulsified water from Fuel Systems. Water is removed by coalescing water droplets and gravity-separating them. Water is collected at the bottom of a coalescing vessel and drained by manual or automatic means. A FC will also remove particulate by use of its high efficiency particulate removal filter, typically rated 5 micron Beta(c) > 1000 per ISO 16889. Water in fuel can be maintained as low as 30 PPM and particulate as low as ISO 15/14/11.

PLANT APPLICATIONS:

Main Fuel Tanks
Outside Storage Tanks
Generator Belly Tanks
Main Fuel Supply to Turbine Generators

O3

OFS
Filter Carts & Low Flow Filtration

Filter Carts and Low Flow Filtration Systems are typically used to recirculate and kidney loop smaller lube, hydraulic, gear box reservoirs and fuel tanks. They can also be used to transfer new or make-up oil into reservoirs. Filter Carts are primarily designed to remove particulate by use of their high efficiency particulate removal filters, typically rated 5 micron Beta(c) > 1000 per ISO 16889. Particulate levels can be maintained as low as ISO 15/14/11.

PLANT APPLICATIONS:

Compressors
Main Turbine Lube Oil Reservoirs
Boiler Feed Pump Lube Oil
Speed Control Hydraulic Systems
Force Draft Fan Bearing Lube Systems
Cooling Tower Gear Boxes
Mixer Lube Systems
Heat Transfer Systems
Hydraulic Power Units and Fuel Tanks

O4

OFS
High Flow Filtration Systems (HFFS)

High Flow Filtration Systems (HFFS) are typically used to recirculate and kidney loop larger lube, hydraulic, gear box reservoirs and fuel tanks. They can also be used to transfer new or make-up oil into reservoirs. High Flow Filtration Systems are primarily designed to remove particulate by use of their high efficiency particulate removal filter, typically rated 5 micron Beta(c) > 1000 per ISO 16889. Particulate levels can be maintained as low as ISO 15/14/11.

PLANT APPLICATIONS:

Main Turbine Lube Oil Reservoirs
Boiler Feed Pump Lube Oil
Speed Control Hydraulic Systems
Force Draft Fan Bearing Lube Systems
Hydraulic Power Units
Cooling Tower Gear Boxes and Fuel Tanks

O5

OFS
Varnish Removal Systems (VRS)

Varnish Removal Systems (VRS) were developed to address the need to properly remove varnish (also known as lacquer, sludge, or tar) commonly found in various lubrication and hydraulic systems. The process utilizes a technology by Fluitec® called Electrophysical Separation Process™ (ESP), which is a patent-pending technology that absorbs dissolved and suspended oil degradation products – the cause of varnish. Varnish removal is accomplished with an oxidatively-stable filter media, engineered to selectively remove only the varnish-causing contaminants without disturbing the fluid's additives.

PLANT APPLICATIONS:

Compressor Lube Systems
Main Turbine Lube
Boiler Feed Pump Lube
EHC Speed Control Systems using Fire Retardant Fluids

O6

OFS

Filter Vessels - Simplex & Duplex

The harmful effect of particulate contamination in oils, fuels, and other hydrocarbons have been well documented. By maintaining absolute fluid cleanliness, the life of critical wear components can be dramatically increased, minimizing downtime and maximizing profitability. Simplex and duplex single and multi-element filter housing assemblies are available. Simple and reliable, these filter housing assemblies provide the needed framework for an outstanding filter system. Housings can be equipped with a multitude of filters from pleated micro-glass, resin impregnated cellulose, string wound, nylon mesh bag to stainless steel strainers.

PLANT APPLICATIONS:

Compressor Lube Systems
Main Turbine Lube Oil Reservoirs
Boiler Feed Pump Lube Oil
Speed Control Hydraulic Systems
Force Draft Fan Bearing Lube Systems
Cooling Tower Gear Boxes and Fuel Systems
Polishing of Downstream Hydrocarbons

O7

OFS

Oil & Fuel Purification and Flushing Services

OFS has the manpower and equipment to perform turnkey oil flushing and filtration services anywhere in the world. OFS has the equipment and the know-how to perform on-site oil flushing and oil reclamation services, as well as on-site fluid analyses. Compressor systems are common applications and OFS crews can complete systems within hours.

PLANT APPLICATIONS:

Compressor Lube Systems
Heat Transfer Systems
Main Turbine Lube Oil Reservoirs
Boiler Feed Pump Lube Oil
Speed Control Hydraulic Systems
Force Draft Fan Bearing Lube Systems
Hydraulic Power Units
Gear Boxes and Fuel Tanks

O8

OFS

Rental Equipment and Services for Industrial Fluid Purification

OFS maintains a large fleet of rental equipment, ready for deployment anywhere. Additionally, we can provide factory-trained crews to perform oil flushing and filtration services at your plant.

