

NASH

DRY VACUUM PUMPS & SYSTEMS - EMEAIA CATALOG



**CHOOSE THE RELIABLE
VACUUM SOLUTION & ENJOY
UNINTERRUPTED OPERATION**

Thanks to Nash engineers' expertise and robust design, the Nash dry screw vacuum pumps & systems continue to deliver uninterrupted performance even in the harshest chemical processes and save you from costly downtime.

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TURN TO THE TRUSTED MARKET LEADER!



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NASH COMPANY INTRODUCTION

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Our vacuum and compressor systems have operated reliably for decades in the oil and gas industry, in refineries, in the chemical process industry, in the pharmaceutical industry, in the general process industries, in filter applications, in pulp and paper production, in electric power generation, in wastewater treatment and in many other applications.



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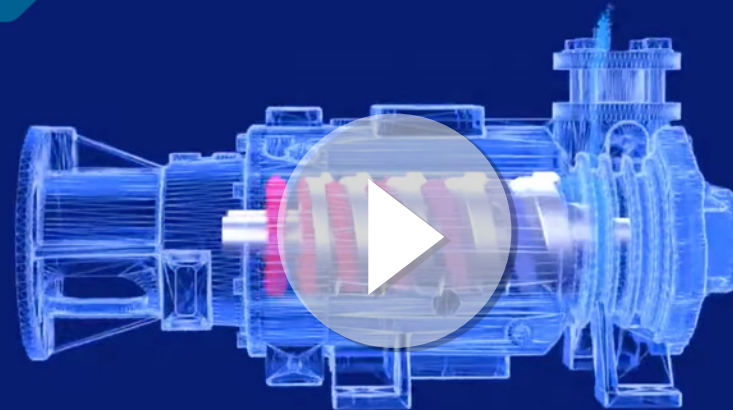
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Dry Screw Technology

Dry vacuum pump technology – especially variable pitch screw chemical dry pumps – offer clear, measurable advantages in a wide variety of essential applications. A properly designed dry screw vacuum pump ensures the processing needs are accomplished with a safe, reliable, and cost-effective solution.

CHECK HOW
IT WORKS



WATCH
THE VIDEO!



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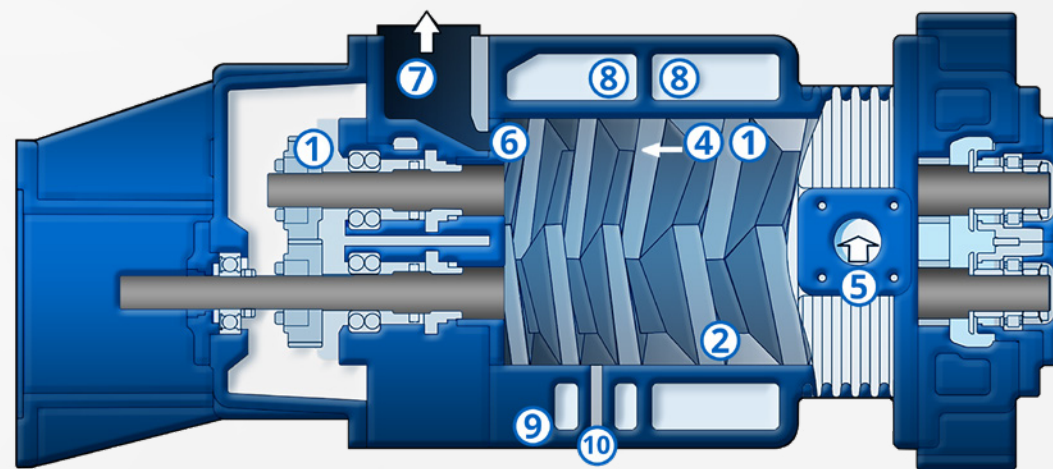
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How do Dry Screw Vacuum

Pumps work:

- A dry screw vacuum pump consists of two parallel, non-contacting helical screw-shaped rotors **(1)** and **(2)**, Fig. 1, rotating synchronously at high speeds via precision gears **(3)**. They rotate in opposite directions, and in so doing, trap a quantity of gas at the inlet **(5)** and transport it towards the exhaust port **(6)** and into the exhaust channel **(7)**. The walls of the stator **(9)** and the special shape of the intermeshing screws form the compression chambers or pockets **(4)** that transport the gas.
- Small clearances between the screws and the stator, as well as small clearances between the intermeshing screws, ensure that the amount of reverse leakage towards the inlet is small in comparison to the forward flow of gas generated by the screw pockets.
- Reverse flow of the pumped gases is prevented by the length of the sealing boundary, (i.e., the number of spirals and tight clearances). On pumps fitted with a compression plate a slight reverse expansion of gas into the screws occurs when the outlet valve or port is first exposed. This is quickly expelled as the trapped volume is progressively reduced to zero by the action of the screws.
- The reverse flow of gas is primarily controlled by the width of the “sealing lands” on the tips of the screw profile. These wide lands run in close proximity with the stator and minimize the reverse leakage of gas. Ultimate pressures in screw pumps can be less than 0.01 torr (0.01 mBar).
- In variable pitch models, the gas is compressed as the pitch changes to give additional compression before the pump exhaust. This spreads the heat load more evenly across the length of the rotors. In single pitch models, more compression is achieved in the last half-turn against a compression plate or valve, biasing the heat generation towards the exhaust. In dry pumps, temperatures have to be high enough to avoid condensation throughout and low enough to avoid auto-ignition and polymerization. Progressively higher gas temperature towards the exhaust in variable pitch pumps assists greatly in preventing condensation of pumped vapors. Variable pitch screw pumps also use power more efficiently than single pitch ones.
- Cooling is achieved via the surrounding jacket **(8)**. Pumps can be configured for direct or indirect closed-loop cooling. There are many advantages with the latter, as it means the plant’s cooling water is never in direct contact with the pump material and the jacket cannot silt up or corrode due to poor cooling water quality.
- A gas ballast port **(10)** is available. If required, a gas ballast can help to warm-up a cold pump or dry a wet pump faster, take a flammable vapor out of its flammable range and help to clean solids out of a pump, particularly during solvent flushing.





Applications

Nash dry vacuum pumps & systems are the equipment of choice for many market leading companies that operate across a great variety of industries. Look at the list below and learn about some of the common industries in which the Nash dry vacuum pumps & systems are used!

**Your market is not on the list? You're not sure what vacuum solution you should choose?
Request a quote today - we'll help you choose the perfect-fitting vacuum system for your processing needs!**

Primary markets served:

Chemical Industry	Pharmaceutical Industry	Oil & Gas	Oleochemical	Petrochemical
DRY-PRO® Standard Dry Vacuum Systems	DRY-PRO® Standard Dry Vacuum Systems	DRY-PRO® Standard Dry Vacuum Systems	DRY-PRO® Standard Dry Vacuum Systems	DRY-PRO® Standard Dry Vacuum Systems
CTO	CTO	CTO		
ETO	ETO	ETO		



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The Key Features of Nash Dry Vacuum Pumps & Systems

Nash dry vacuum pumps & systems are flexible and robust vacuum solutions that offer a number of benefits for your company.



• Reliability

- Unrivalled applications engineering know-how.
- High liquid and vapor tolerances.
- Contact-free mechanism. No internal valves.
- Indirectly & directly-cooled options.
- Shaft seal purge and mechanical seal standard.
- High back pressure capability (up to 0.3 barG).
- No corrosion by operating in the vapour phase.

• Environmentally Friendly

- No steam, oil, water, seal liquid etc. in the pumping chamber.
- No interstage condensers.
- No effluent generation.
- Immediate solvent recovery at the exhaust by condensation.
- Low vibration & noise levels.

• Safety

- Pumps flammable gases safely.
- Explosion-tested by independent authorities.
- Flame arresters for ATEX Cat 1 & optional for Cat 2.
- Low rotational speed, noise and vibrations.

• Economical operation

- High volumetric efficiency—in terms of m^3h^{-1}/kW .
- Standard modules available for the simplest to the most complex packages for easier installation and use.
- Compact—minimizes installation costs.
- Can be used on multiple processes.

• Low Maintenance & Cost of Ownership

- Can flush with solvents, oil, water or steam.
- No condensation=no corrosion and no polymerization.
- Easy to service and long service life.
- Easy overhaul and minimum parts replacement.
- Simple design—variable pitch screws.

