Sundyne

Pumps & Compressors for Energy & Petrochemical Applications

Sundyne Pumps

Sundyne Compressors

ANSIMAG Sealless Pumps

HMD Kontro Sealless Pumps

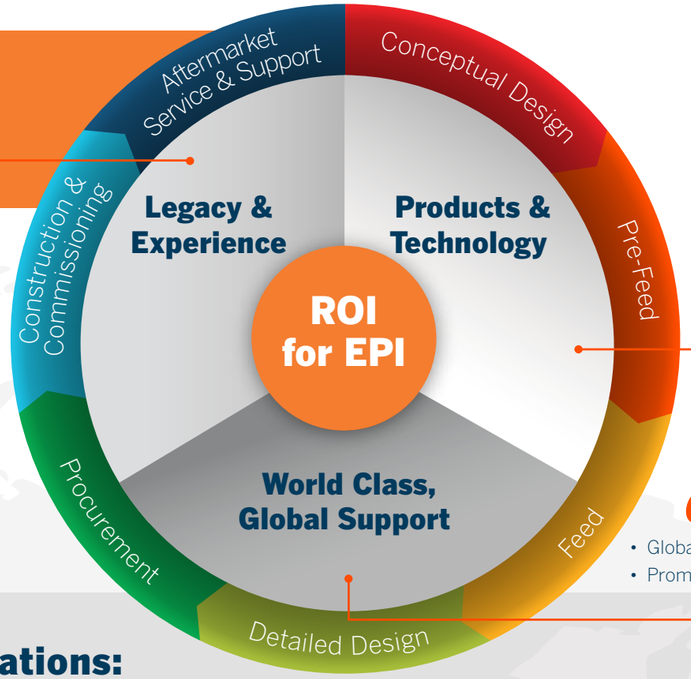
Marelli Bombas

PPI Diaphragm Compressors

SUNFLO®

Sundyne's Legacy, Innovation and Total Lifecycle Value
to the Energy and Petrochemical Industries

The broad Sundyne product portfolio of pumps & compressors addresses a wide range of EPI applications. The unique Sundyne combination of technology, expertise and support provides a 360 degree, full lifecycle service that spans everything from project pre-feed to comprehensive 24x7 support utilizing a global network of Authorized Service Centers and aftermarket specialists.



- Originators of Low Flow High Head pumps & compressors
- Invented sealless mag-drive technology
- Pioneered ETFE pump linings

- Pumps & Compressors
- Performance & Reliability

- Global Team
- Prompt, Local Support

The Right Technology for your EPI Applications:

ANSIMAG ETFE-Lined Magnetic Drive Sealless Pumps

HMD Kontro Metallic Sealless Magnetic Drive Pumps

Sundyne High Head Low Flow Process Pumps

Marelli Heavy Duty API 610 Centrifugal Pumps

Sundyne High Head Low Flow Multi-Stage Process Pumps

Sundyne Centrifugal Integrally-Geared Single-Stage Compressors

Sundyne Centrifugal Integrally-Geared Multi-Stage Compressors

PPI Diaphragm Compressors

A Legacy of Expertise and Innovation:

1947
HMD Kontro pioneers the world's first Sealless Magnetic Drive Pump.

1954
Marelli Pumps start manufacturing API 610, 1st edition pumps.

1961
PPI introduces triple diaphragm compressor construction with elastomeric seals.

1963
Sundyne pioneered the inline-mounted design for the world's first high-head, low-flow centrifugal pump.

1965
Two years later, compressor designs utilizing high-speed pump gearboxes were created with impeller configurations suitable for gases.

1985
Ansimag begins manufacturing magnetic drive pumps and successfully commercializing rotolining of ETFE casings to reduce cost and increase reliability.

1994
Sundyne acquired HMD Kontro to add sealless pumps to the portfolio.

1998
Sundyne acquired ANSIMAG, the pioneers of the world's first ETFE-lined Sealless Magnetic Drive Pump.

2002
Sundyne helped write the API-617 standard for integrally geared compressors.

2008
Sundyne acquired Marelli Pumps to enhance its line of heavy duty, API-610 centrifugal pumps.

2013
Sundyne adds PPI Diaphragm Compressors to its portfolio of products.

2020
Sundyne partners with Warburg Pincus to accelerate growth and enhance business opportunities.

Energy & Petrochemical Applications that Require Pumps & Compressors

Refining

Sundyne pumps are specifically engineered for high-head, low-flow, heavy-duty services. They're commonly deployed as booster pumps, bottoms pumps, reflux pumps and condensate pumps in reformer, hydrotreater, hydrocracker and isomerization process units. Sundyne's centrifugal integrally-geared compressors are deployed in refineries to compress hydrocarbons, hydrogen, H_2S and critical gas mixtures, for applications such as dehydration, catalyst regeneration, reactor injection, fuel gas boost and others.

Power Generation

Boilers heat water to generate steam for turbines and generators to make electricity. Sundyne pumps move water through various stages in the process. Vertically Suspended (VS) pumps move raw intake water. High pressure centrifugal pumps feed boilers (at exceedingly high temperatures). High Head, Low Flow pumps are used for NOx Suppression, and they're also used as condensate pumps, to move water into deaerators before it is recycled to the boiler. Sundyne Centrifugal compressors are used to boost pipeline pressures up to the levels required by large gas turbines.

Petrochemical

Petrochemicals are organic chemicals derived from oil and gas via hydrocarbon cracking and chemical processing. Petrochemical plants are typically located near or within refineries, to take advantage of produced feedstocks. These feedstocks, such as ethylene, propylene, methanol, hydrogen and aromatic hydrocarbons, are used to generate thousands of polymeric chemicals for industrial and consumer use. Sundyne pumps & compressors are widely used for petrochemical processing because they meet exacting API, ISO and ASME standards for safety, reliability and efficiency.

Midstream Gas

Natural gas is a critical feedstock for refining, petrochemical production and power generation. Often times, natural gas and oil are found together in the same reservoir, so processing activities begin at the wellhead by removing contaminants. Common midstream processing applications include: Amine Treating to remove acid gas; Cryogenic distillation to separate NGLs; and fractionation to remove heavier hydrocarbons.

LNG

Natural Gas condenses to LNG at a temperature of -260°F (-160°C), and water freezes at just 32°F (0°C). Wet natural gas must be dehydrated in Molecular Sieve Dehydration units to separate water from gas, and to prevent ice from forming.