PLANT APPLICATIONS:

Bearing Lube Systems
Boiler Feed Pump Lube Oil
Boiler Lube Systems
Compression Lubricating Oil Compressors
Compressor Lube Systems
Cooling Tower Gear Boxes and Fuel Systems
EHC Speed Control Systems using Fire Retardant Fluids
Force Draft Fan Bearing Lube Systems
Gear Boxes
Generator Belly Tanks
Heat Transfer Systems
Hydraulic Power Units and Fuel Tanks
Hydraulic Systems
Main Fuel Supply to Turbine Generator
Main Fuel Tanks
Main Turbine Lube Oil Reservoirs
Main Turbine Lube Oil Systems
Mixer Lube Systems
Outside Storage Tanks
Polishing of Downstream Hydrocarbons
Power Boilers
Speed Control Hydraulic Systems

A1

Anderson®
AVS and AVGS Vane Separators

Anderson Vane Separators are used in applications where efficient liquid-gas separation is required. Anderson AVS and AVGS Vane Separators utilize the pocket type vane element to efficiently remove liquid contaminant from air and gas streams as well as steam flows. Pocket type vanes provide higher capacity with minimum pressure drop.

PLANT APPLICATIONS:

- Methanol Processing
- C3/C4 Dehydrogenation
- Steam Cracking
- Propylene Recovery
- Catalytic Condensation
- Power Boiler
- Alkylation
- Aromatics Recovery
- Olefin Recovery
- Mixing
- Distillation
- Filtration/Separation

A2

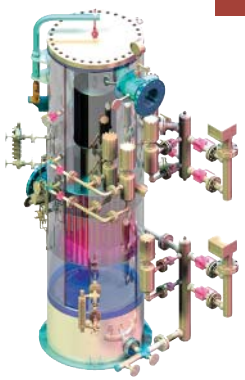
Anderson
AVB Steam Drum Vane Separator

Anderson AVB Steam Drum Vane Separators are designed specifically to provide clean, dry steam. The Anderson AVB Steam Drum Vane Separator utilizes the pocket type vane element to efficiently remove liquid particles from steam flows. This type of separator provides maximum protection for downstream equipment.

PLANT APPLICATIONS:

- Methanol Processing
- C3/C4 Dehydrogenation
- Olefin Cracking
- Steam Cracking
- High Severity FCC
- Propylene Recovery
- Catalytic Condensation
- Power Boiler
- Alkylation
- Reforming
- Naptha Reforming
- Aromatics Recovery
- Isomerization
- Olefin Recovery
- Mixing
- Distillation
- Filtration/Separation

A4



Anderson
ACF Coalescing Filter

The Anderson ACF Coalescing Filter is a two stage device that provides the optimum level of protection for fuel gas equipment by utilizing a first stage mechanical style separator followed by a second stage consisting of the highest efficiency coalescing filter elements available to provide virtually contaminant-free gas to downstream equipment.

PLANT APPLICATIONS:

- Methanol Processing
- C3/C4 Dehydrogenation
- Olefin Cracking
- Steam Cracking
- High Severity FCC
- Propylene Recovery
- Catalytic Condensation
- Power Boiler
- Alkylation
- Reforming
- Naptha Reforming
- Aromatics Recovery
- Isomerization
- Olefin Recovery
- Mixing
- Distillation
- Filtration/Separation

Alkylation

Alkylation is a basic chemical process where an alkyl group is added to another molecule. One example would be the combining of gaseous ethylene and liquid benzene to create ethylbenzene. In more specialty applications, a more complex molecule can then be circulated as the catalyst for other reactions. The reaction takes place in a chemical reactor. This mixture may then be sent to the Alkylation Distillation plant via storage in the tank farm.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters
Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches

Aromatics Recovery

Solvents are used in Aromatic Recovery from petroleum streams. Aromatic Recovery is performed as part of the Extractive Distillation process to facilitate Liquid-Liquid Extraction (LLE).

