



Cement
Chemicals
Defence
Fibre, paper & tissue
Food & beverage
Marine & port operations
Metals
Mining & minerals
Oil & gas
Panelboard
Power generation
Rail
Rubber
Sugar
Water & wastewater

Oil & Gas

Innovative power transmission solutions
for the oil & gas industry



Proven, reliable mechanical power transmission solutions for the oil & gas industry

David Brown Santasalo offers an extensive range of gears and transmissions for all stages of the oil, gas and petrochemical process. Working in partnership with our customers, we understand your operating environment and engineer solutions that are reliable, durable and meet your needs exactly.

We work to always maximise availability and lower the total cost of ownership for you and your customers globally.

Think reliability. Think David Brown Santasalo

- Durable, reliable low maintenance mechanical power transmission solutions
- Maximum gearbox interchangeability for easy drop-in replacements
- All gearboxes conform to the latest ISO, AGMA, DIN and API (high speed) standards, including marine insurance standards (DNV, ABS, GL) where required
- Custom engineered solutions designed to enable OEMs and end users to optimise their package offering
- Global network comprising seven manufacturing facilities and 23 service centres for local oil and gas expertise and customer support

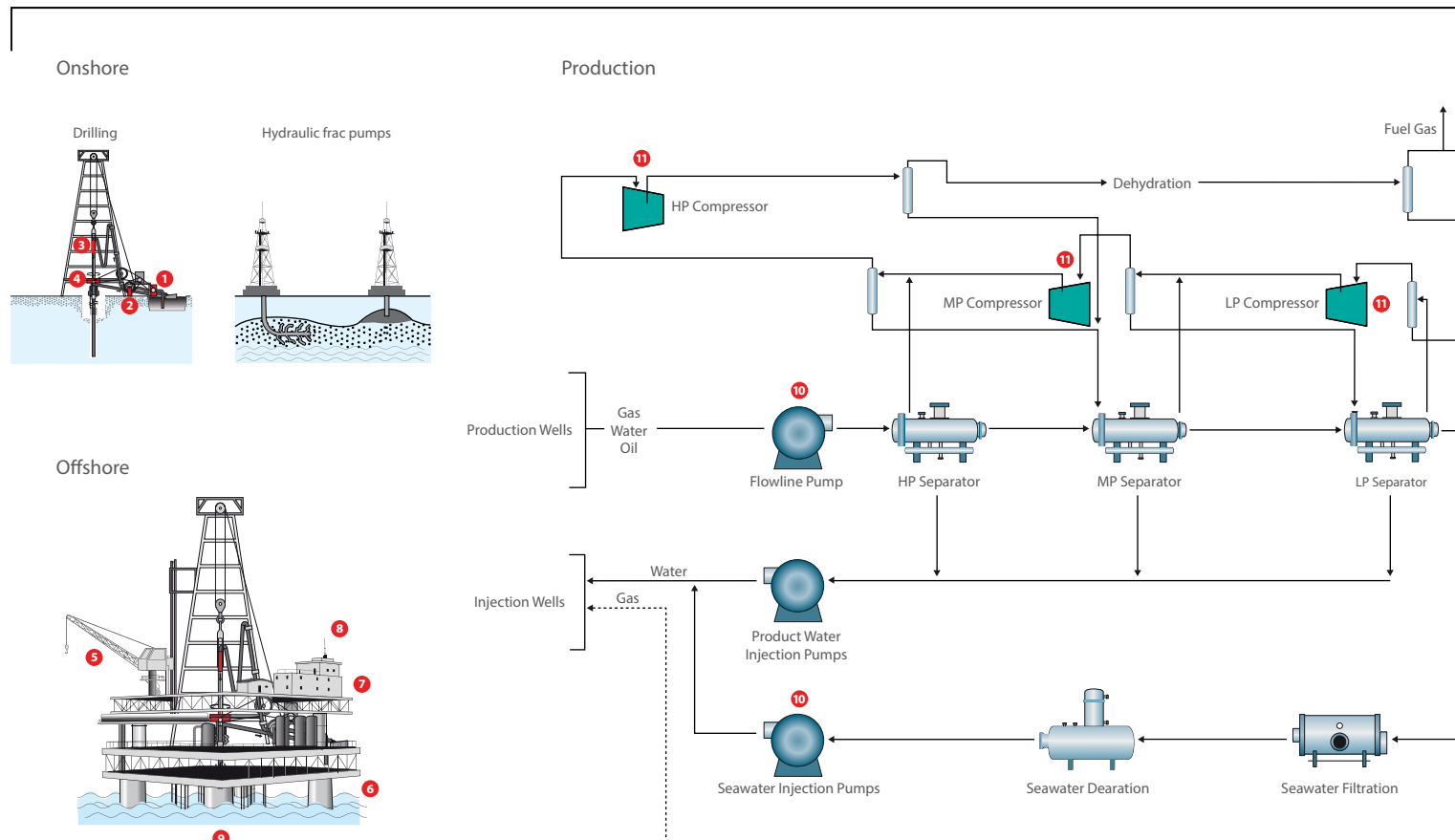


The upstream, midstream and downstream oil and gas process

We understand the demands of the oil and gas process and our experience in supplying gears and transmissions to this market for more than 80 years ensures we are equipped to deal with any challenge, at any stage of the process, anywhere in the world.

- | | |
|--|--------------------------------------|
| 1 Mud/frac pump drives | 7 Anchor winch gears |
| 2 Drawworks gears | 8 Gen-set high speed gears |
| 3 Top drive gears | 9 Right angled fire water pump gears |
| 4 Rotary table gears | 10 High speed pump drive |
| 5 Crane slew and winch gears | 11 Compressor drive |
| 6 Jack up rig gears including jacking pinions and fixation systems | 12 Process pump reducer drive |