H_2 Processing, Transportation and Storage

As every industry seeks to lower its carbon footprint, the interest in using Hydrogen continues to increase. Hydrogen is a versatile energy carrier, and it can be stored for extended periods of time, which makes it a valuable complement to other renewable sources in the electricity system. Sundyne's PPI compressors are specifically designed to compress H2 from low pressure levels up to the levels required by numerous applications, and Sundyne's centrifugal compressors are widely used in refineries and petrochemical plants to recycle hydrogen and to compress a wide range of critical gases.

CCUS

CO_2 Capture: CO_2 is separated from other gases produced when using fossil fuels for electricity generation and other industrial processes (power stations, petrochemical industries, refineries, etc...). The CO_2 released by industries is often very low in concentration; separation methods are needed to be able to specifically capture CO_2.

Amine Scrubbing: The technology uses an amine solvent to scrub CO_2 from the flue gas. The flue gas is initially fed into an absorption column, where the solvent selectively removes the CO_2. The CO_2-rich solvent is then fed into a desorber column, where it is heated to release the CO_2, which is captured before being sent for geological storage or onward use.

Acid Gas Removal Units (AGRU) remove inert gases (such as CO_2, hydrogen sulfide and nitrogen) from unprocessed natural gas prior to sale or use. Different AGRU options include amine sweetening, molecular sieves and membrane systems.

Renewables

Electrolyzers require pumps to move water, and also to pump caustic chemicals which are required to increase the pH of the water in the electrolyzer. Lithium Ion Batteries require chemical polymers (pumped by sealless pumps) to coat electrodes. Solar farms require circulation pumps. And renewable diesel refining requires pumps & compressors to move a wide range of feedstocks.

Sundyne Products

	SUNDYNE COMPRESSORS			SUNDYNE PUMPS												
	Sundyne Compressors	Sundyne Compressors	PPI	Sundyne Process Pumps	Sundyne Process Pumps	Sundyne Process Pumps	Marelli Bombas	Marelli Bombas	Marelli Bombas	Marelli Bombas	HMD Kontro	HMD Kontro	HMD Kontro	HMD Kontro	ANSIMAG	SUNFLO
	 Fit-for-Purpose Line Mounted Centrifugal Compressors	 API 617 Centrifugal Multi-Stage Compressors	 Diaphragm Compressors with API 618 Option	 API 610 OH3, OH5 Direct Drive Pumps	 API 610 OH6 Integrally Geared Pumps	 HMP Horizontal Multi-Stage Pumps	 API 610 BB1, BB2, BB3 / ISO Centrifugal Pump	 API 610 OH2	 General Duty Process ISO Chemical Pumps	 API 610 VS1, VS2, VS4, VS6 / ISO Vertically Suspended Pumps	 General Service Petroleum API 685 OH2, OH4 Sealless Mag Drive Pump	 General Transfer Sealless Mag Drive Pumps	 Chemical Service ASME/ISO Sealless Mag Drive Pumps	 High Pressure ASME/API 685 Sealless Mag Drive Pumps	 Sealless Mag Drive ETFE ANSI/ISO Pumps	 Industrial Grade Centrifugal Pumps
Refining	Sundyne Compressors			Sundyne Pumps												
Alkylation	✓	✓		✓	✓		✓	✓		✓	✓			✓	✓	
Distillation					✓		✓	✓		✓	✓			✓		
Hydro-Treating	✓	✓			✓		✓	✓		✓	✓			✓		
Hydro-Cracking	✓	✓			✓		✓	✓		✓	✓			✓		
Sour Water				✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	
Catalytic Reforming	✓	✓			✓		✓	✓		✓	✓			✓		
Isomerization	✓	✓			✓		✓	✓		✓						
Wash Water Injection					✓	✓	✓	✓		✓	✓	✓	✓	✓		
Petrochemicals	Sundyne Compressors			Sundyne Pumps												
Olefins (Propylene, Ethylene)	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Aromatics (Benzene, Toluene, Xylene)	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Hydrocarbons (Methane, Ethane, Propane, Butane)	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Terephthalic Acid/ Water Slurry	✓	✓	✓	✓	✓	✓										
Wash Water				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Ammonia	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Carbamate						✓					✓	✓	✓	✓		
Urea	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	
Difficult to Seal Liquids/Gases			✓								✓	✓	✓	✓	✓	
Gas Processing	Sundyne Compressors			Sundyne Pumps												
Hydrogen Processing	✓	✓	✓						✓		✓			✓		
Hydrogen Refueling			✓								✓			✓		
Glycol Dehydration	✓								✓		✓	✓	✓	✓		
Ammonia	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓		
Recycle Gas	✓	✓														
Fuel Gas Boost	✓	✓														
Power-to-X	✓	✓	✓				✓	✓	✓	✓	✓				✓	✓
CO_2 Injection	✓	✓	✓			✓	✓	✓								
Sustainable Energy	Sundyne Compressors			Sundyne Pumps												
CO_2 Capture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
CO_2 Storage	✓	✓	✓													
Renewable Diesel/ Jet Fuel	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Electrolyzers			✓						✓		✓	✓	✓	✓	✓	
NOx Suppression				✓		✓										✓
Amine Scrubbing	✓	✓		✓		✓	✓			✓	✓	✓	✓	✓	✓	✓
Battery Production			✓								✓	✓	✓	✓	✓	
Lithium Ion Battery Production			✓						✓		✓	✓	✓	✓	✓	
Bio-diesel/Ethanol	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	

Sundyne Products

API 617, 618 Centrifugal & Diaphragm Compressors for EPI Applications

Compressors are the heart of hydrocarbon processing or CPI applications – because their reliability directly impacts productivity & efficiency. NACE-compliant Sundyne compressors handle the most difficult gas processing conditions. Sundyne compressors can be built specifically to meet API and NACE standards, and each package is designed to provide pulsation & vibration free operation while delivering oil-free gas compression with zero emissions.