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters
Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches

C3/C4 Dehydrogenation

This process can be applied to all types and mixtures of C3/C4 LPG feedstocks and employs a chromium oxide on alumina catalyst. Dehydrogenation of propane to polymer-grade propylene takes place in a fixed-bed tubular reactor, in steam reformer based designs. The separation section derives from its ethylene technology.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters
Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches

Catalytic Condensation

The Catalytic Condensation process is the preferred route to olefin dimers and oligemers and is also widely used for the production of cumene. Successful operation of a Catalytic Condensation unit with an SPA catalyst requires a close control on the water balance going into the reactor, both in order to obtain the desired level of activity and to achieve long catalyst life.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters
Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches

Centrifugation

Centrifugation is separation by means of high velocity rotation.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Phaeton XTL Lighting

Crystallization

This process gives crystals the desired shape and structure without the usual problems of polymorphism. One technique involves placing a self-assembled monolayer (SAM) of molecules on a substrate to act as a nucleation catalyst for a specific polymorph.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Eductors

Dehydrogenation

Dehydrogenation involves the elimination of hydrogen from a compound to produce a less saturated analog and can be effected thermally or catalytically. Thermal dehydrogenation is best exemplified by the pyrolysis of hydrocarbons to produce olefins, usually in the presence of steam, in pyrolysis furnaces or steam crackers at elevated temperatures.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Phaeton XTL Lighting

Digester

A digester is a vessel in which various organic compounds, bacteria and other microbials are introduced to promote breakdown and separation of materials into various usable elements and waste.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Eductors

Distillation

Distillation is the most commonly used method of recovering and purifying petrochemicals and chemicals in the processing industry. The difference between boiling points between the key components to be separated is the means for separation.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters

Drying

Drying is the removal of moisture from product using flash dryers, ring dryers, fluidized bed dryers, coolers, rotary dryers and calciners.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Eductors

Evaporation

Many processes in the chemical industry require the vaporization or boiling of multi-component fluids. With Evaporation, (unlike distillation), the vapors are either exhausted or discarded, instead of harvested.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors

Extraction

Extraction in chemistry is a separation process involving the separation of a substance from a matrix. It most often refers to Liquid-Liquid Extraction and Solid Phase Extraction but may also include other techniques such as supercritical extraction, ultrasonic extraction, heat reflux extraction or microwave-assisted extraction.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors

Fermentor

A Fermentor is a vessel in which various organic compounds, bacteria and other microbials are introduced to promote fermentation of materials into various usable elements and waste.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors

Filtration/Separation

Filtration and Separation technologies have a broad range of applications in the material, chemical and hydrocarbon processing and allied industries. Depending on the type and purpose of the process streams being treated, there are diverse devices and process strategies that can be considered.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters

Fluid Handling

Generally, any pipe or tank system transporting or containing fluids, liquid or gas would be considered a Fluid Handler.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors

Heat Transfer

Heat Transfer is the process whereby heat moves from one body or substance to another by radiation, conduction, convection or any combination of these methods.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors

High Severity FCC

High-Severity Fluid Catalytic Cracking (HS-FCC) is a newer process for the conversion of heavy oils into lighter hydrocarbon products and petrochemical feedstocks. The process combines mechanical modifications to conventional FCC with changes in process variables and catalyst formulations. The main operating regime of the process is a special down-flow reactor system, high reaction temperature, short contact time, and high catalyst/oil ratio. HS-FCC processes can yield up to 25% more than conventional riser-type reactor systems.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches
Anderson ACF Coalescing Filters
Anderson AVB Steam Drum Vane Separators

Isomerization Plant

The chemical process by which a compound is transformed into any of its isomeric forms, i.e., forms with the same chemical composition but with different structure or configuration and, hence, generally with different physical and chemical properties. An example is the conversion of butane, a hydrocarbon with four carbon atoms joined in a straight chain, to its branched-chain isomer, isobutane, by heating the butane to 100°C or higher in the presence of a catalyst.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches
HYCOA Liquid Filtration
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters

Kiln

A Kiln is a furnace or oven for burning, baking or drying something, especially one for firing pottery, calcining limestone or baking bricks.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows

Lubrication Systems

Rotating equipment used throughout a facility has Lubrication Systems for bearings and the many types of mechanical seals employed.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jerguson Glass Level Gages
Jerguson Magnetic Level Gages
HYCOA Liquid Filters
OFS Vacuum Dehydration Oil Purification Systems
OFS Filter Carts and Low Flow Filtration Systems
OFS Oil and Fuel Purification and Flushing Services
OFS Varnish Removal Systems
OFS High Flow Filtration Systems
OFS Filter Vessels
OFS Rental Equipment

Methanol Processing

Methanol is an important multipurpose base chemical which can be recovered from many resources, predominantly natural gas. By tradition, methanol is principally used to produce formaldehyde, methyl tertiary butyl ether (MTBE) and acetic acid. It is occasionally used as a general solvent. Today, methanol is projected to be increasingly used as a fuel, so a comparison to LNG could be made. Like LNG, methanol is manufactured from natural gas, but with higher capital costs per unit of energy. However, it is easier and cheaper to transport.