Upstream

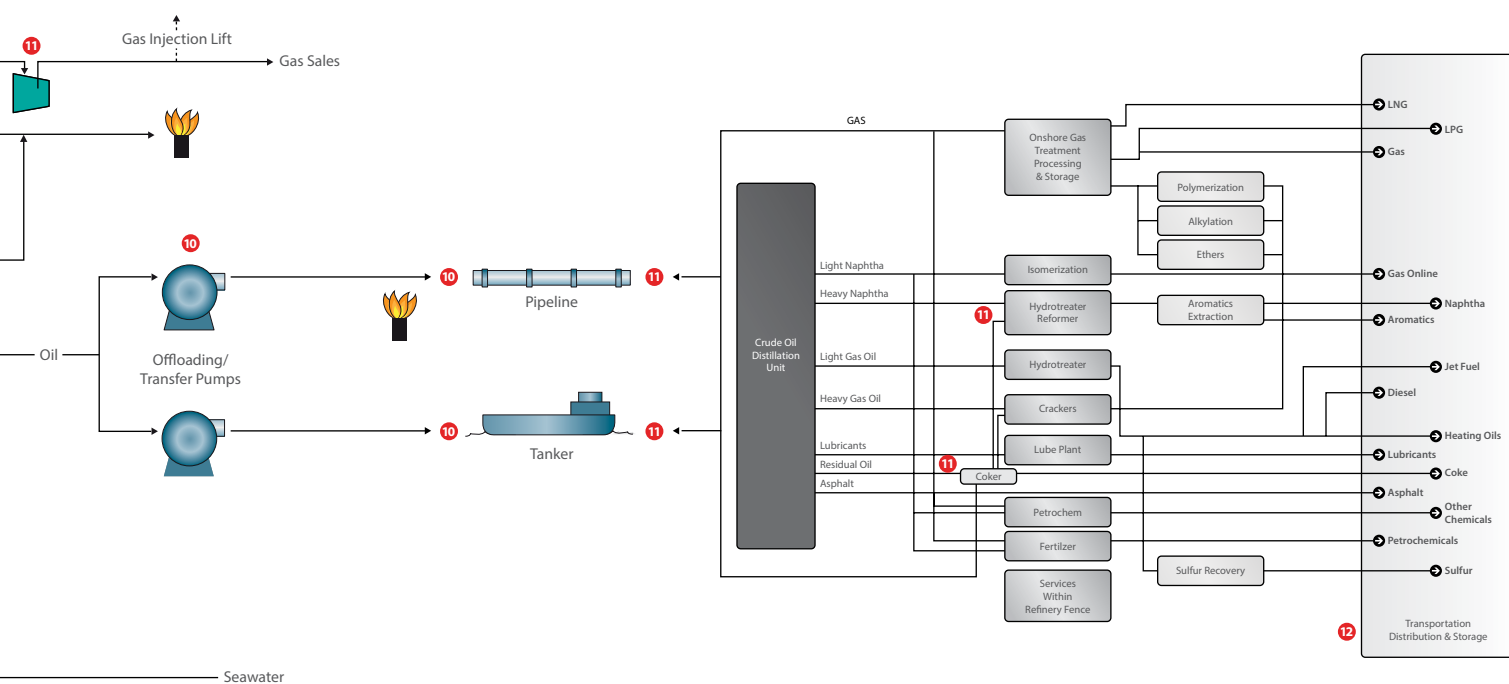


Midstream

Downstream

Transport

Gas processing, refinery, product distribution and storage



Almost three centuries of engineering expertise

David Brown Santasalo has a dedicated global team of design engineers experienced in providing tailored solutions for all applications in the oil and gas industry. Our engineers work with you to provide optimised designs using state of the art software, equipment and processes.



Gear design

- David Brown Santasalo designs to API, AGMA, JIS, DIN or ISO standards
- Tooth modifications to achieve optimal performance
- Designed using the latest software design tools for power transmission solutions

Housings, couplings and shafts

- Designed for thermal efficiency
- Designed using the latest software design tools for FEA analysis and 3D modelling (Solid Edge)

Gear manufacturing across 4 continents

David Brown Santasalo has unrivalled capability to manufacture and assemble gears in North America, Africa, Europe and Asia

- State of the art gear cutting and grinding machine tools
- Gears and gearboxes manufactured to any rating or gear grade
- Manufacture of full gear systems and loose gears to customer specified designs
- High accuracy gears up to AGMA 14 after heat treatment
- In house carburising to 3m and 4.5 length



Assembly and load testing

All gearboxes follow strict quality control guidelines and reviews before being shipped to our customers worldwide. David Brown Santasalo offers no-load spin testing and full scale load testing of standalone gear units or complete drive assemblies depending on your requirements.

Our full load testing capabilities include the measurement of temperature, vibration and noise

Quality control

Every gearbox we make is subject to strict monitoring standards. Components are meticulously inspected for material quality and dimensional accuracy using cutting-edge gear inspection and measurement technology. Key manufacturing processes are performed in-house to ensure consistent quality across all stages of production.

