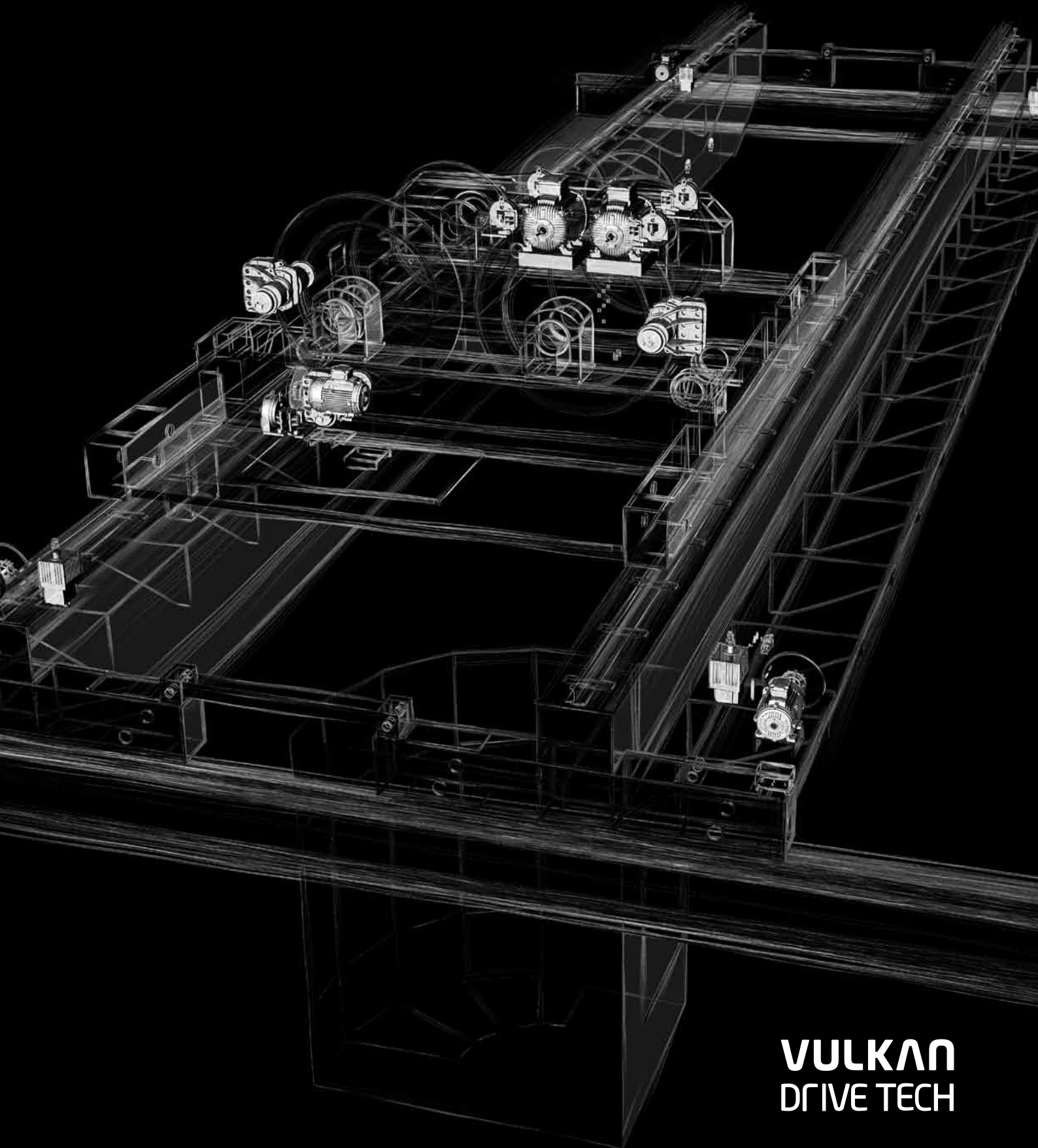


DRIVE SOLUTIONS FOR E.O.T. CRANES



VULKAN
DRIVE TECH

VULKAN DRIVE TECH IS A DIVISION OF THE VULKAN GROUP WITH OVER 120 YEARS OF EXPERIENCE IN DESIGNING AND MANUFACTURING OF COUPLINGS, MOUNTS AND HIGH-POWER BRAKES FOR DEMANDING INDUSTRIAL DRIVES.

TORQUE FOR HEAVY DUTIES – WORLDWIDE

Operating with five international production locations, with 14 subsidiary companies and over 30 agencies worldwide, we ensure that VULKAN Drive Tech expertise is available on-site throughout the world. This means that our customers have rapid access to our specialists and that the necessary solutions are quickly available exactly where they are needed.



Headquarters



Production Subsidiary



Subsidiary



INDUSTRIAL APPLICATIONS

VULKAN Drive Tech provides a range of solutions for either power transmissions or industrial braking systems. In doing so, engineering and technology know-how is applied into 20 different types of applications within six different industrial markets segments.



→ **OIL & GAS** – Onshore & offshore plants involve the large-scale use of compressors, blowers, pumps and fans within the processing chain of fluids and gasses. Our torsional flexible couplings and brakes will preserve the best functionality of diesel engines, electric motors and turbines in the vast majority of working profiles and environments.



→ **MINING** – Stackers, reclaimers, regenerative conveyors belt, mills and crushers are just a few examples of the heavy duty machinery that requires specific high speed & low speed couplings, service & emergency braking systems, backstops and resilient mounts. Our approach to such demanding applications is to deliver engineered tailor-made solutions.



→ **BULK MATERIAL HANDLING** – Gear couplings, electromagnetic service brakes, hydraulic emergency brakes, hydraulic rail clamps for E.O.T. gantry cranes, torsional highly flexible couplings and resilient mounts for construction machinery underline the wide product portfolio and engineering capacity of VULKAN Drive Tech.