CLARK-RELIANCE PRODUCTS EMPLOYED:

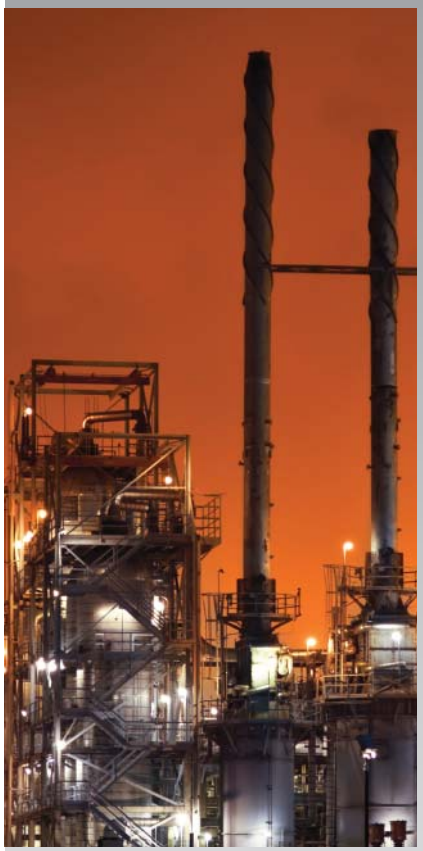
Jerguson Glass Level Gages
Jerguson MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Flow Indicators
FILCOA Gas Filters & Coalescing Elements
FILCOA Liquid Filters
Anderson AVB Steam Drum Vane Separators
Anderson AVS and AVGS Vane Separators
Anderson ACF Coalescing Filters

Mixing

Mixing is the combining of multiple fluids (liquid or gas) in various ways to achieve a desired solution, mixture, or blend. Mixing can be done within pipe lines, tanks, reactors and other vessels.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
Jacoby-Tarbox Eductors
Anderson AVS and AVGS Vane Separators
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters



Naptha Reforming

Naptha Reforming is the most widespread process for rearranging hydrocarbon molecules. One method, thermal reforming, employs temperatures of 510°–565°C (950°–1,050°F) at moderate pressures (about 43 kg per sq cm, or 600 psi) to obtain gasolines with higher octane numbers.

CLARK-RELIANCE PRODUCTS EMPLOYED:

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Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches
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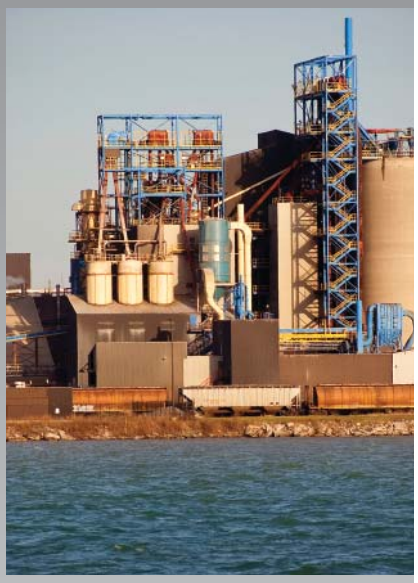
Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters

Olefin Cracking

Olefin Cracking and interconversion processes are being developed to boost light olefins output. Typically, they can convert C4-C8 olefins and light pyrolysis gasoline into ethylene and propylene. Newer catalytic processes are under development that provide enhanced control of the cracking process or permit catalytic dehydrogenation of ethane.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
FILCOA Gas Filters and Coalescing Elements
FILCOA Liquid Filters
Anderson AVB Steam Drum Vane Separators
Anderson ACF Coalescing Filters



Olefin Recovery

Petrochemical plants and refineries use distillation to separate olefins, e.g., ethane/ethylene, propane/propylene, and butane/butene. The columns used for olefin separation are often referred to as splitters.

CLARK-RELIANCE PRODUCTS EMPLOYED:

- Jerguson Glass Level Gages
- Jerguson Model MGWR Gages
- Jerguson Displacer Level Transmitters
- Jerguson Magnetic Level Gages
- Jerguson External Cage Level Switches
- Jacoby-Tarbox Sight Windows
- Jacoby-Tarbox Sight Flow Indicators
- Jacoby-Tarbox Phaeton XTL Lighting
- Anderson AVS and AVGS Vane Separators
- Anderson AVB Steam Drum Vane Separators
- Anderson ACF Coalescing Filters

Power Boiler

Power Boilers are used to generate the steam required for plant processes or for the production of plant power. These Power Boilers are generally designed and manufactured to meet the requirements of the ASME Boiler Code or applicable Boiler Code for the country of installation.