Sundyne Compressors

PPI by Sundyne

Single- & Multi-Stage Compressor Applications

- Mole sieve dehydration
- Acid Gas Removal Unit
- Waste gas and Vapor Recovery Unit
- Specialty chemical production
- Olefins & Polyolefins
- LNG & NGL
- Ammonia
- CO_2 Capture
- H_2 make-up and recycle
- Fuel Gas and Boil-Off Gas

PPI Diaphragm Compressor Applications

- Hydrogen Processing
- Hydrogen Fuel Cells
- Specialty chemical production

Performance Characteristics:

	Product	Flow	Pressure	Max Speed	Temperature
Single-Stage Centrifugal Compressors					
	**Sundyne LMC** Line Mounted Vertical Integrally Geared Compressors	3,550 acfm (6,000 am³/hr)	1,450 psi (100 bar)	34,200 rpm	-200 to 500°F (-130 to 260°C)
	**Sundyne BMC** Base Mounted Integrally Geared Compressors	3,550 acfm (6,000 am³/hr)	1,450 psi (100 bar)	34,200 rpm	-200 to 500°F (-130 to 260°C)
Multi-Stage Centrifugal Compressors					
	**LF 2000** API 617 ISO 10439 Integrally Geared Multi-Stage (1-6) Compressors	10,000 acfm (17,000 am³/hr)	5,000 psi (350 bar)	42,000 rpm (60 Hz), 42,000 rpm (50 Hz)	-200 to 500°F (-130 to 260°C)
Diaphragm Compressors					
	**PPI 9X Series** Single- or Multi-Stage Diaphragm Compressors	145 acfm (250 m³/hr)	16,750 psi (1,155 bar)	Up to 450 rpm	Up to 450°F (232°C)

Sundyne vertically configured compressors are ideal for skid packaging, due to their small footprint & unique modular baseplate. Sundyne horizontally configured compressors can provide multi-stage configurations on a single gearbox – saving valuable space while also reducing energy costs. Sundyne gas compressors provide the performance envelope, the feature set, the reliability ratings and the uncompromising efficiency needed to address the Best Efficiency Point (BEP) for any process gas application. They are designed to run continuously from 3 to 7 years without the need for costly maintenance or overhauls.

Sundyne API 610 Direct Drive Pumps Save Space & Bring Unprecedented Reliability to Hydrocarbon Processing Applications

Sundyne direct drive pumps are known for their reliability and space saving design. The direct drive family of vertical inline, single stage, overhung pumps features a close coupled design (OH5) or a separate bearing bracket (OH3) with a flexible shaft coupling to accommodate multiple motor options. Each direct drive pump is designed specifically to handle refining & petrochemical applications at their best efficiency point, in a manner that maximizes reliability and enhances tolerance to normal system variations.

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
	**LMV 803Lr** Ultra-Low NPSH Direct Drive Centrifugal Pump	Up to 800 gpm (182 m³/hr)	1,080 ft (268 m)	400 psi (28 bar)	-200 to 400°F (-129 to 204°C)
	**801 CS** Cartridge Seal Direct Drive Pump	Up to 380 gpm (86 m³/hr)	720 ft (220 m)	875 psi (60 bar)	-40 to 300°F (-40 to 149°C)
	**LMV 801** Direct Drive Pump	Up to 380 gpm (86 m³/hr)	720 ft (220 m)	1000 psi (69 bar)	-200 to 650°F (-130 to 340°C)

Each pump in the series features a single-stage centrifugal design with single, double or tandem seal arrangements as well as select API 682 cartridge seal configurations for reliable service in the most difficult applications.

Sundyne Pumps

Common Sundyne OH3 and OH5 Pump Applications

- Acid feed
- Acid recirculation
- Olefin charge
- De-propanizer charge
- Propylene feed
- Reflux pumps
- Overhead
- Sour water
- Wash down
- Bottoms pumps

Sundyne Products

Sundyne Heavy Duty Single & Multi Stage Integrally Geared API Pumps

Sundyne API 610, OH6 Integrally Geared Pumps are engineered for critical high-head, low-flow, heavy-duty services required in the hydrocarbon processing and refining & petrochemical industries. Sundyne's unique design optimizes efficiency, curve shape, NPSH, runout horsepower and radial loading to provide economical & reliable operation through various combinations of impeller, diffuser and inducer geometry. Available in vertical or base-mounted configurations, Sundyne's single-stage integrally-geared pumps offer multi-stage performance from a single-stage unit. For higher heads or flows than a single stage pump can deliver, Sundyne offers the multi-stage integrally geared HMP pumps.

Sundyne Pumps

Single–Stage Pump Applications

- Acid feed
- Acid recirculation
- Olefin charge
- De-propanizer charge
- Propylene feed
- Reflux pumps
- Overhead
- Sour water
- Wash down
- Bottoms pumps

Multi-Stage Pump Applications

- Fertilizer
- PTA-Purified Terephthalic Acid
- Urea
- Wash Water
- Propylene

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
Single-Stage Integrally Geared					
	**LMV 3XX OH6** Integrally Geared Pump	Up to 1,040 gpm (236 m³/hr)	6,300 ft (1,921 m)	1000 psi (69 bar)	-200 to 650°F (-130 to 340°C)
	**BMP 338** Integrally Geared Pump	Up to 1,100 gpm (250 m³/hr)	2800 ft (854 m)	500 psi (34 bar)	200 to 650°F (-130 to 340°C)
Multi-Stage Integrally Geared					
	**HMP 7000** Multi-Stage Integrally Geared Pump	Up to 1,800 gpm (410 m³/hr)	14,500 ft (4,420 m)	1000 psi (69 bar)	-200 to 500°F (-130 to 260°C)

Sundyne API 610 heavy duty multi-stage integrally-geared pumps are engineered for extremely high-head services, such as processing **fertilizer**, **PTA** and **urea**. Unlike conventional multi-stage pumps, Sundyne computer tailored hydraulics place the B.E.P. at the rated point – resulting in optimum efficiency, minimum recirculation and minimum vibration. An added benefit is reduced end-of-curve horsepower, allowing for reduced driver size and a smaller footprint.

Marelli Heavy Duty API 610 and ISO Process Pumps

Process engineers utilize Marelli heavy duty API pumps for petrochemical applications requiring high-pressure and/or high flow. The pumps are efficiently designed to save energy and meet exacting API 610 and ISO 13709 standards for overhung, between-bearings and vertically-suspended centrifugal pumps. Marelli multi-stage pumps are capable of reaching flow rates as high as 66,000 gpm (15,000 m³/hr) with high pressures.