→ **ENERGY** – Power generation by means of wind turbines, hydro turbines and steam turbines, requires drive solutions that are capable of withstanding high dynamic torque load and high speed. VULKAN Drive Tech responds to such requirements with high-quality hydraulic brakes, composite materials and integrated electronic power controls.



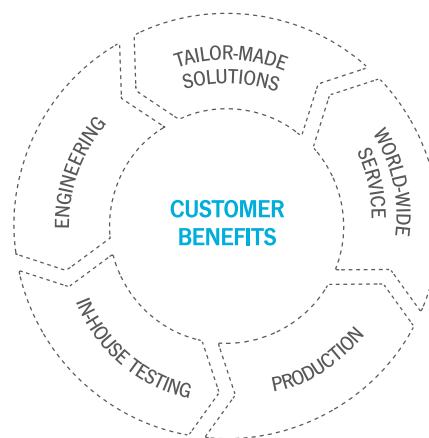
→ **IRON & STEEL** – Continuous ingot castings and hot & cold laminating machinery are typical examples of steelwork equipment where the drives are subjected to dust, dirt and high temperatures. Operational safety and reliability of the drive components and minimum service downtime are the main requirements that our pneumatic disc brakes, maintenance-free flexible couplings and disc couplings must fulfill.



→ **SPECIAL APPLICATIONS** – The unique skills and knowhow developed during more than 120 years of experience makes VULKAN Drive Tech a reliable partner for drive components that simply cannot be selected out of a catalogue. Test benches, railways, agricultural machinery and gantry cranes for aerospace equipment are just a few of the challenges that we deal with on a daily basis.

CUSTOMER BENEFITS

Our mission is to offer our customers the most reliable products, with the right level of customization, state-of-the-art design, delivered within the requested time, supported by local service closest to where it is needed. Choosing VULKAN Drive Tech means to choose innovation, technological leadership, and highly specific solutions with maximum customer benefit.



- **TAILOR-MADE SOLUTIONS** – We propose to our customers diversified systems solutions that can respond positively to their requirements in terms of products features, custom solution design, and the operating conditions and economy of the application. VULKAN Drive Tech provides the reliable products and related engineering services that your application needs.
 - **ENGINEERING** – We have considerable experience and knowhow regarding the most advanced braking technology and torsional & linear vibrations calculations and measurements. Besides the most advanced 3D CAD CAM systems that are used by our Design Department, we have developed state-of-the-art calculations programs to simulate product performances in relation to the specific application. More than fifty of our engineers dedicate themselves on a daily basis to fulfilling the requirements of our customers.
 - **IN-HOUSE TESTING** – VULKAN Drive Tech has in-house test center to perform either static or dynamic tests up to 5.000 kNm. This ensures we can back up the claims regarding technical performances that are listed in our catalogue, recreating the most severe operating conditions our products will face within their lifetimes. This strategic service is performed to implement our engineering know-how and create a new breakthrough into state-of-the-art power transmission and braking systems technology.
 - **PRODUCTION** – VULKAN Drive Tech comprises six wholly-owned manufacturing sites worldwide and this is where the core of our products come to life. International Quality Standards guarantee our customers that the Services and Products purchased from VULKAN Drive Tech are simply Top Quality Products which deserved to be branded with our “V” Logo.
 - **WORLD-WIDE SERVICE** – No less than 14 wholly-owned subsidiaries and more than 30 offices worldwide demonstrate the close contact we can offer to our customers. Our key areas of competence include application engineering, sales, after sales and technical support. Furthermore, service and spare part depots have been established throughout the world. And the shortest routes for material to their point of installation, as well as the flexibility and mobility of our technicians, ensure a prompt backup service all over the world.
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REQUIREMENTS

Overhead E.O.T. gantry cranes for general purposes (i.e. port cranes) or those used for special applications such as in the steelworks industry (i.e. roll mill & coil cranes, furnace loading cranes, ladle cranes, etc), require independent drives for hoist winches, trolley traversing and bridge travelling.

Each drive has specific requirements to which the couplings and brakes must comply: a high number of starting per hour, elevated number of reversals, limited space availability, large inertias and dynamic torque values, as well as synchronous torque transmission. Adverse environmental conditions also might require the use of so-called “storm brakes”, which guarantee the safety of the machinery during potentially dangerous weather conditions.



SOLUTIONS

To comply with most of the typical technical requirements of **VULKAN Drive Tech** has developed specific torsional rigid couplings, brakes and rail clamps, which focus on the following three main areas:

→ Endurance

To minimise service and machinery lay down costs, VULKAN Drive Tech submits its couplings, brakes and rail clamps to extensive endurance testing within its laboratories to prove both the reliability and long life of the components that are used. Furthermore, over 20 years of experience in the field of this application is a key factor in designing products which must guarantee the highest level of operation between maintenance service intervals.

→ Maximum flexibility

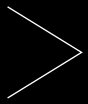
VULKAN Drive Tech can define the best tailor-made solution, from either a technical or economic perspective, and in doing so meet both the requirements and expectations of our customers. Couplings with an integrated brake disc, brake calipers that are dimensioned to comply with the operational requirements of cranes, and emergency brakes to guarantee the highest safety rate of customer operations, are all part of our system solution.