The result

Highly reliable gear units built to meet the intense demands of industrial processes.



The complete oil and gas industry product range

David Brown Santasalo has an extensive range of gearboxes for drilling, jack up rigs, high speed and auxiliary applications. All David Brown Santasalo gearboxes are designed and manufactured to major international standards including API, DNV and ABS to ensure a safe, reliable and durable product in service. Our main priority is to ensure you have maximum availability and productivity at the lowest lifetime cost.



High speed gearboxes

David Brown Santasalo engineers high quality, high speed gearboxes that operate at speeds beyond 40,000rpm. Our new range of high speed gearboxes combine flexible, high performance designs with cost effectiveness.

Pressure pump drives

Oil drilling requires products that are capable of handling the arduous processing environment. David Brown Santasalo's pressure pump drives are designed and built to guarantee reliability in these vital processes.

Firewater pump gearboxes

David Brown Santasalo has a proven history in supplying quality spiral bevel gearing for vertical pump applications and can supply both speed increasers and speed reducers.

Speed reducing gearboxes

David Brown Santasalo can design and manufacture any speed reducing gearbox for applications such as reciprocating pumps, reciprocating compressors and anchor winch drives.



Top drive gears

We offer comprehensive top drive solutions through our global design and manufacturing facilities.

Drawworks gears

David Brown Santasalo engineers drawworks gearboxes to suit customers' specific applications, providing ultimate reliability and maintainability.

Crane slew and winch drives

David Brown Santasalo manufactures two or three stage planetary design crane slew and winch gears to customer specifications.



Jack up rig gearboxes

We design and manufacture multi-stage planetary and multi-stage spur and helical gearing for jack up rigs across the globe.