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
	**API 610 OH2** Horizontal Single or Double Volute Centrifugal Pump Centerline Mounted	Up to 7,000 gpm (1,280 m³/hr)	1,200 ft (265 m)	551 psi (38 bar)	-238 to 842°F (-150 to 450°C)
	**API 610 BB1** Centrifugal Pump Axially Split Case 1 or 2 stages	Up to 27,298 gpm (4,905 m³/hr)	600 ft (200 m)	130 psi (9 bar)	-22 to 302°F (-30 to 150°C)
	**API 610 BB2** Centrifugal Pump Radially Split Case 1 or 2 stages	Up to 13,208 gpm (2,300 m³/hr)	1,640 ft (350 m)	290 psi (20 bar)	-22 to 752°F (-30 to 400°C)
	**API 610 BB3** Multi-stage Centrifugal Pumps	Up to 2,460 gpm (600 m³/hr)	4,260 ft (1,300 m)	232 psi (16 bar)	-40 to 410°F (-40 to 210°C)
	**ND Model** ISO 5199/2858	Up to 5,468 gpm (1000 m³/hr)	680 ft (150 m)	290 psi (20 bar)	-58 to 480°F (-50 to 250°C)
	**API 610 VS1, VS2, VS4, VS6** Vertically Suspended, Single/Double Volute Single or Multistage Centrifugal Pumps	Up to 13,280 gpm (2,400 m³/hr)	1,640 ft (350 m)	290 psi (20 bar)	-22 to 752°F (-30 to 400°C)

Originally manufactured under the Marelli Bombas brand in Spain, these pumps feature rugged and low vibration balanced rotor designs. The global installed base of Marelli pumps is more than 10,000 units, and many have been running for decades.

Marelli Pumps are Well-Suited to Petrochemical Applications:

- Designed for higher efficiency, with a wide variety of hydraulics to match exact duty points.
- Highly maintainable and replaceable wear rings to reduce overall life cycle costs.
- Multiple impeller options in each hydraulic pump casing for maximum efficiency.
- Labyrinth bearing seals to avoid external contamination and to maximize seal life.
- Wide variety of instrumentation options for monitoring key operational parameters.

Marelli Bombas by Sundyne

Petrochemical Applications

- Hydrocracking
- Topping
- Gas Condensate
- HDS
- Merox LPG
- Amine
- Sour Water Stripper
- Coker
- Tank Farms
- Fertilizers
- Oil fields and terminals
- Synfuels

Chemical & Industrial Applications

- Raw Water Intake
- Desalination
- Reverse osmosis
- Condensate Extraction
- Boiler Feed Water
- Cooling Towers
- Irrigation
- Water Transfer

Sundyne Products

HMD Kontro Sealless Magnetic Drive Pumps Meet API 685 Standards

As the innovators of magnetic drive pumps and with nearly 40 years of experience in the supply of pump units to API standards, Sundyne HMD Kontro offers a broad range of horizontal and vertical sealless pumps that provide full compliance to the API 685 Sealless Centrifugal Pump standard. With a wide choice of design configurations and metallurgies available, Sundyne HMD Kontro API 685 pumps meet the requirements of a variety of challenging pump application.

Sundyne Pumps

HMD Kontro Sealless Pumps by Sundyne

Applications – The Right Choice for Light Hydro-Carbons

- Feed pumps
- Booster pumps
- Bottoms pumps
- Wash water pumps
- Reflux pumps
- Condensate pumps
- Alkylation
- Amine Scrubbing
- Ammonia
- Battery Production
- Carbamate
- Distillation
- Hydro-Cracking
- Urea

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
	**HMD Kontro GSP** Horizontal OH2 Metallic Sealless API 685	Up to 3,084 gpm (700 m³/hr)	Up to 790 ft (240 m)	580 psi (40 bar)	-148 to 660°F (-100 to 350°C)
	**HMD Kontro HPGSP** Horizontal OH2 High Pressure Metallic Sealless API 685	Up to 1275 gpm (290 m³/h)	Up to 490 ft (150 m)	2680 psi (185 bar)	-148 to 400°F (-100 to 260°C)
	**HMD Kontro GSPV** Vertical OH4-style Metallic Sealless API 685	Up to 1,035 gpm (235 m³/hr)	Up to 295 ft (90 m)	580 psi (40 bar)	-40 to 400°F (-40 to 205°C)
	**LMV-801S** Vertical OH4-style Low-Flow Metallic Sealless API 685	Up to 380 gpm (86 m³/hr)	720 ft (220 m)	580 psi (40 bar)*	-148 to 400°F (-100 to 205°C)
	**HMD Kontro GSPLF** Horizontal OH2 Low-Flow Metallic Sealless API 685	Up to 160 gpm (36 m³/hr)	Up to 720 ft (220 m)	580 psi (40 bar)	-148 to 660°F (-100 to 315°C)
	**HMD Kontro GSPX** Horizontal BB5 Multi-Stage Metallic Sealless API 685	Up to 450 gpm (103 m³/hr)	Up to 1400 ft (426 m)	580 psi (40 bar)	-40 to 500°F (-40 to 260°C)

These pumps are specifically engineered to eliminate emissions and improve personnel safety without compromising high performance and industry leading reliability. With a number of different material and customization options available, including Secondary Control and Containment and also the high efficiency non-metallic Zeroloss containment shell, HMD pumps offer a leak-free and environmentally friendly pumping solution with minimal ongoing maintenance requirements.

Safer for Employees & Better for the Environment:

With magnetic drive sealless pumps, there are no leaks or emissions to the atmosphere. This reduces the need for EPA monitoring and reduces health & safety risks to plant personnel. Reducing the probability of accidents and emissions also reduces a plant's liability, which can help to reduce insurance costs. Sealless pumps offer a cleaner working environment and greater peace-of-mind when it comes to EH&S (Environmental Health & Safety).

The Best Choice for the Bottom Line:

Sealless magnetic drive pumps save time & money – before, during and after installation. With sealless pumps, commissioning is quicker. Once up & running, maintenance activities are reduced because seal changes are eliminated. This enables skilled labor to be allocated to other priorities, which helps to further reduce plant downtime. Spare parts inventories can also be downsized, because seals & parts for seal support systems do not need to be stocked.

HMD Kontro Sealless Magnetic Drive Pumps Meet all ISO and ASME Pump Standards

Since 1947, HMD Kontro has been recognized as the pioneer of sealless pump engineering and manufacturing. For the safe and efficient transfer of toxic, corrosive, carcinogenic and aggressive liquids, a wide range of HMD Kontro Sealless Magnetic Drive Pumps are available in a stainless steel design with silicon carbide internal bearings, which enables them to withstand extremely high temperatures. Additional material options such as Alloy 20, Alloy C22, Duplex and Titanium are also available on request. Pumps designed for chemical processing and general industrial applications include:

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
	**GTA/GTI** Horizontal Metallic Sealless General Transfer	Up to 115 gpm (26 m³/hr)	Up to 125 ft (38 m)	275 psi (18.9 bar)	-40 to 500°F (-40 to 260°C)
	**CSA/CSI** Chemical Service	Up to 340 gpm (77 m³/hr)	Up to 296 ft (90 m)	275 psi (18.9 bar)	-40 to 500°F (-40 to 260°C)
	**GSA/GSI** Horizontal Metallic Sealless Engineered General Service	Up to 1420 gpm (320 m³/hr)	Up to 485 ft (150 m)	275 psi (18.9 bar)	-40 to 600°F (-40 to 315°C)
	**HPGS** High Pressure General Service	Up to 317 gpm (72 m³/hr)	Up to 305 ft (93 m)	2,680 psi (185 bar)	-40 to 500°F (-40 to 260°C)
	**SPGS** Horizontal Metallic Sealless Self-Priming	Up to 200 gpm (45 m³/hr)	Up to 170 ft (52 m)	145 psi (10 bar)	-40 to 248°F (-40 to 120°C)

Pumping toxic chemicals presents health & safety risks to personnel and the environment. HMD sealless pumps are designed to handle hazardous, toxic, corrosive and aggressive liquids with zero leaks or emissions. HMD pumps are easy to maintain, have fewer working parts, no potential leak paths and no seal support systems to maintain. Maintenance is simple, and lifecycle costs are lower than mechanical sealed pumps. HMD pumps meet all industrial regulations, including ISO, API, ASME, ANSI, DIN and ATEX.

HMD Kontro Pumps Offer a Range of Benefits:

- **Total Product Containment** – no leaks or emissions improving operator safety and environmental protection.
- **No seals or seal support systems to replace or maintain** – reduces total lifecycle costs.
- **High efficiency hydraulics** – covers a wide range of duty requirements.
- **Maximized component interchangeability** – minimizes parts inventory.
- **Small footprint** – close-coupled options available across all CPI pump ranges.
- **Easy to install, commission, operate and maintain** with no requirements for special tools.
- **Secondary Control & Containment options available** for enhanced protection in highly hazardous applications.
- **High corrosion resistance with standard 316SS construction with alternative metallurgies** available on request to meet specific application needs.
- **Robust construction and fully encapsulated magnets** ensuring longevity in extreme pumping environments.
- **Compliance to industry standards** including ASME B73.3, ISO 2858 and IECEx.
- **Zeroloss Shell option available for selected pump ranges** to increase efficiency and reduce running costs.

HMD Kontro Sealless Pumps by Sundyne

Chemical Processing:

- Chlor-Alkali
- Pesticides
- Insecticides
- Herbicides
- Fertilizer
- Solvents
- Isocyanates

Water/Wastewater Treatment:

- Sodium hypochlorite
- Sodium hydroxide
- Sulfuric acid
- Ferric Chloride

Battery Manufacturing:

- Sulfuric acid
- Potassium hydroxide
- NMP

Other Industries:

- Mining (Sodium Cyanide, Sulphuric Acid, Hydrochloric Acid)
- Pharmaceuticals (Vaccine Production, Heat Transfer)

Sundyne Products

ANSIMAG Sealless Magnetic Drive ETFE Lined Pumps for Safe Chemical Processing

ANSIMAG sealless magnetic drive pumps are specifically designed for chemical processing applications. All wetted parts are molded fluoropolymer materials combined with SiC (Silicon Carbide) bearings that safely handle a wide range of corrosives and solvents (up to 250°F/121°C) without corrosion. A patented, fully Encapsulated Mag Drive hermetically seals the inner magnets to isolate them from process fluid and maintain magnet integrity for the life of the unit. A fiber reinforced vinyl ester shell delivers unprecedented reliability.

ANSIMAG by Sundyne

Chemical Processing:

- Chlor-Alkali
- Pesticides
- Insecticides
- Herbicides
- Fertilizer

Water/Wastewater Treatment:

- Sodium hypochlorite
- Sodium hydroxide
- Sulfuric acid
- Ferric Chloride

Battery Manufacturing:

- Sulfuric acid
- Potassium hydroxide
- NMP

Other Industries:

- Mining (Sodium Cyanide, Sulphuric Acid, Hydrochloric Acid)
- Pulp & Paper (Chlorine, Sulphuric Acid)

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
	**ANSIMAG K+**	Up to 675 gpm (153 m³/hr)	Up to 320 ft (97 m)	285 psi (19.6 bar)	-20 to 250°F (-29 to 121°C)
	**ANSIMAG KF**	1,470 gpm (334 m³/hr)	520 ft (110 m)	350 psi (24 bar)	-20 to 250°F (-29 to 121°C)
	**ANSIMAG KV** Vertical	325 gpm (74 m³/hr)	325 ft (69 m)	285 psi (19.6 bar)	-20 to 250°F (-29 to 121°C)
	**ANSIMAG KP** Self-priming	285 gpm (65 m³/hr)	150 ft (32 m)	285 psi (19.6 bar)	-20 to 250°F (-29 to 121°C)
	**ANSIMAG ALI** ISO Design	285 gpm (65 m³/hr)	150 ft (32 m)	285 psi (19.6 bar)	-20 to 250°F (-29 to 121°C)
	**ANSIMAG KM**	147 gpm (33 m³/hr)	140 ft (30 m)	150 psi (10.3 bar)	-20 to 250°F (-29 to 121°C)

ANSIMAG pumps are more energy-efficient than mechanically sealed pumps. An innovative rear casing generates no eddy currents thus eliminating heat generation and reducing energy costs. Because ANSIMAG pumps do not have seals – there are no leaks, no emissions and no costs related to seal maintenance.

ANSIMAG Benefits Specific to CPI Applications:

- **Zero Leakage** – Sealless design and a single, fully-contained O-ring eliminates possible leakage.
- **Chemically Resistant Lining** – Carbon Fiber reinforced ETFE is resistant to most chemicals.
- **Secondary Containment** – Lined Fiber/Epoxy containment shell offers unsurpassed pressure handling capability.
- **Corrosion Protection** – Powder Coat exterior is more durable and chemically resistant than Epoxy based paints.
- **Durable Construction** – Ductile iron exterior is designed for heavy-duty chemical applications.
- **Magnetic Drive** – Hermetically seals the inner magnets, isolating them from the process fluid.
- **Fully-Encapsulated Inner Drive** – Provides unsurpassed resistance to chemical attack.
- **Easy Service** – Only 9 wetted parts and a back pull-out design enables service without breaking the wet end.
- **Small Footprint** – Close coupled design offers quiet operation.