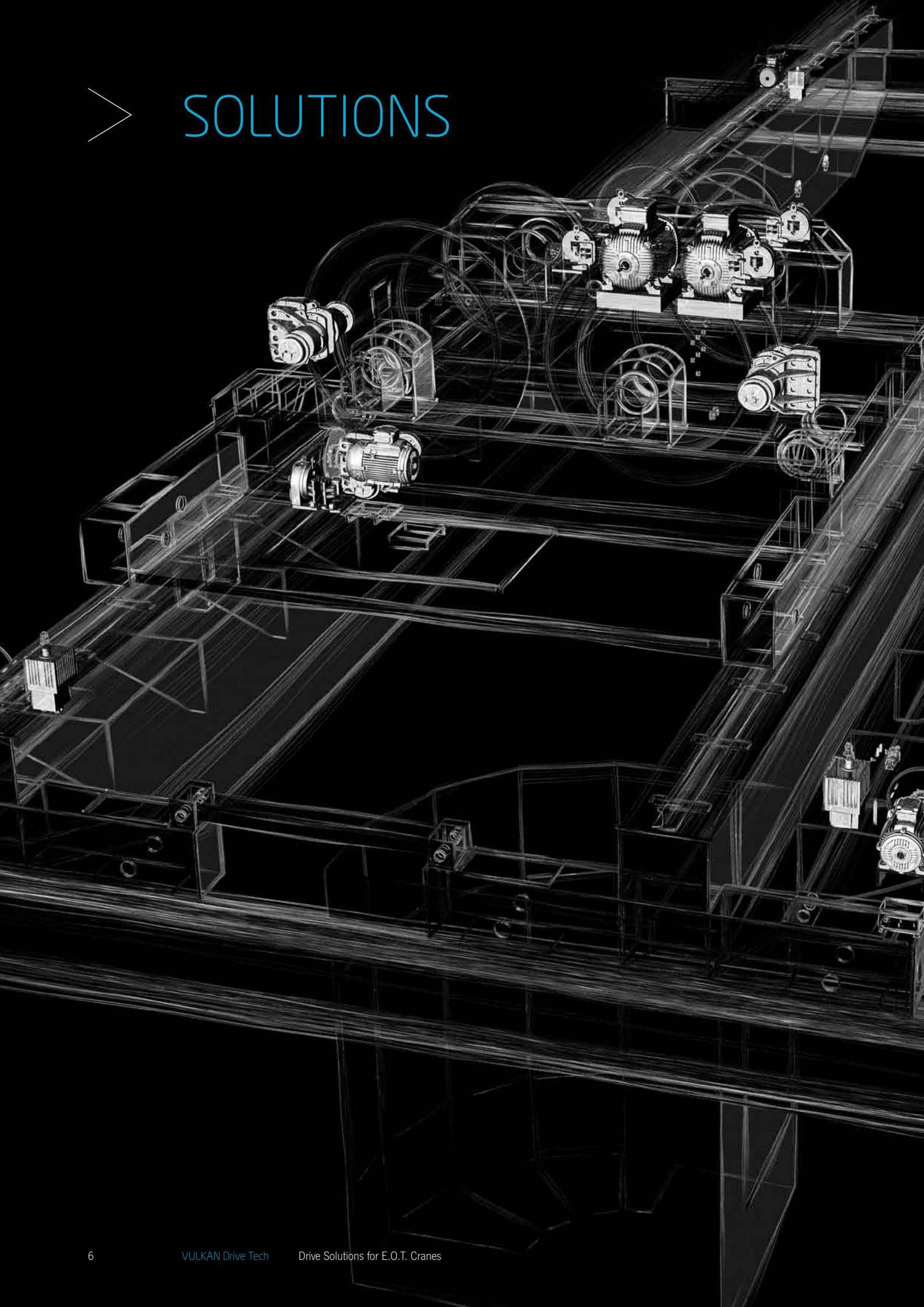
of overhead E.O.T. cranes,
couplings, service & emergency
major key aspects:

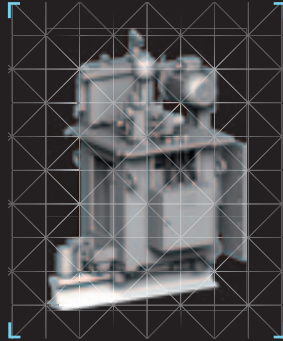
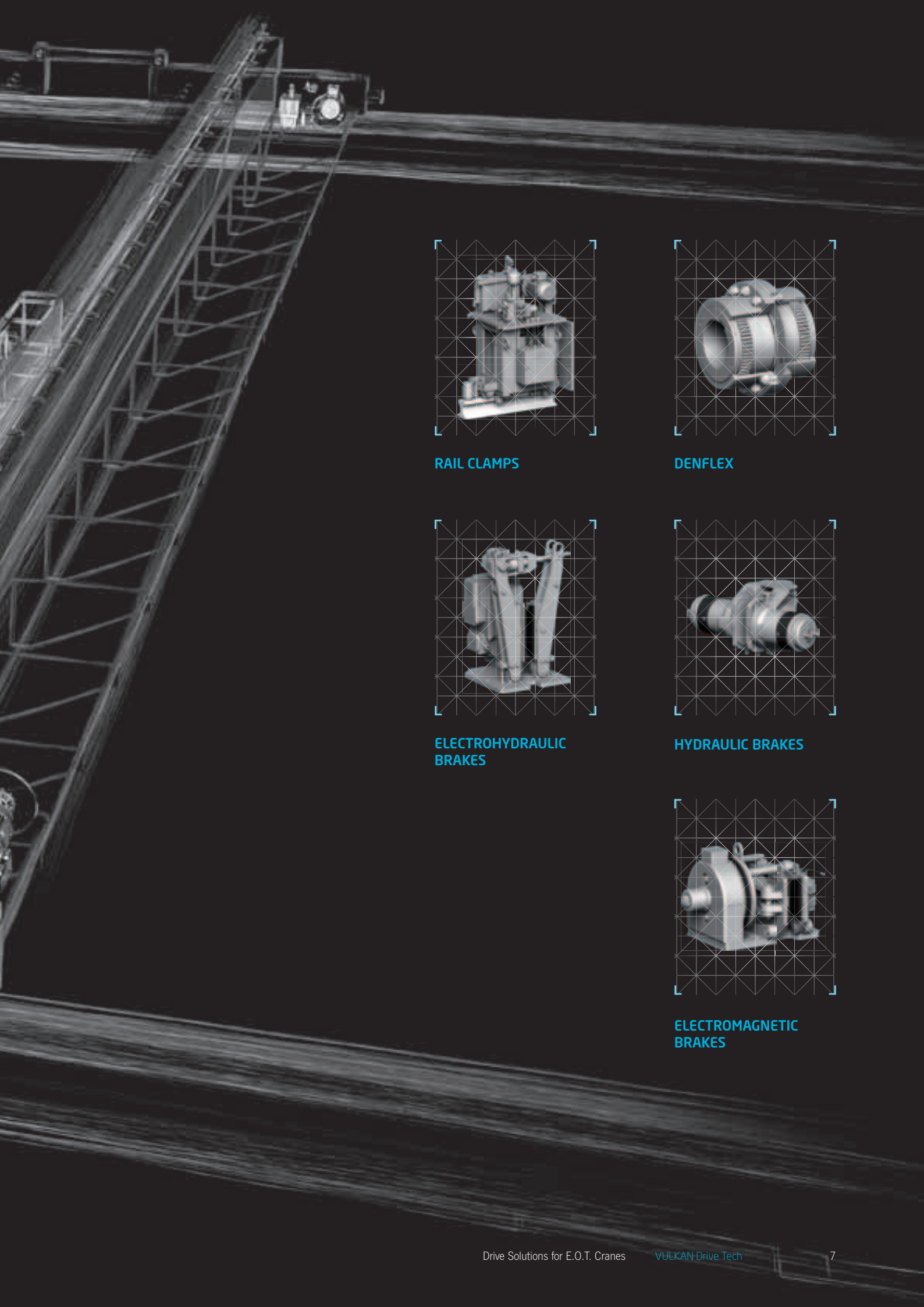
→ **Outstanding functionality**