CLARK-RELIANCE PRODUCTS EMPLOYED:

- Anderson AVS and AVGS Vane Separators
- Anderson AVB Steam Drum Vane Separators
- Anderson ACF Coalescing Filters
- OFS Rental Equipment
- Reliance Electro Eye-Hye Remote Drum Level Indication Systems
- Reliance Levalarms
- Reliance Water Columns and Standpipes
- Reliance Water Gage Glasses

Propylene Recovery

Formerly an unrecovered bi-product of ethylene production, propylene now accounts for 30% to 40% of production depending on the feedstock. Increased consumer demand is increasing the production, however modifying processes to maximize propylene production typically decreases gasoline quality.

CLARK-RELIANCE PRODUCTS EMPLOYED:

- Jerguson Glass Level Gages
- Jerguson Model MGWR Gages
- Jerguson Displacer Level Transmitters
- Jerguson Magnetic Level Gages
- Jerguson External Cage Level Switches
- Jacoby-Tarbox Sight Windows
- Jacoby-Tarbox Sight Flow indicators
- Jacoby-Tarbox Phaeton XTL Lighting
- Anderson AVS and AVGS Vane Separators
- Anderson AVB Steam Drum Vane Separators
- Anderson ACF Coalescing Filters

Recovery

Generally, any process whereby a secondary product can be harvested during the production of a primary material and be used or sold is classified as a recovery process, and the secondary product is a recovered item.

CLARK-RELIANCE PRODUCTS EMPLOYED:

- Jacoby-Tarbox Sight Flow Indicators
- Jacoby-Tarbox Phaeton XTL Lighting
- Jacoby-Tarbox Sight Windows

Reforming

Catalytic Reforming is a chemical process used to convert petroleum refinery napthas, typically having low-octane ratings, into high-octane liquid products called reformates, which are components of high-octane gasoline.

CLARK-RELIANCE PRODUCTS EMPLOYED:

- Jerguson Glass Level Gages
- Jerguson Model MGWR Gages
- Jerguson Displacer Level Transmitters
- Jerguson Magnetic Level Gages
- Jerguson External Cage Level Switches
- Jacoby-Tarbox Sight Windows
- Jacoby-Tarbox Sight Flow indicators
- Jacoby-Tarbox Phaeton XTL Lighting
- Anderson AVS and AVGS Vane Separators
- Anderson AVB Steam Drum Vane Separators
- Anderson ACF Coalescing Filters

Size Reduction

There are two main categories of Size Reduction, crushing and grinding. One or the other is practiced in almost every segment of the chemical processing industry. This is done to expose the grains of the material in the ore.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
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Jacoby-Tarbox Eductors

Smelter

Smeltering introduces heat necessary to extract metal from an ore and, in some cases, remove oxygen. Secondary materials may be used as a catalyst.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows

Splitting

Splitting is another term for distillation in petrochemical processing. The separation of naptha from low-sulfur gasoil is one example.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jerguson Glass Level Gages
Jerguson Model MGWR Gages
Jerguson Displacer Level Transmitters
Jerguson Magnetic Level Gages
Jerguson External Cage Level Switches

Steam Cracking

Two phases of Steam Cracking technology include cracking furnaces and separation. Cracking furnaces are the most important process units within ethylene plants. Here the thermal cracking reactions take place and the product yield of the entire plant is defined. The process to produce ethylene is one of the most complex processes in industry. Due to the huge number of components produced by thermal cracking the feedstock, various separation steps are required to produce the desired quality of ethylene and other possible byproducts.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows
FILCOA Liquid Filters
FILCOA Gas Filters and Coalescing Elements
Anderson AVB Steam Drum Vane Separators
Anderson AVS and AVGS Vane Separators
Anderson ACF Coalescing Filters

Waste Management and Treatment

The scope of Waste Management and Treatment now includes both hazardous and non-hazardous waste. The processes may include stabilization, neutralization, dilution, solidification, evaporation, storage, handling, transportation and disposal.

CLARK-RELIANCE PRODUCTS EMPLOYED:

Jacoby-Tarbox Sight Flow Indicators
Jacoby-Tarbox Phaeton XTL Lighting
Jacoby-Tarbox Sight Windows

Industry Guide to Products for

CHEMICAL PROCESSING

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