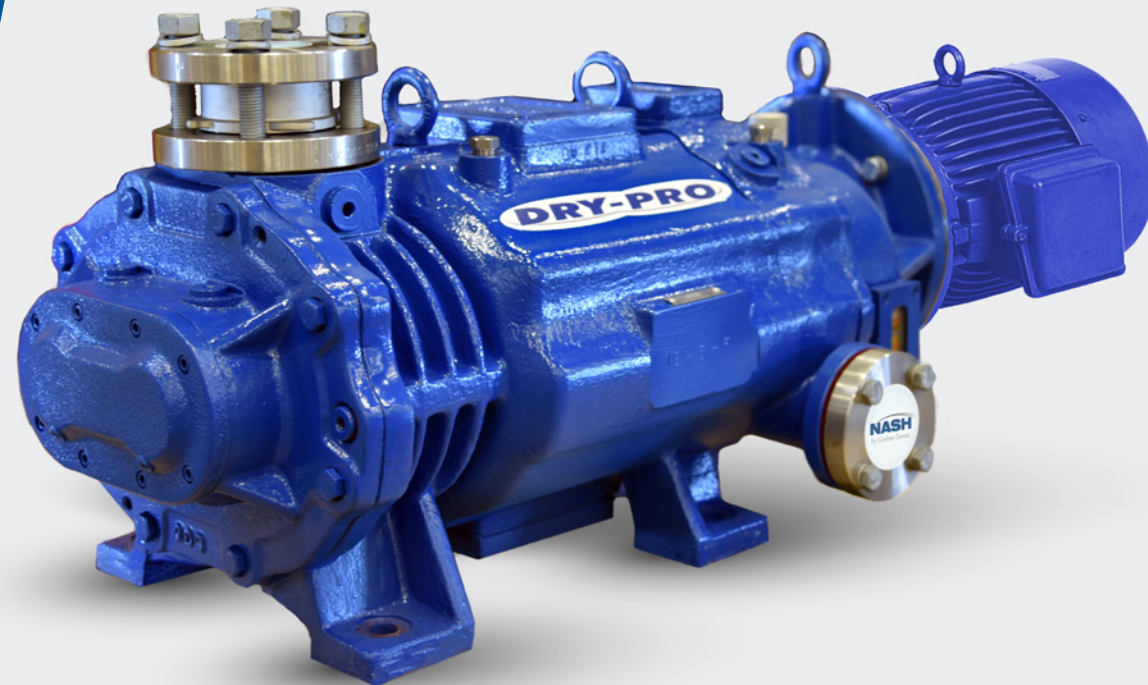
DRY-PRO®

VACUUM PUMPS

The NASH DRY-PRO® is a remarkably simple, reliable and highly efficient dry vacuum pump. The dry and contact-free operation requires no lubrication in the pumping chamber. This translates into major advantages: no process contamination and no pollution caused by the pump. Because of its oil-free, non-contacting screw design, NASH DRY-PRO pumps can safely and reliably handle corrosives, condensibles and flammables, including acids, organics, inorganics and solvents.

Features:

- Ultimate vacuum to 0.02 Torr (0.03 mbar)
- Variable pitch screw rotors power optimize efficiency and temperature distribution
- Operates at any pressure between blank off and atmospheric pressure
- Higher capacities with mechanical boosters
- Optional internal coatings available
- High vacuum in one stage & high water vapor tolerance
- Low rotation speed ensures smooth and robust operation
- High back pressure capability means more robust operation