Brakes are specifically designed to be manually operated in emergency conditions, so as to guarantee the highest safety rate of operators, machinery and load. Thanks to the specific design of the coupling, motors can be serviced and decoupled from the drive. This enables the coupling itself to be dismantled by keeping the service brake applied onto the disc of the coupling. These are just a few examples of the design optimisation that lead to outstanding functionality of VULKAN Drive Tech products for E.O.T. Cranes.

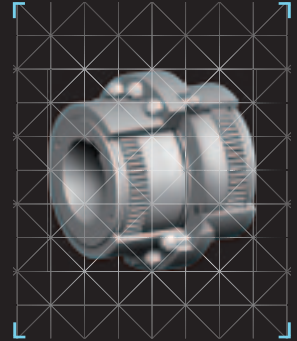


SOLUTIONS

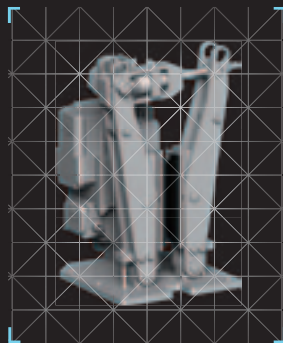




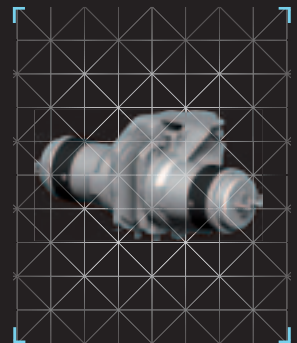
RAIL CLAMPS



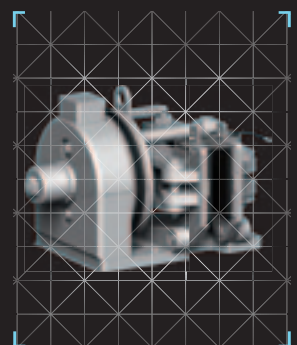
DENFLEX



**ELECTROHYDRAULIC
BRAKES**



HYDRAULIC BRAKES

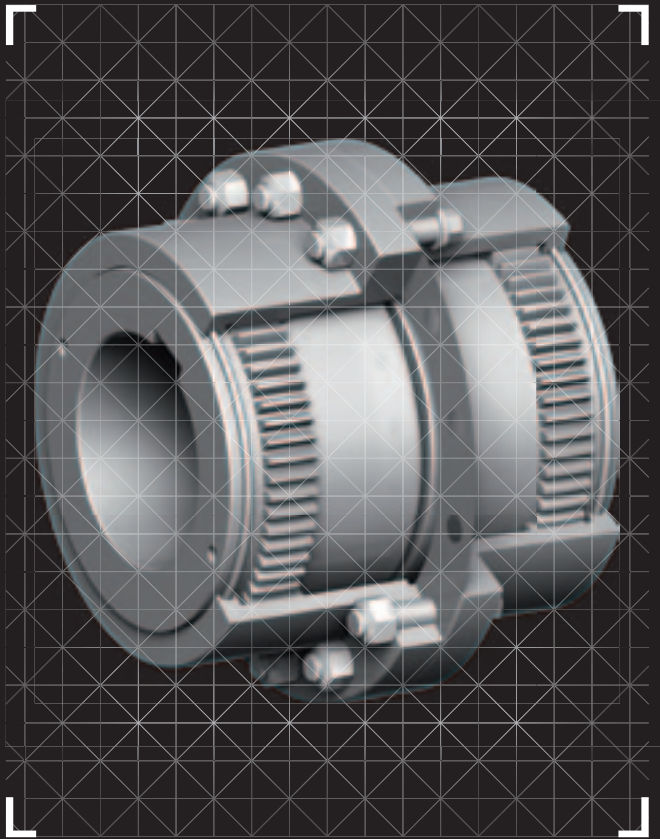


**ELECTROMAGNETIC
BRAKES**



DENFLEX

Nominal Torque Range: 1.00 – 560.00 kNm



DENFLEX

DENFLEX is a tooth gear coupling that is torsionally rigid and used for synchronous torque transmission. The tooth gear profile allows the transmission of high torque values within minimum sizing of the coupling and compensates axial, radial and angular misalignments with low reaction forces generation.