Jacking pinions

David Brown Santasalo has experience in different module sizes and manufactures jacking pinions to many major international standards such as DNV and ABS.

Fixation systems

David Brown Santasalo has extensive experience in supplying electro-mechanical platform fixation systems utilising a wide range of gearing technology



The HX series

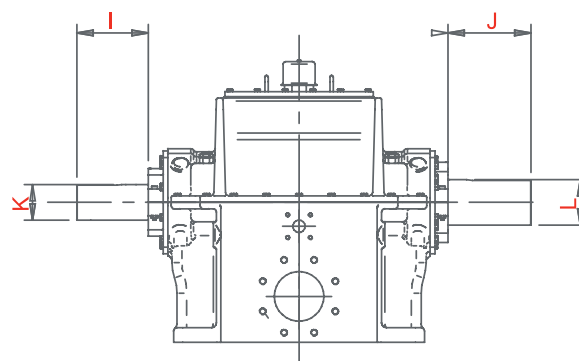
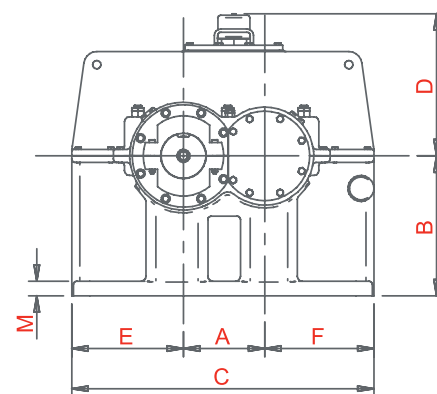
When it comes to specifying high speed gearboxes for critical applications such as pumps, compressors and generators, we use our experience in designing innovative gearboxes for some of the world's most critical applications. Our HX high speed gearbox series combines enhanced performance, adaptability and increased reliability to deliver a standard range that has the flexibility to meet your specific requirements.

Key features

- High speed gear systems for applications up to 60MW
- Customisable product range that's flexible to suit your application and need for rapid delivery and minimal downtime
- Designed and manufactured to all major international standards including API613, API677, AGMA6011, AGMA421.06 and DIN
- Available as a full package solution including lubrication system, barring drive and clutches
- Five year warranty available

Design features

- Double helical gearing as standard, however single helical gearing is available to suit specific requirements
- Designed to limit sound pressure levels to meet low noise emission standards
- Flexible gear case configuration allows for the positioning of oil inlets to minimise pipe runs
- Oil reservoirs and housings that enclose moving lubricated parts are designed to minimise contamination by moisture and dust
- Designed to operate at maximum efficiency and minimum oil quantity, however integrated or standalone lubrication systems can be provided



**FREE FIVE YEAR
WARRANTY AS STANDARD**

Product range includes:

Low ratio gearbox including ratios 1.2 to 4.1 - Optimised ratios beyond 4.1 are available on request

	A	B	C	D	E	F	G	H	I	J	ØK max	ØL max	M	
													Cast	Fabricated
HX200	200	400	810	430	290	320	650	803	165	205	100	125	40	65
HX250	250	430	950	485	340	360	770	923	205	260	125	160	45	65
HX280	280	460	1,030	520	370	380	830	1,003	230	295	140	180	50	65
HX315	315	500	1,135	560	410	410	940	1,098	260	325	160	200	55	65
HX355	355	540	1,245	600	440	450	1,010	1,203	295	365	180	225	55	65
HX400	400	590	1,370	650	490	480	1,140	1,333	325	405	200	250	65	65
HX450	450	640	1,520	720	540	530	1,220	1,468	365	455	225	280	65	84
HX500	500	690	1,650	770	590	560	1,300	1,588	405	510	250	315	70	84
HX560	560	750	1,800	830	640	600	1,450	1,763	455	575	280	355	70	84
HX630	630	820	1,990	900	700	660	1,570	1,938	510	645	315	400	75	92
HX710	710	900	2,180	975	770	700	1,690	2,153	575	725	355	450	80	92

High ratio gearbox including ratios 4.1 to 8.5 - Optimised ratios beyond 8.5 are available on request