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DRY-PRO® VACUUM PUMPS

*Higher capacities available
 **Ask us about the certification details

VSB 120 - 180 CHEMICAL DRY PUMPS	UNITS	VSB 120		VSB 200		VSB 320		VSB 430		VSB 800	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Capacity	m ³ h ⁻¹	86	97	130	143	226	246	306	382	525	637
	acfm	51	57	77	84	133	145	180	225	309	375
Ultimate (blank-off) vacuum	mbar	0.13	0.07	0.07	0.03	0.04	0.03	0.04	0.03	0.04	0.01
	Torr	0.1	0.05	0.05	0.02	0.03	0.02	0.03	0.02	0.03	0.01
Maximum back pressure - standard	barg	0.3									
	psig	4.2									
Power consumption at 10 mbar, (7.5 Torr)	kW	2.2	2.5	2.8	3.1	4.7	5.2	6.4	7	10.9	12.9
	hp	2.9	3.3	3.8	4.2	6.2	6.9	8.5	9.4	14.5	17.2
Standard motor (400 - 690V +10%, 3ph, 50Hz)	kW	3		5.5		7.5		11		15	
Standard motor (200 - 490V +10%, 3ph, 60Hz)	hp	5		7.7		10		15		20	
Minimum cooling water flow rate, (adjustable)	lph	120	180	240	265	480	530	660	730	1200	1320
	US gpm	0.5	0.8	1.1	1.2	2.1	2.3	2.9	3.2	5.3	5.8
Cooling water supply temperature.**	°C	5 - 35*		5 - 35**		5 - 35**		5 - 35*		5 - 35*	
	°F	40 - 95*		40 - 95**		40 - 95**		40 - 95*		40 - 95*	
Cooling water supply pressure range.	barg	1 - 10									
	psig	15 - 145									
Shaft seal purge flow, drive end, (normal)	lph	200	200	200	200	300	350	300	350	450	500
	ft ³	7	7	7	7	10.6	12.5	10.5	12.5	16	17.5
Shaft seal purge supply pressure range	barg	2 - 10									
	psig	29 - 145									
Seal purge regulated pressure, (normal/maximum)	barg	0.2 / 0.6									
	psig	3 / 9									
Noise (maximum with exhaust silencer)	dB(A)	72	72	73	75	74	85	76	85	78	85
Weight (bareshaft pump)	kg	150		220		300		400		600	
	lbs	330		484		660		880		1320	
Oil quantity	litres	0.5		1		1.8		2		2.2	
	US quarts	0.5		1.1		1.9		2.1		2.3	
Grease quantity	ml	22		22		24		24		42	
	US fluid oz	0.74		0.74		0.81		0.81		1.42	
Process connection, inlet	ANSI/DIN	1.5"/DN40	1.5"/DN40	1.5"/DN40	1.5"/DN40	2"/DN50	2"/DN50	2.5"/DN65	3"/DN80	4"/DN100	4"/DN100
Process connection, outlet	ANSI/DIN	1.5"/DN40	1.5"/DN40	1.5"/DN40	1.5"/DN40	1.5"/DN40	1.5"/DN40	2"/DN50	2.5"/DN65	2.5"/DN65	3"/DN80

*Higher capacities available



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VACUUM BOOSTERS

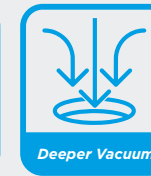
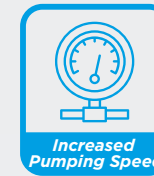
Vacuum boosters are positive displacement, two-lobe rotary blowers. Very tight running clearances enable the boosters to operate efficiently without the need for lubrication in the process chamber.

The lobes, which are synchronized by timing gears in the oil box, convey the gas from the inlet to the discharge along the inner wall of the casing. The gas flow path is very short, which reduces the potential for condensation and material buildup.

Vacuum boosters, together with their backing dry vacuum pumps, are the key components of dry vacuum systems.

Other Features:

- Easy maintenance
- Small footprint
- Multistage combinations with wet or dry backing pumps
- Reliable and proven over decades
- Low capital and operating costs
- Similar to dry backing pumps