It is particularly suitable for low speed shaft applications

where high torque within limited size and weight is mandatory. The modular design of its components allows a huge variety of design compositions, which in turn fit even the most demanding applications.

The tooth profile is the core of this coupling and DENFLEX features a specific design that guarantees the minimum surface contact area between teeth. This ensures that friction and the consequent wearing of the parts is reduced, hence increasing the lifetime of the product. The spline design of the tooth sleeves allows DENFLEX to compensate high axial misalignments; in addition, the round tooth profile compensates either radial or angular misalignments as well. A complete system of sealings and gaskets prevent the gears area from becoming contaminated by dust or aggressive elements that could reduce the internal lubricant lifetime or even damage the gears.

DENFLEX, with standard lubrication, can be used for an operation environment temperature ranging from -10°C up to 90°C. Meanwhile, special lubrication is available on demand for more extreme environmental conditions. The reduced number and modular design of the components make DENFLEX a highly customisable product. Indeed, it is available in more than 30 different versions and 17 sizes that are suitable for shaft accommodation up to $\varnothing 450$ mm.

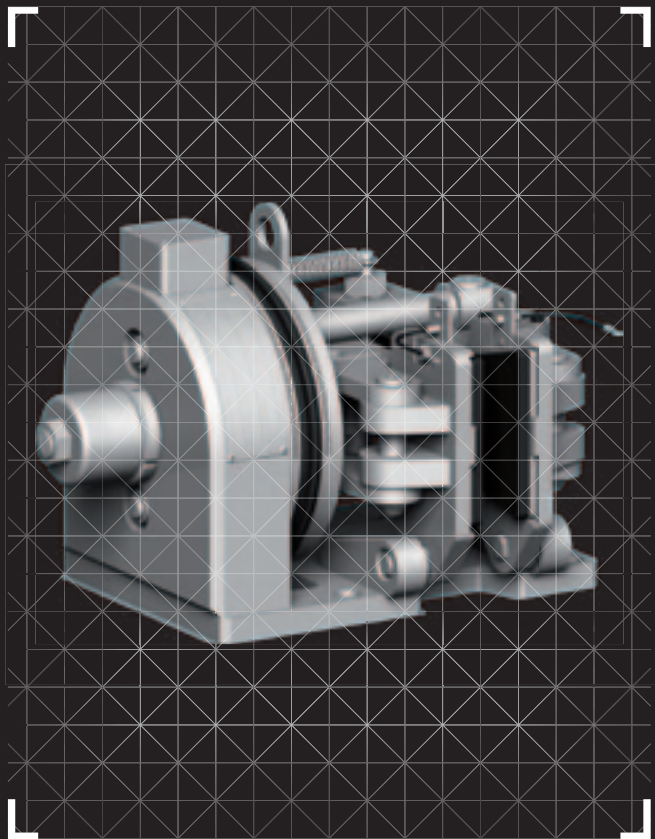
A special version is also available on demand that features hardened teeth and is able to transmit an additional 30-40% (depending on size) of torque, within the same dimensions of the standard coupling.

FEATURES

- Synchronous torque transmission.
- High torque transmission within limited dimensions.
- High axial misalignment capacity with minimised reaction forces to the connected machinery.
- Modular Design with high customisation degree possibilities.

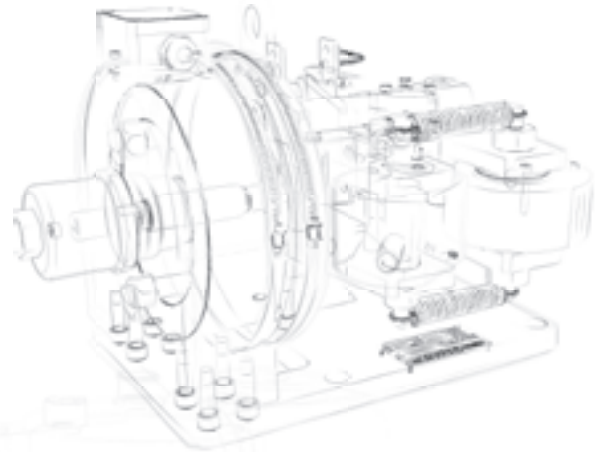
ELECTROMAGNETIC BRAKES

Nominal Torque Range: 0.01 – 25.00 kNm



ELECTROMAGNETIC DISC BRAKES

Large fans machinery might require service and parking brakes due to the high inertias of the machinery components. VULKAN Drive Tech has a wide range of failsafe ELECTROMAGNETIC BRAKES used for this scope, which are specifically designed to comply with service, parking or emergency working profiles.



Each brake model can be equipped with a variety

of accessories to comply with the most demanding applications that require reliable product performances within the most extreme operating conditions. The VULKAN Drive Tech power supply portfolio completes the brakes product range that we are able to offer.

VULKAN Drive Tech ELECTROMAGNETIC BRAKES are failsafe brakes that are available in either disc or drum configuration (AISE 11 Standard). They have been designed to ensure a minimum operating reaction time of 0.2 seconds and to support repetitive braking operations up to 700 cycles per hour. Laboratory tests have shown that VULKAN Drive Tech brakes are maintenance-free for up to 4,000,000 cycles. VULKAN Drive Tech offers the following main customisation possibilities: Automatic lining wear compensation system, brakes position sensors, pads worn

out sensors, automatic or manual brake release mechanism, organic and sintered pads that are asbestos-free. Furthermore, the complete range of solid and self-ventilated discs with integrated flexible couplings are also available and these complete the scope of supply.