	A	B	C	D	E	F	G	H	I	J	ØK max	ØL max	M	
													Cast	Fabricated
HX200	200	400	770	430	310	260	520	623	165	205	100	125	40	60
HX250	250	430	870	485	360	260	560	698	205	260	125	160	45	60
HX280	280	460	930	520	380	270	660	743	230	295	140	180	50	65
HX315	315	500	1,045	560	430	300	750	808	260	325	160	200	55	65
HX355	355	540	1,125	600	470	300	800	863	295	365	180	225	55	65
HX400	400	590	1,230	650	510	320	900	923	325	405	200	250	65	65
HX450	450	640	1,370	720	570	350	950	1,023	365	455	225	280	65	65
HX500	500	690	1,480	770	620	360	1,010	1,113	405	510	250	315	70	70
HX560	560	750	1,620	830	670	390	1,130	1,208	455	575	280	355	70	70
HX630	630	820	1,790	900	740	420	1,190	1,308	510	645	315	400	75	75
HX710	710	900	1,970	975	820	440	1,280	1,433	575	725	355	450	80	80

HX800 and HX900 available in a fabricated case design

Top drives and drawworks

David Brown Santasalo provides a comprehensive range of gearing products and solutions for capital drilling equipment such as top drives and drawworks. Working to our customers' designs, we can produce high quality gearing at any of our 6 manufacturing facilities worldwide

David Brown Santasalo can also offer a comprehensive turnkey solution for gearbox supply utilising our global supply chain and fully equipped assembly and test facilities. We form collaborative relationships with our customers and add value through our core engineering knowledge.

Key features

- Supply of single components through to fully tested gear units
- We optimise gear and gearbox design to our customers' specifications using our global manufacturing capabilities
- Expertise in uprating and redesign
- All gear systems are designed and manufactured to major international standards for ultimate performance and reliability

Design features

- Spur, helical and planetary gearing
- Typical sizes range from 1/2"Ø to 288 P.D, although larger dimensions can be accommodated
- Wide range of gearing technologies available





Pressure pump drives

David Brown Santasalo delivers tailored loose gearing and full pressure pump drive gear systems to OEMs and end users across the globe. Almost three centuries of combined gearing innovation in assurance critical industries enables us to design and manufacture any type of loose gear at any size, as well as complete gearbox systems for:

- Hydraulic fracturing
- Cementing
- Acidizing
- Mud pumping

Key features

- Loose gearing manufactured to any size
- Gears are lightweight, compact and strong to support HP increase
- Flexible gearbox mountings aligned with our customers’ specific pump arrangement
- All pressure pump gears are designed to the latest international standards for complete quality assurance

Available gear designs

- Herringbone arrangements for main crank gears
- One or two speed reducers between the diesel prime mover
- Multi-stage reducers to truck power take off unit
- Planetary or spur main drives available
- Two speed parallel shaft intermediate step down gearboxes
- Side mounted, end mounted and internal gearing arrangements depending on pump specifications

Typical capabilities

Type	Sizes		
From 1/2"Ø, 48 D.P. to maximum sized listed:	Face	Size	Pitch
Spur gears	48"	288" P.D.	0.5 D.P
Helical gears	48"	288" P.D.	0.5 D.P.
Internal gears	30"	228" P.D.	0.63 D.P.
Bevel gears	8"	36"	7/8 D.P.
Gear racks (spur or helical)	10"	10' - 12'	1 1/2 D.P
Spline shafts	All sizes and pitches depending on design		
Sprockets	18"	60" P.D.	3" Pitch
Double helical gears	17"	288" P.D.	0.5 D.P.
Ground gears (with or without crowning)	63"	72" P.D.	3/4 D.P
Gear inspection	80"	80"	All

The above shows our typical capabilities. if your required size is above the dimensions listed above, please contact your local David Brown Santasalo office.

Jack up rig gearboxes, pinions and fixation systems

David Brown Santasalo jack up rigs gears are designed for use in jack-up rigs, self-propelled offshore lift boats and any other offshore vessels where leg elevation is required to provide a stable platform to address the needs of offshore workers. Successful operation of these vessels is highly dependent on an effective jacking and fixation system. Often working in difficult conditions, David Brown Santasalo gearboxes deliver intense torque and optimum performance even in severe storms.