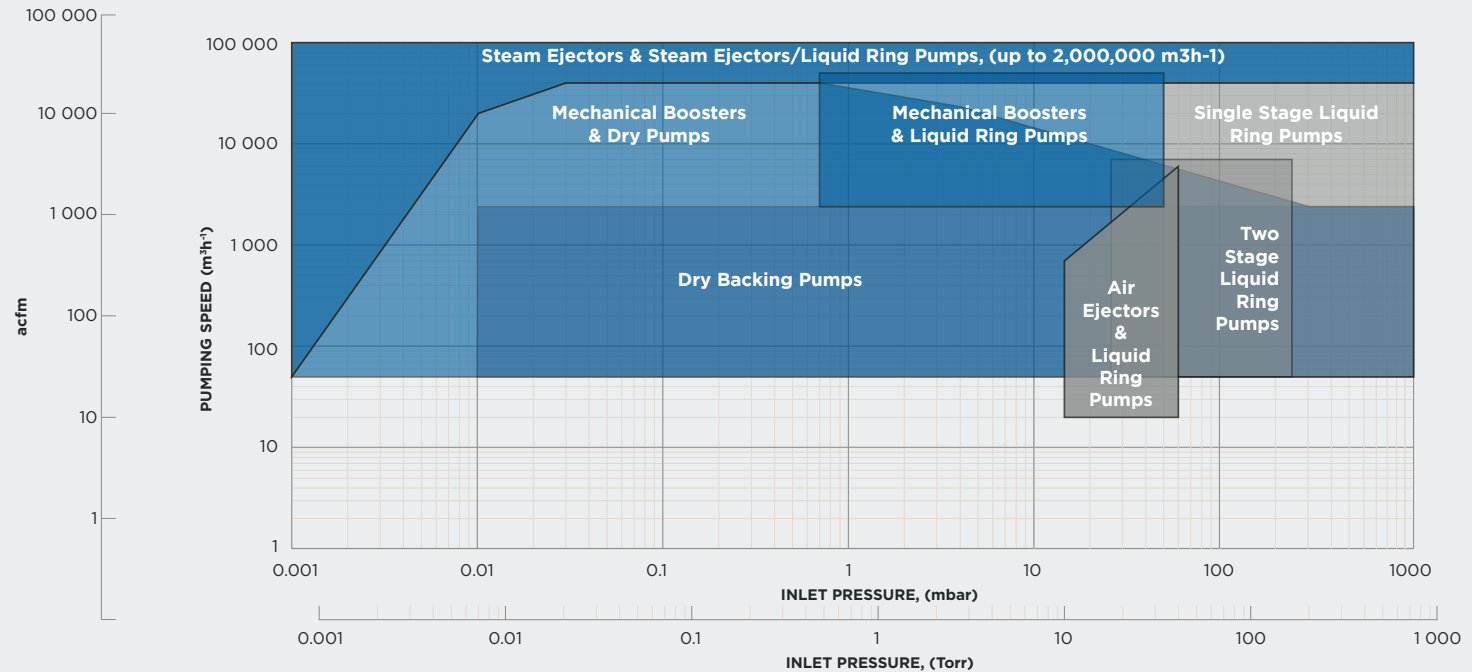
Nash engineered system with vacuum booster

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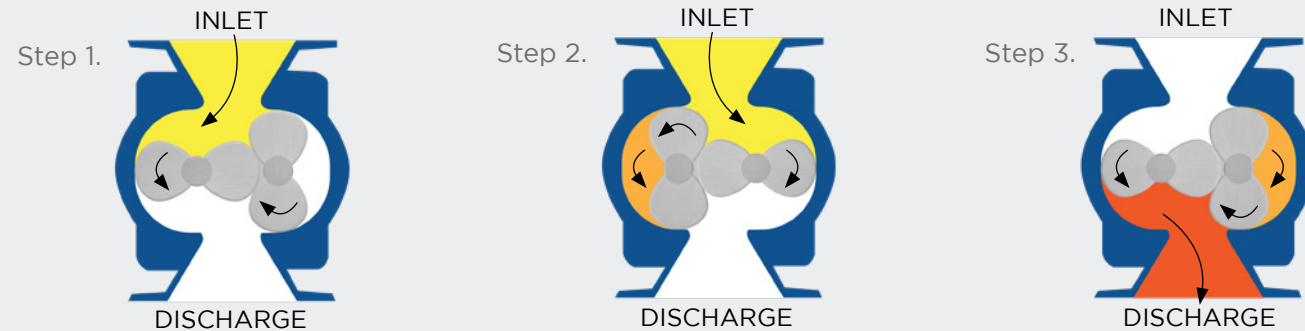
PROCESS VACUUM TECHNOLOGIES

PERFORMANCE RANGE

Vacuum Technology Performance Range:



Vacuum booster operating principle:



Dry Vacuum Systems

LEARN MORE

Nash leverages the vast experience of its engineers who have been designing safe and reliable process vacuum systems for decades. Their accumulated knowledge has resulted in the design of well-engineered systems for optimum performances and avoids common pitfalls. This design philosophy is used by Nash globally, which means you receive a consistent, reliable solution across all regions. Nash dry vacuum systems are designed and constructed to deliver the best possible results for your application.