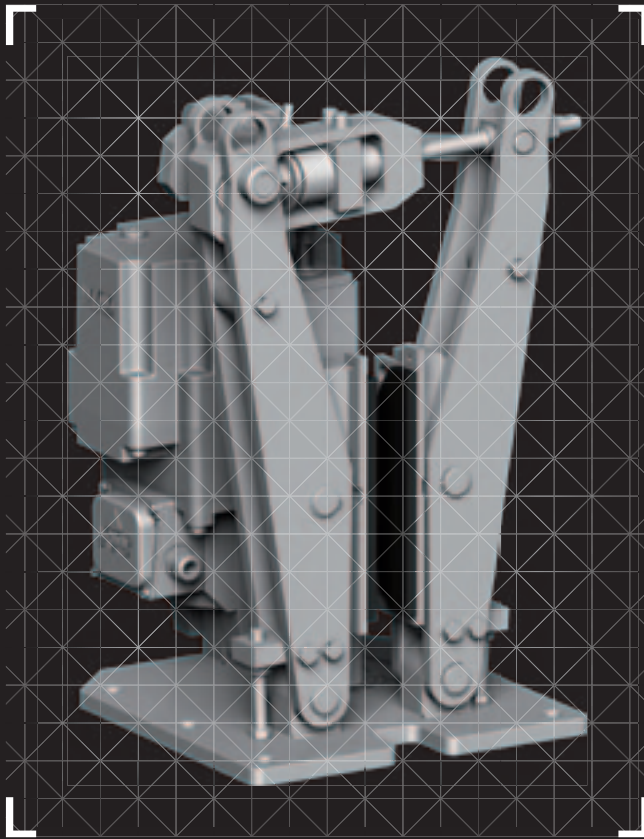
Each brake is equipped with a power supply unit to operate it; as regards the calipers, the power supply units can also be equipped with different electric/electronic circuits to better suit the specific requirements of the applications.

FEATURES

- Negative or failsafe brakes.
- Available either in disc or drum configuration.
- Suitable for either service or emergency operation.
- Up to 700 operations per hours.
- Response timing of 0.2 sec.

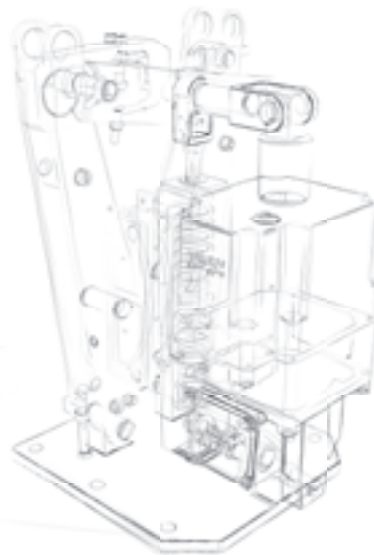
ELECTROHYDRAULIC BRAKES

Nominal Torque Range: 0.20 – 17.80 kNm



ELECTROHYDRAULIC DISC BRAKES

When service brakes do not require a high degree of manoeuvring, a useful alternative to ELECTROMAGNETIC BRAKES could be ELECTROHYDRAULIC BRAKES. Available in either a disc or drum configuration, VULKAN Drive Tech ELECTROHYDRAULIC BRAKES are of a failsafe type and do not require the combined installation of a power supply to operate the caliper, which means an economic advantage at installation.



A wide range of accessories is also available for this product family, which includes automatic lining wear compensation system, pads worn out control and sintered pads. Our applications engineering desk will provide the right configuration according to the specific requirements of the customer.

VULKAN Drive Tech ELECTROHYDRAULIC BRAKES are spring applied and released by means of an electrohydraulic thruster that can be fed by 220-380 or 440 VAC and that has been designed according to the DIN 15430 standard. The nominal braking torque value can be manually adjusted in order to properly fit each application and the electrohydraulic thruster can be equipped with delay valves for smooth braking operation.

The ELECTROHYDRAULIC BRAKES family is available in three different caliper sizes, seven different thruster models and 13 disc configurations. This ensures that the braking features of each caliper can be properly set. Furthermore, it is possible to manually adjust the nominal braking torque value of each brake to fine tune the performance of the brakes on-site.

Automatic lining wear compensation system, brakes position sensors, pads worn out sensors, automatic or manual brake release mechanism, and asbestos-free organic and sintered pads, are the main customisation possibilities that VULKAN Drive Tech offers.