Fit-for-Purpose, Industrial Grade Pumps Offer the "Right Pump at the Right Price" for Select EPI Applications

API specifications define safety & reliability standards for process pumps – mostly those used in refineries and petrochemical plants. Pumps adhering to these specifications are more expensive than other pumps, because they're designed for supreme quality and redundancy in many cases. Not every application in a chemical plant requires this level of redundancy, packaging & documentation – and full adherence to API standards can result in a pump that is "over spec'd" for the application. How do operators address the needs for highly reliable, high pressure pumps, without having to pay for all the "bells & whistles" that come with an API pump? The answer is Industrial Grade Pumps.

Performance Characteristics:

	Product	Flow	Head	Pressure	Temperature
	**Sunflo P 3400** Industrial Grade Pump	Up to 550 gpm (125 m³/hr)	Up to 5,280 ft (1,609 m)	350 psi (24 bar)	-50 to 350°F (-46 to 177°C)
	**Sunflo P 3000** Industrial Grade Pump	Up to 500 gpm (114 m³/hr)	Up to 4,200 ft (1,280 m)	350 psi (24 bar)	-50 to 350°F (-46 to 177°C)
	**ANSIMAG KM**	147 gpm (33 m³/hr)	140 ft (30 m)	225 psi (15.5 bar)	-20 to 250°F (-29 to 121°C)
	**SundWASH** High Pressure Wash-down System	Up to 50 wands @7 gpm each (50 X 1.6 m³/hr)		900 psi (62 bar)	

All of the pumps in Sundyne's Industrial, Fit-for-Purpose family leverage Sundyne's field-proven high pressure impeller technology that is optimized to deliver high head. Each pump leverages the legacy of Sundyne's heavy duty API integrally geared pumps to create industrial grade pumps that save energy through efficient high-pressure pumping. The impellers on all of the Sunflo pumps feature unique suction inducer technology, which is optimized to deliver low NPSH and eliminate pump cavitation. These pumps all feature compact footprints, and are readily available for less than the cost of API 610 pumps.

SUNFLO by Sundyne

ANSIMAG by Sundyne

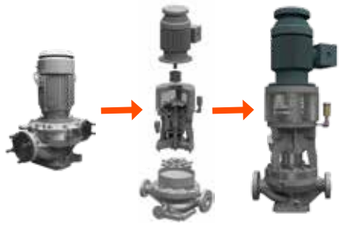
Applications

- Boiler Feed pumps
- Condensate pumps
- Wash water pumps
- Cleaning Systems
- Dust Suppression
- NOx Suppression
- Water Treatment
- pH Control & Disinfection
- EV Battery Production
- Freeze Drier Coolant
- Vaccine Production

24x7, Global Aftermarket Services to Keep Equipment Repaired, Re-Rated & Re-Configured

Sundyne's uncompromising reliability is not just a function of superior design. It's also delivered by high-touch services at commissioning, through planned turnarounds, and at every step of the way to ensure reliable day-to-day operation for years. With manufacturing operations and Authorized Service Centers (ASC) around the globe, Sundyne provides prompt & local support to keep customers up-and-running.

Conversions



- **801 to 801 CS/S (Cartridge Seal/Sealless):** Convert to sealless or upgrade to API 682 cartridge seal.
- **HMP3/5 Upgrade:** Increased reliability using the latest engineered components
- **Gearbox Upgrades**
- **OH2 Drop In Replacements:** API 610 and 682 options. No shutdown / No Piping Changes!
- **OH2 ReFIT Kit:** Upgrade outdated OH2 to 12th Edition API by reusing existing impeller/casings
- **ReRate Conversions**

OEM Parts

- Insure High Quality Standards
- Warranty Protection
- Sundyne Tolerances
- Critical Spares: For quick repairs

Site Surveys

- Free Site Audits by Sundyne engineers at no charge!
- Verify that equipment is running at B.E.P.
- Perform Equipment Health Checks
- Upgrade Options
- Optimize Stock Holding

Upgrade Kits

- **Reliability Assurance Kits:** For simple overhaul/repairs.
- **Reliability Upgrade Kits:** Upgrade your Gearbox to the latest design.
- **Wet End Kits**
- **Critical Spares Kits:** Class I, II, & III

Repairs

- Global 24x7 Coverage, Local Support
- Factory Overhaul & Repair: Arvada, Dijon, Spain and Eastbourne
- Sundyne Expert Repair Specialists
- Authorized Service Centers
- Optional Factory Performance Testing with Extended Run Test, NPSH Test.

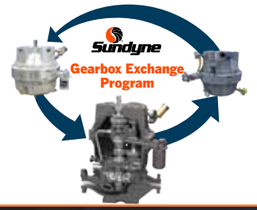
SundSCHOOL

- Maintenance & Operations Arvada, CO USA Factory
- Maintenance & Operations Dijon, France Factory
- On-Site Maintenance & Operations School

Field Service

- Troubleshooting
- Service Agreements
- Start Up Assistance with new and repaired units
- 24x7 Global Support
- In field repairs when possible
- Maximize Up Time

Gearbox Exchange



- Up to 30% Exchange Credit!
- Convenient Streamlined Maintenance Planning
- Lower Lead Time = Greater Uptime
- New gearboxes include all the latest design improvements
- Re-Rate for Better Reliability: During the exchange, Sundyne Engineers can re-rate and establish a new B.E.P.

Sundyne® Aftermarket Services

The Value of Engineered Solutions

Sundyne's engineers have learned a lot over the last 60 years – providing pumps & compressors to thousands of customers in the Energy & Petrochemical Industries. Today, this expertise is applied to pump & compressor designs that are specifically tailored to each customer's application, delivering unmatched performance & reliability.

Comprehensive Portfolio to Address any EPI Application:

- Pumps & compressors
- Industry's widest range of sealless pumps (including HMD & ANSIMAG)
- Sealed pumps in single, double, tandem or cartridge seal configurations
- Metal or ETFE materials of construction
- Sized to deliver any flow or head requirements
- Compact footprints

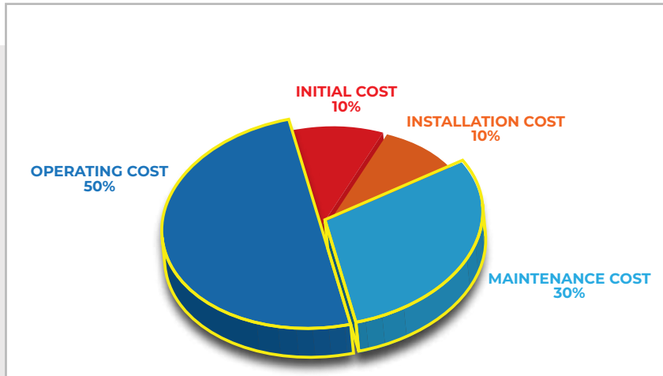
Consultative Selling Approach:

- Sundyne listens carefully to customers
- Identify pain points
- Customized solutions – tailored to each application's flow, head, temperature and corrosion resistance requirements

"Pumping NGLs close to their flash point requires extremely high suction pressures, and Sundyne's Low-Flow High-Head Inducer technology is designed for these types of applications."

Uncompromising Reliability:

- Sized specifically to run at BEP
- Corrosion resistant materials of construction
- Secondary containment options
- Less maintenance & significantly longer MTBM intervals



BREAKDOWN OF PUMP LIFE CYCLE COSTS

Efficiency Minimizes Total Cost of Ownership:

- Efficient designs enable smaller motors to be specified
- > 50% of lifecycle costs are operating costs
- > 30% of lifecycle costs are maintenance costs

Precision Manufacturing:

- Made in the USA, UK, France and Spain
- Short delivery times
- Comprehensive testing – ensures no surprises and limited adjustments once deployed

Performance Tailored to Your Process

When it comes to handling harsh & corrosive chemicals, Sundyne's engineered solutions set the standards for reliability, efficiency and safety – resulting in lower total lifecycle costs and uncompromising performance.

Sundyne is the One-Stop-Shop for Industry Standard Sealless Pumps

The Value that Sealless Pumps Bring to EPI Applications

While pumps utilizing mechanical seals play a key role in many applications, it's no secret that almost 85% of pump failures start with seal leaks that cause problems elsewhere in the pump. When planning a new installation, CAPEX for the seal support system is considerable. After installation, OPEX for seal monitoring & maintenance activities is unavoidable.

Who Should Consider Sealless Pumps?

- Applications with legislative & liability risk compliance
- Units needing to improve reliability
- Duties that are hard to seal
- Applications/fluids that react with moisture/air
- Any plant seeking to meet higher MTBF goals

Sealless pumps eliminate the seal and associated support systems, providing an economical, reliable and leak-free solution for handling toxic or hazardous liquids. The Top 10 Advantages that Magnetic Drive Sealless Pumps offer:

1. No seals & no seal support systems
2. Complete fluid containment
3. Zero product emissions
4. Reduced installation costs
5. Reduced maintenance costs
6. Longer MTBF intervals
7. Maintenance time/skills can be used elsewhere
8. No EPA monitoring/documentation
9. Improved operator safety
10. Protection for the environment

What are the Benefits of Sealless Pumps?

- Significantly cheaper installation costs
- Compact footprint with no alignment issues
- No seal support system and utilities
- Less instrumentation
- Higher MTBF
- Less Maintenance & lower Total Cost of Ownership
- No product leakage
- Zero environmental impact

Adherence to Industry Standards:

Standards play a key role in the chemical industry. The characteristics they define assure customers that performance & safety requirements are met, while also guaranteeing interoperability for equipment throughout a plant.

ANSI – American National Standards Institute
ASME – American Society of Mechanical Engineers
ISO – International Organization for Standardization
API – American Petroleum Institute

API 685 describes the requirements for sealless centrifugal pumps manufactured for the petroleum, petrochemical and gas processing industries. The **ANSI/ASME B73.3** standard addresses centrifugal pumps for the chemical industry. The standard covers 27 pump sizes and specifies dimensions for height, length, nozzle and shaft diameters, plus the location & spacing of mounting bolts. The **ISO 5199/2858** standards cover the same type of industrial pumps as ANSI B73.3.

Sundyne sealless pumps meet and exceed all standards applicable to the petroleum, petrochemical, chemical and general processing industries – anywhere around the globe.

Metallic Options

HMD's engineers have leveraged more than 70 years of experience to ensure that HMD Kontro sealless pumps adhere to, and exceed the latest API, ASME and ISO standards.

Non-Metallic Options

For highly corrosive chemical applications, ANSIMAG pumps are available in high-grade fluoropolymer materials that stand up to abrasive or highly-corrosive applications.

API-Compliant Options

Sundyne provides a comprehensive range of fully compliant API 685 pumps that are specifically engineered to eliminate product emissions and improve personnel safety without compromising on high performance and reliability

Sundyne is the one-stop-shop for sealless pumps for any EPI application.

ESG for the Energy & Petrochemical Industries

ESG (Environmental Social & Corporate Governance) Practices are Vital to Every Industry

Sundyne pumps & compressors are used in sustainable applications that help the environment, such as:

Cleaner Power

- Fuel gas boost
- Amine scrubbing
- CO_2 CCUS
- NOx reduction
- Hydrogen blending

Renewable Fuels

Sundyne Pumps and Compressors move the fluids needed for renewable fuels and biofuels refineries, for e-methanol production plants and for low-carbon sustainable aviation fuel.

Sustainable Agricultural

Optimize the efficiency of:

- Fertilizer production
- Urea production

Hydrogen Mobility

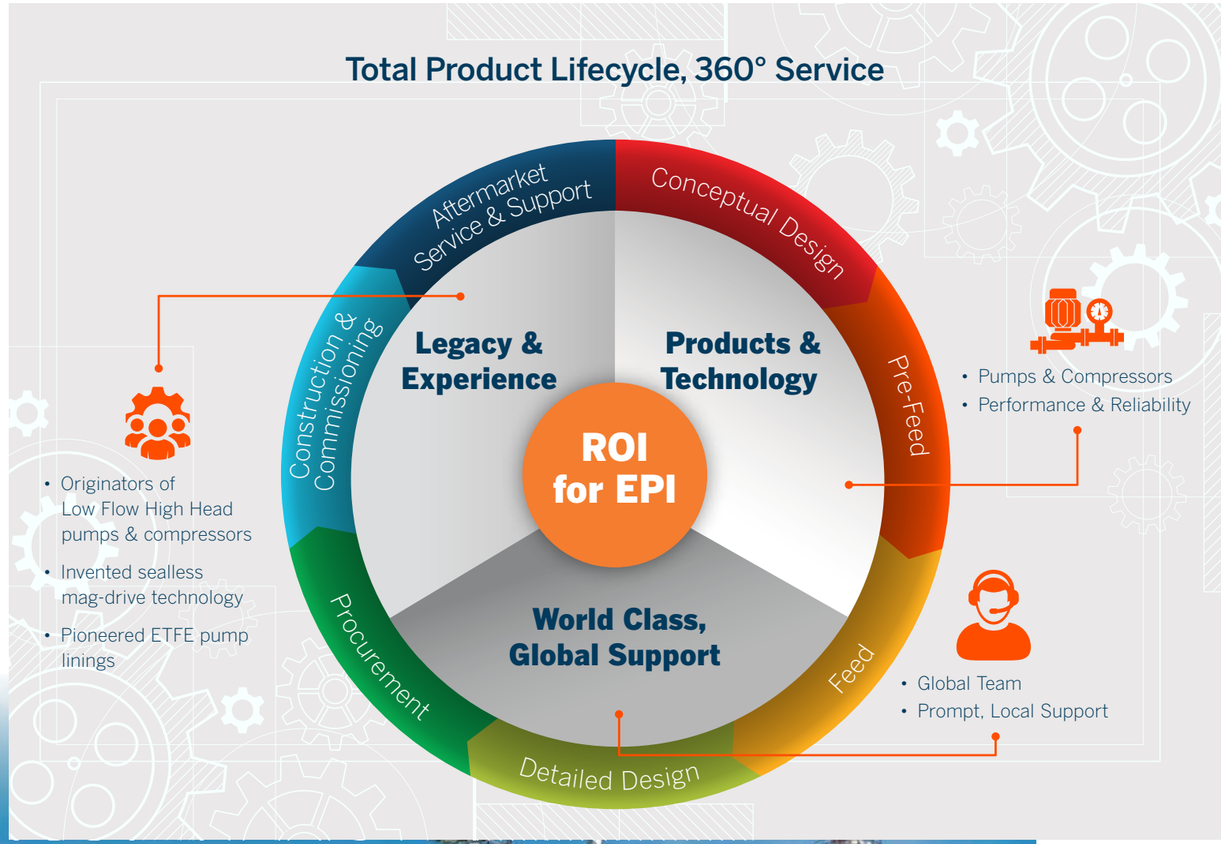
Production, storage, transport & refueling Hydrogen for road, rail, material handling, aviation and maritime vehicles

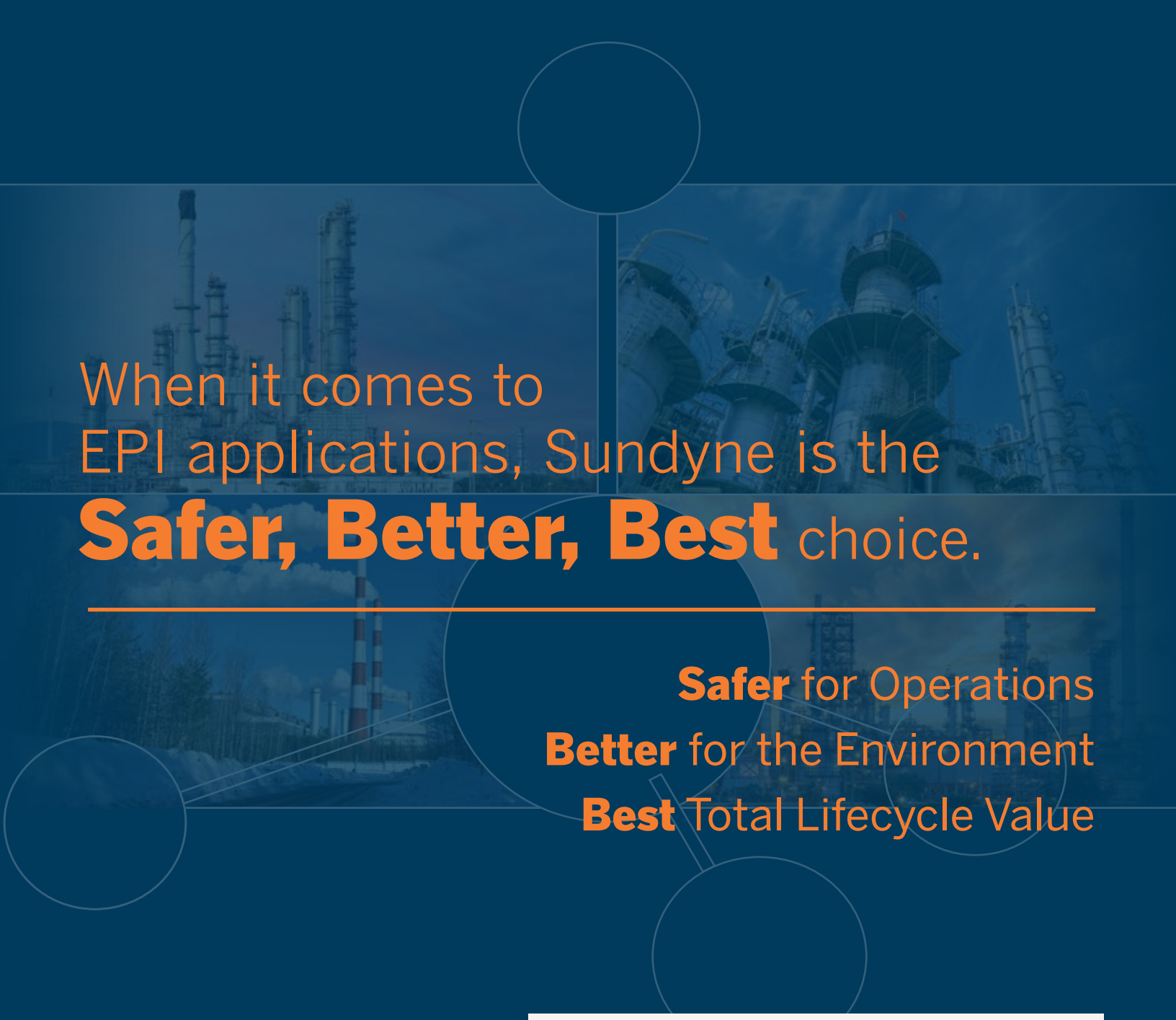
Sundyne's ESG efforts go far beyond these high-profile examples. They're also found in everyday items such as:

- Energy Efficiency
- Chemical Security
- Employee Health & Safety
- Uncompromising Reliability

Sundyne's EPI Value Proposition

For more than 70 years, Sundyne has worked extensively with the world's largest energy & petrochemical companies. During this time, Sundyne has pioneered many of the technologies that are commonplace today. Sundyne's commitment to the EPI is stronger than ever, through a unique combination of technology, support and expertise that provides a **total product lifecycle, 360° service**, from the pre-feed process – to comprehensive 24x7 aftermarket support.





When it comes to EPI applications, Sundyne is the **Safer, Better, Best** choice.

Safer for Operations

Better for the Environment

Best Total Lifecycle Value

For more information please visit www.sundyne.com and fill out the Contact Me form. A Sundyne representative will contact you.

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