STANDARD DRY VACUUM SYSTEMS

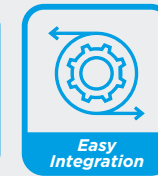
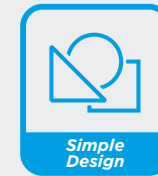
Nash offers a range of standard, pre-engineered dry vacuum system modules for the most common applications. Standard systems are an efficient solution that can be quickly & easily installed for many basic processes.

Standard modules include:

- DRY-PRO® dry screw vacuum pump
- Motor and coupling • Automatic inlet isolation valve
- Vibration monitoring of bearings
- Shaft seal purges • Inlet and interstage purges
- Base frame • Cooling options • Solvent flush kit
- Discharge temperature and pressure sensors
- Mechanical boosters • Flame arresters
- Junction boxes • Atex compliance

Other Standard Options:

- Coating options • Automatic inlet control valve
- Discharge silencer, (cleanable & drainable)
- Inlet and outlet knock-out pots, (KOPs), dust filters, condensers and receivers • Gas ballast
- Inverters • Control panel with process control
- Skids



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CONFIGURED-TO-ORDER (CTO) SYSTEMS

Configured-To-Order (CTO) / Modular Dry Vacuum Systems are the perfect choice for businesses that require dry vacuum systems for more specific applications. The CTO systems feature a modular design which allows for easy modifications for most processes in accordance to your specific needs.

Features:

- Ideal for lightly specified systems that do not carry requirements for all system components
- Allows for modification of process-specific equipment, such as heat exchangers or instruments
- Allows specifications for specific components, such as motors
- Medium delivery timeline

Other Modules & Options (Not Shown)

11. Advanced cooling system
12. Secondary cooling system
13. Gas ballast
14. Inlet mesh
15. Temperature and pressure transmitters
16. Controls
17. Dust filters
18. Exhaust silencer



1. Dry Pump
2. Mechanical booster
3. Isolation valves
4. Flame arresters
5. N2 shaft seal & inlet purge panel
6. Solvent flush kit
7. Modular skid
8. Inlet knock-out pot
9. Receivers
10. Exhaust condenser

READ MORE

ETO (ENGINEERED-TO-ORDER) SYSTEMS

ETO systems are entirely designed and built from scratch to perfectly fit your process needs, regardless of the applications. The Nash ETO systems provide superior efficiency and reliability and are one of a kind pieces of engineering made specifically for you.

Features:

- Completely customized, one-of-a-kind systems
- Engineered & designed to meet your specific process requirements
- All custom equipment and drawings



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Service & Support

Local Support Backed by Global Expertise

Nash offers a comprehensive range of service and support products that are designed to help keep your operations running smoothly and efficiently, avoiding potential equipment failure and costly downtime.

Our **ISO 9001:2008** and **ISO 45001:2018** are strategically located around the world, providing our customers with a range of service and support for your vacuum pump, compressor, or blower system, including:

- Inspections & Repair
- OEM Spare Parts
- Service & Repair Kits
- Conversions and Upgrades
- Materials & Seals
- Coatings & Linings
- ATEX Repairs
- Factory Performance Testing
- Field Service
- Installation & Start-Up Services
- Maintenance
- On-site Capacity & Performance Testing
- Fiberscope Inspections
- Pump Cleaning
- Vacuum Audits

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Each service center is staffed by CERTIFIED, factory trained professionals who have access to a range of state-of-the-art, specialty equipment, tools, and fixtures that are required to rebuild and overhaul a range of pumps, compressors, blowers, screw vacuum pumps and engineered systems. Nash's technical service team is also on hand to provide engineering support as required.

Our team of experts relies on the latest engineering drawings and specifications, as well as a complete inventory of high quality OEM parts and spares. This ensures that your equipment is guaranteed to work within the same performance and reliability tolerances as a new pump or compressor.



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