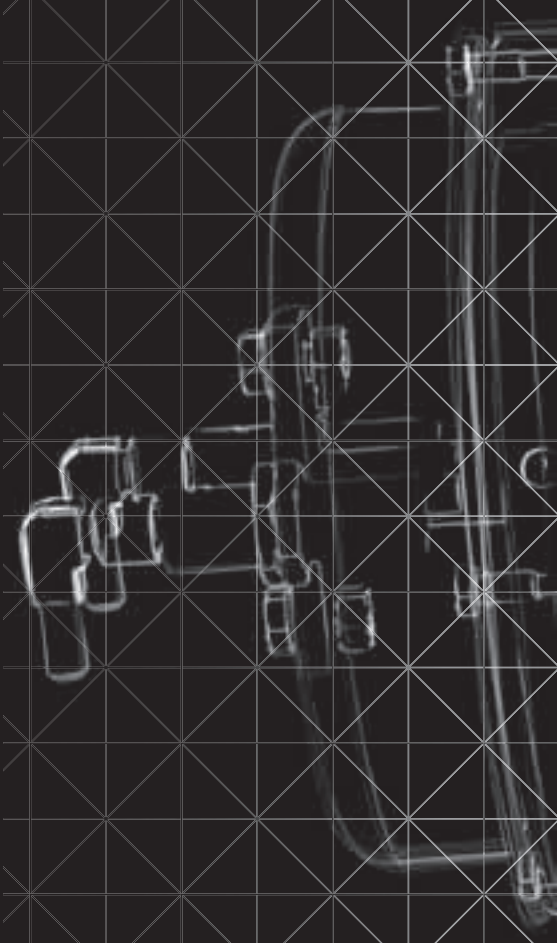
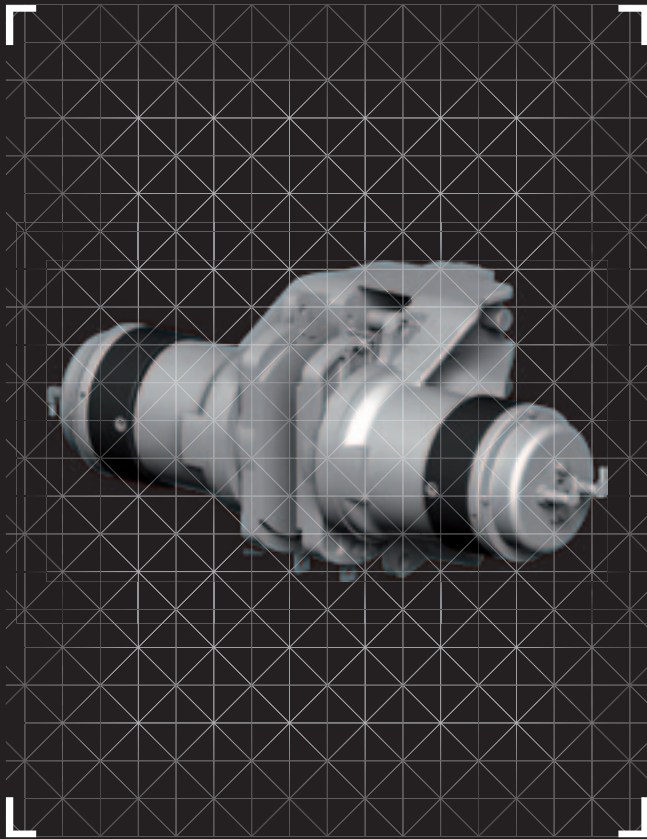
FEATURES

- Features Box.
- Available either in disc or drum configuration.
- Compliance to DIN 15430 standard.
- Modular Design to fit different thrusters within the same caliper.
- Easy installation.



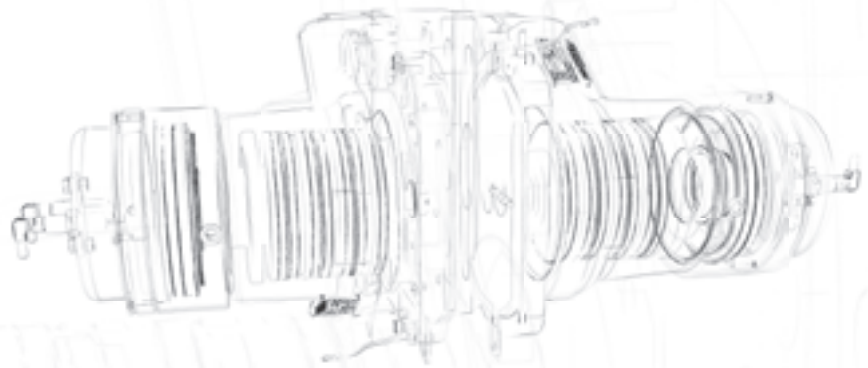
HYDRAULIC BRAKES

Nominal Torque Range: 0.11 – 171.00 kNm



HYDRAULIC DISC BRAKES

Regenerative conveyors need braking systems that are capable of preventing overspeeding of the belt during normal operations and emergency stopping in critical conditions. As proportional braking and high dynamic torque due to machinery inertias are the main features to be considered, HYDRAULIC BRAKES are the prime products for this application.



The VULKAN Drive Tech HYDRAULIC BRAKES portfolio includes a wide range of calipers with all of the relevant accessories, such as a hydraulic power pack, electronic control unit and special electronic braking monitoring system that is able to continuously control the speed of the conveyor and apply proportional braking torque. This prevents overspeeding and guarantees the belt will stop within the desired time without overstressing of the belt itself, regardless of the load percentage of the conveyor.

VULKAN Drive Tech HYDRAULIC BRAKES are available in either positive (hydraulic applied and spring released) or negative (spring applied and hydraulic released) configuration and in single spring design for disc floating conditions, or double spring design for fixed disc conditions. The SH line is the prime product used for emergency operations into the belt conveyor. Available in nine different sizes, this double

spring caliper can be easily installed on any disc diameter and thickness thanks to its adjustable design. A manual lining wear compensation system, brakes position sensors, pads worn out sensors, manual brake release mechanism, and organic and asbestos-free sintered pads are the main customisation possibilities offered by VULKAN Drive Tech.

VULKAN Drive Tech also provides a wide range of hydraulic power packs with different hydraulic performances such as the simple “On/Off” CH1 circuit or the most complex and sophisticated CH6 “Digital Proportional Braking system” which has the possibility of several custom accessories.

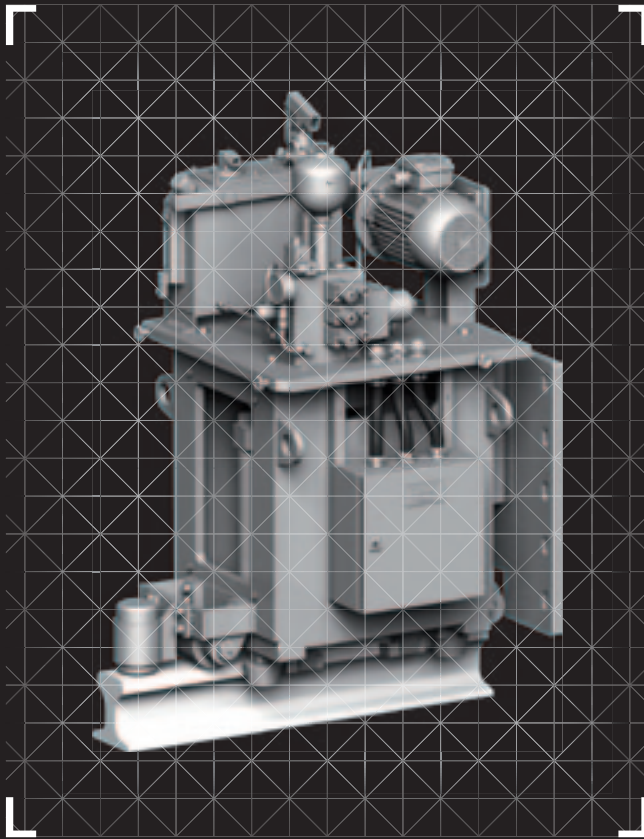
FEATURES

- Mono & dual spring characteristics.
- Complete electronic logic to suit the most demanding requirements in terms of proportional braking capacity.
- Customised hydraulic power pack.