Jack up gears – key features

- Jack up rig gears for all major rig designs including Le Tourneau, Gusto and Keppel FELS arrangements
- Typical ratios from 7000 – 9000 rpm
- Output speeds from 0.1m – 0.3m/min
- Typical rated jacking capacities from 80 – 500 tons
- Typical rated preload capacities from 80 – 600 tons
- Typical rated normal holding capacities from 150 – 800 tons
- ABS/DNV compliance

Jack up pinions – key features

- A range of module sizes available from 50 – 105 MOD
- Heat treatment enables conformation to AGMA 14
- Fully compliant to ABS and DNV international standards for complete assurance



Fixation systems – key features

- Complete range of helical and planetary gearing technology to match each application
- High overload capacity and low backlash
- Compact and lightweight designs enable higher torque production within the same space envelope



Other gear systems for oil & gas industry applications

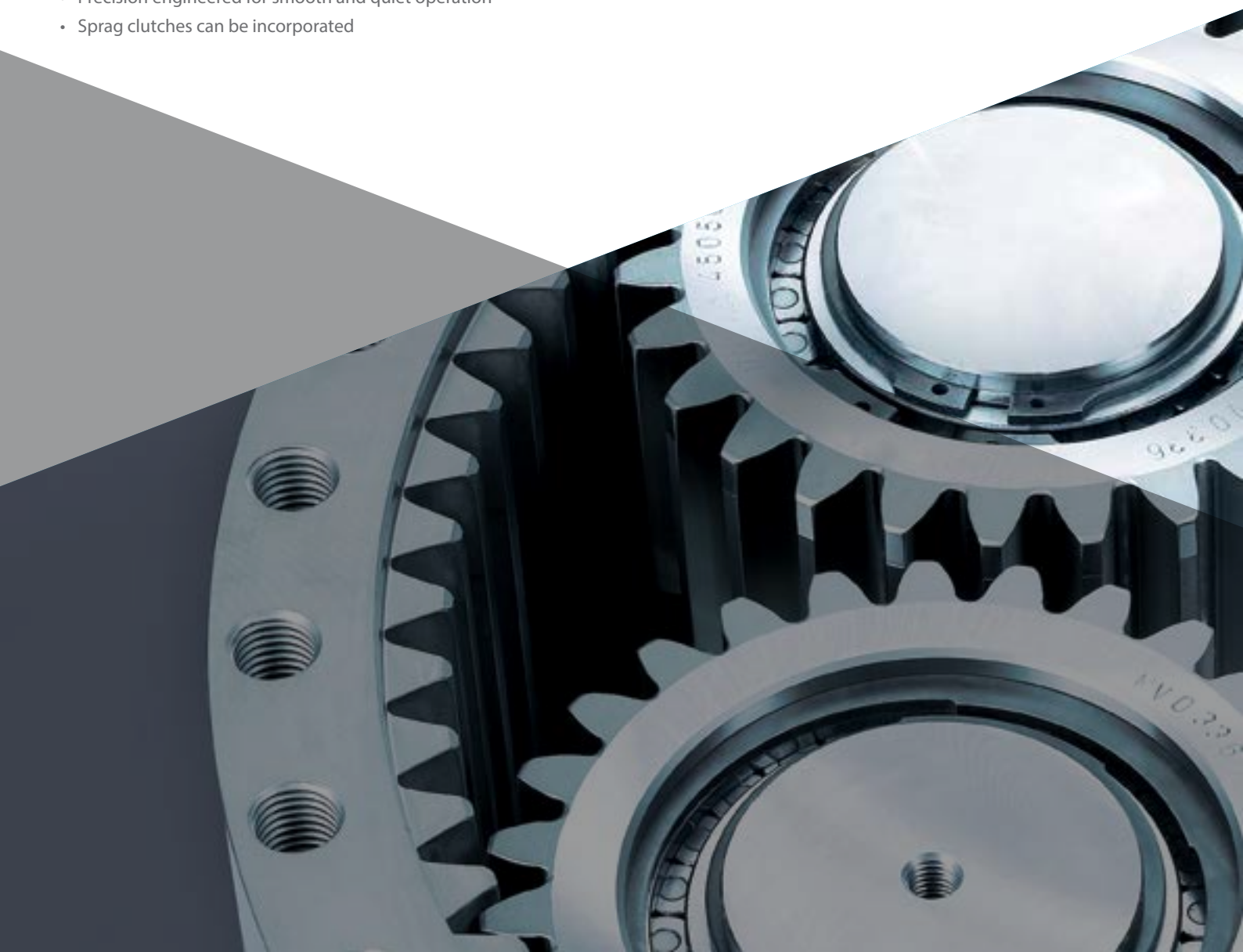
David Brown Santasalo offers a range of auxiliary products for the oil and gas industry which are tailored to suit our customers' exact requirements. Using our proven track record of meeting the demands of the oil and gas industry, we design auxiliary gearboxes to be flexible, reliable and cost effective.