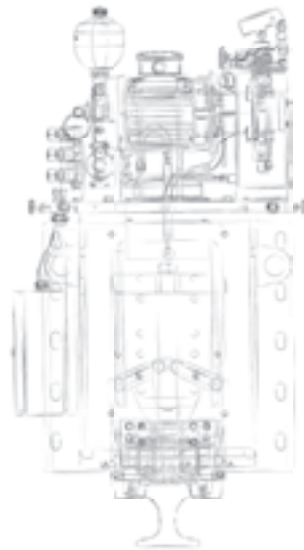
RAIL CLAMPS

Nominal Torque Range: 50.00 – 400.00 kNm



RAIL CLAMPS

Also known as the “Storm Brake”, this product is largely used on port cranes, stackers, reclaimers and gantry cranes, where extreme winds might affect stability. They provide stability during abnormal operating conditions by literally clamping the crane to its foundations: rails.



VULKAN Drive Tech Rail Clamps are composed of a spring applied or counterweight applied brake, which is then hydraulically released. The hydraulic power pack is designed in such a way as to guarantee the clamp remains open without requiring the frequent starting of the motor. This prolongs the lifetime of the hydraulic valves and components in general. To stop the clamps from accidentally closing, they are equipped with “open/close” status sensors, and there is also a flow control valve used, the purpose of which is to enable time controlled closing during clamping. Available in seven different sizes, VULKAN Drive Tech Rail Clamps are supplied to match a specific rail profile and can be designed for either front fastening or top fastening installation.

VULKAN Drive Tech Engineering is available for the design and selection of rail clamps, which are based on the wind requirements of single projects and machinery layout.

FEATURES

- Spring or counterweight design.
- Front or top fastening design.
- Hydraulic power pack included.
- Application engineering assistance.

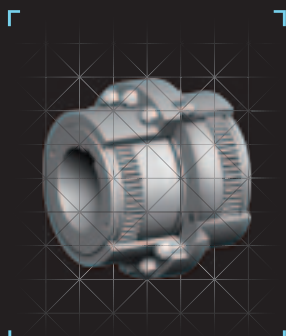


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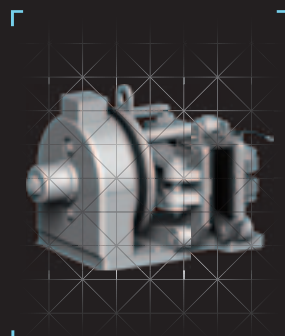


PRODUCT RANGE

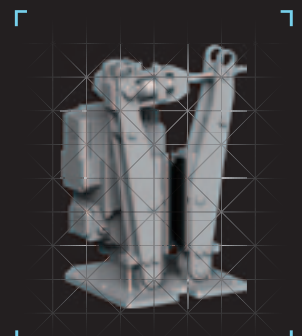
For E.O.T. Cranes



16 DENFLEX



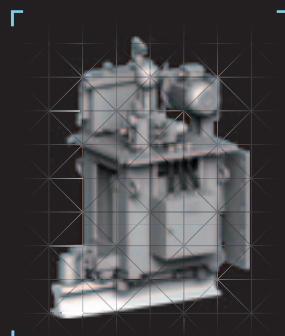
21 ELECTROMAGNETIC BRAKES



25 ELECTROHYDRAULIC BRAKES



24 HYDRAULIC BRAKES



27 RAIL CLAMPS



Market		Oil & Gas		
Application		Compressors Blowers	Pumps Fans	
HIGHLY FLEXIBLE COUPLINGS	1	RATO S	•	
	2	RATO R	•	
	3	RATO DS	•	
	4	EZR		
	5	VULASTIK L	•	•
	6	VULKARDAN E		•
	7	VULKARDAN L		•
	8	VULKARDAN P		•
	9	INTEGRAL SHAFT SUPPORT		
FLEXIBLE COUPLINGS	10	MEGIFLEX B	•	
	11	PINOFLEX NP	•	•
	12	SPEFLEX N		•
	13	FLEXOMAX G		•
	14	FLEXOMAX GSN		•
	15	FLEXOMAX GBN		•
RIGID COUPLINGS	16	DENFLEX		
	17	DISCFLEX	•	•
DRIVELINE COMPONENTS	18	COMPOSITE SHAFTING		•
BACKSTOPS AND FLYWHEELS	19	HIGH SPEED BACKSTOPS		
	20	LOW SPEED BACKSTOPS		
BRAKES	21	ELECTROMAGNETIC DISC BRAKES		•
	22	ELECTROMAGNETIC DRUM BRAKES		•
	23	PNEUMATIC DISC BRAKES		
	24	HYDRAULIC DISC BRAKES		
	25	ELECTROHYDRAULIC DISC BRAKES		
	26	ELECTROHYDRAULIC DRUM BRAKES		
RESILIENT MOUNTS	27	RAIL CLAMPS		
	28	T SERIES	•	•
	29	VD SERIES	•	•
	30	MG SERIES	•	•
	31	SPRING MOUNTS	•	•

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