Firewater pump gearboxes

David Brown Santasalo has vast experience in supplying quality spiral bevel gearing for offshore vertical pump applications from mine hoists and associated equipment in many types and sizes, to full gearing drives. We understand the demands of the upstream oil and gas processes and our firewater pump gearboxes are designed to be flexible, reliable and cost effective.

Key features

- Spiral bevel gearing
- Proven design capability up to 6MW
- Rolling element bearings
- Thrust bearings designed to carry pump loads
- Hollow shaft design available
- Precision engineered for smooth and quiet operation
- Sprag clutches can be incorporated



Crane slew and winch drives

David Brown Santasalo's two or three stage planetary design crane slew and winch gears are designed to guarantee reliability within our customer's exact specifications. We provide an adaptable range of slew and winch gears that are capable of handling even the most demanding offshore environments.

Key features

- Planetary gearing design
- Single or double helical gearing can be incorporated
- Optimised performance using proven engineering expertise



Geared for service

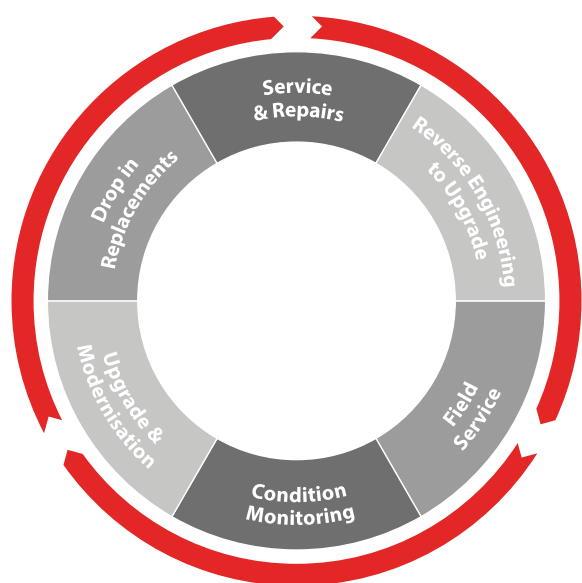
We understand that fast response is key to anyone who needs gearbox service and repair in the oil and gas industry. Our global network of manufacturing and service facilities spanning 6 continents ensures we can provide support to you and your customers wherever you are, whenever you need us.

With almost three centuries of gear unit design and manufacturing expertise, we understand how to maintain and service even the most difficult, mission critical gear units to ensure optimal results and long gear unit life – regardless of the brand.

As a full service solution provider, we not only provide support for all David Brown Santasalo gearboxes, we can also service and repair other manufacturers’ units and our heritage brands.

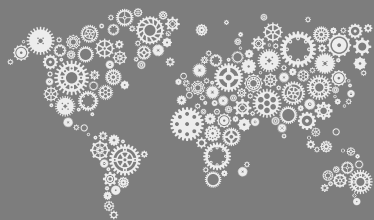


Main Factories China Finland	Manufacturing & Service Australia Canada India South Africa	Service Centres Australia Canada Chile China Finland Indonesia Sweden UK USA	Sales offices Finland France Malaysia Peru
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**David Brown Santasalo
understands how to service
mission-critical gear units
to ensure optimal results
and long gear unit life**





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GearWatch Condition
Monitoring:

