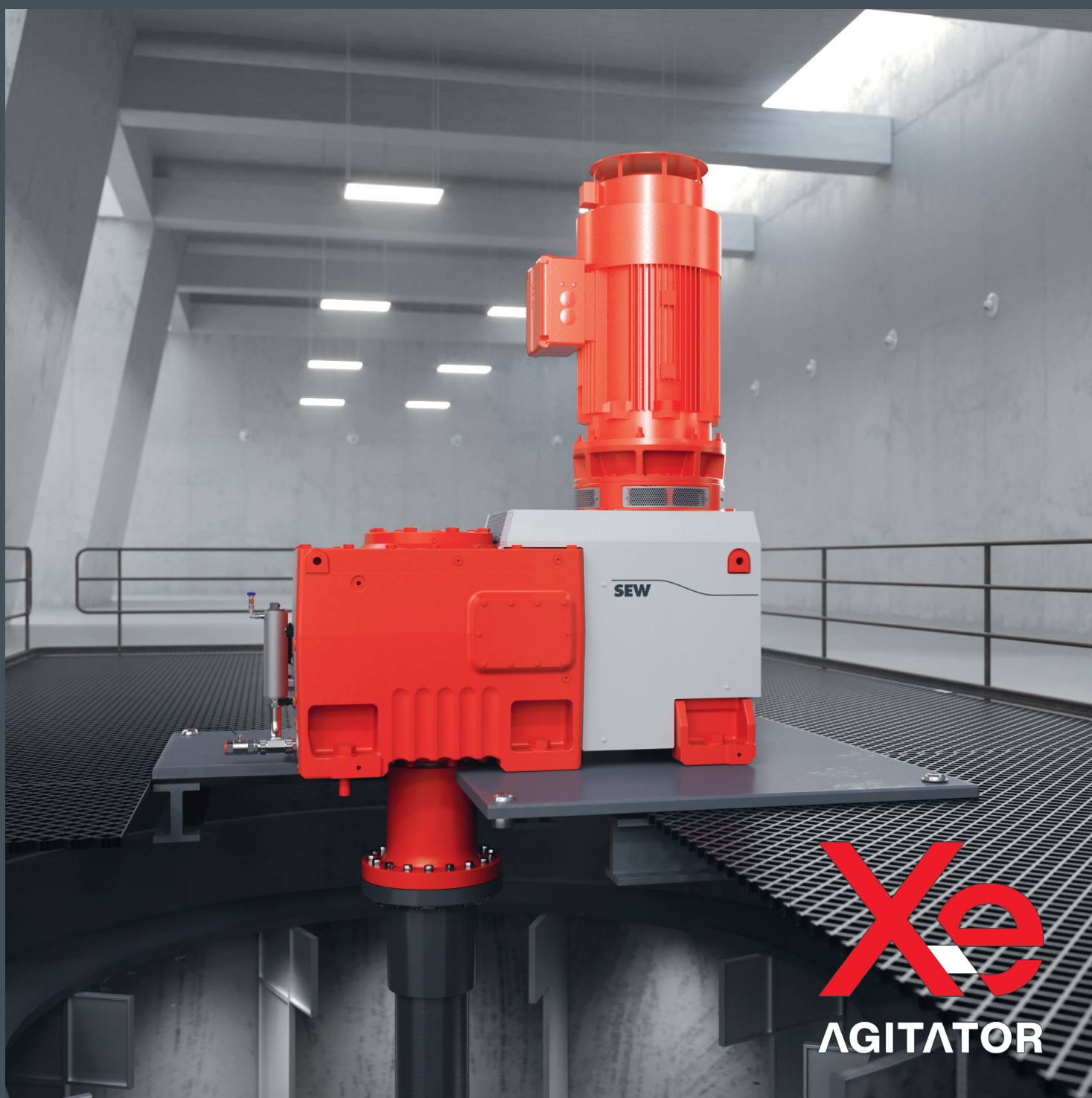


Purpose Designed Agitator and Mixer Drives

Complete separation of torque rating from rotating overhung loads



Xe
AGITATOR

Evolving Practices

The Past: Challenges of Outdated Practices

High service factor does not equal longevity

In the past, engineering companies and OEM's would specify a high service factor to ensure that a baseline standard is met when selecting a generic gearbox for mixing applications. This service factor can be very misleading as it's purely a measure of the ability for the gearbox to transmit torque without considering the effect of external loads.

Catalogued or otherwise published service factors of gearboxes from various manufacturers cannot be compared directly with each other as the definitions vary and service factors are a gearbox manufacturer's own measure.

Agitators and mixers have rotating overhung loads of varying magnitude that can sometimes be severe.

These rotating overhung loads not only directly stress the output shaft and output bearings, but also affect the housing, resulting in unwanted deflections which interfere with the gear mesh of all stages. This derates the gear train's ability to transmit the rated torque and is historically why higher service factors (generally between 2.0 and 2.5) are specified by the market to counter this effect.

As a result, the higher service factor will require a larger and stronger housing which in turn reduces the unwanted deflection in the gear train. This requirement originated from industry experience using generic gearboxes in agitating and mixing duties. There is no real science behind it other than "bigger is better" as the physical size of the output shaft and supporting housing matters when it comes to agitating and mixing.



Evolving Practices

The Present: A Breakthrough in Efficiency

Introducing the purpose designed agitator and mixer drive

The purpose designed SEW-EURODRIVE X.e Agitator and Mixer Drive completely separates the high-speed gear train from the low-speed output shaft which is subjected to the rotating overhung loads. The housing is specially designed to deal with excessive rotating overhung loads with minimum deflection as well as accommodating larger output shafts and bearings.

The housing integrity of the SEW-EURODRIVE X.e Agitator and Mixer Drive has been checked with modern FEM software to quantify and limit these deflections [Figure 1]. This has also been verified by performing real life simulations on the world's first and only load test rig for gearboxes, which can also apply defined rotating overhung loads [Figure 2].

Figure 1

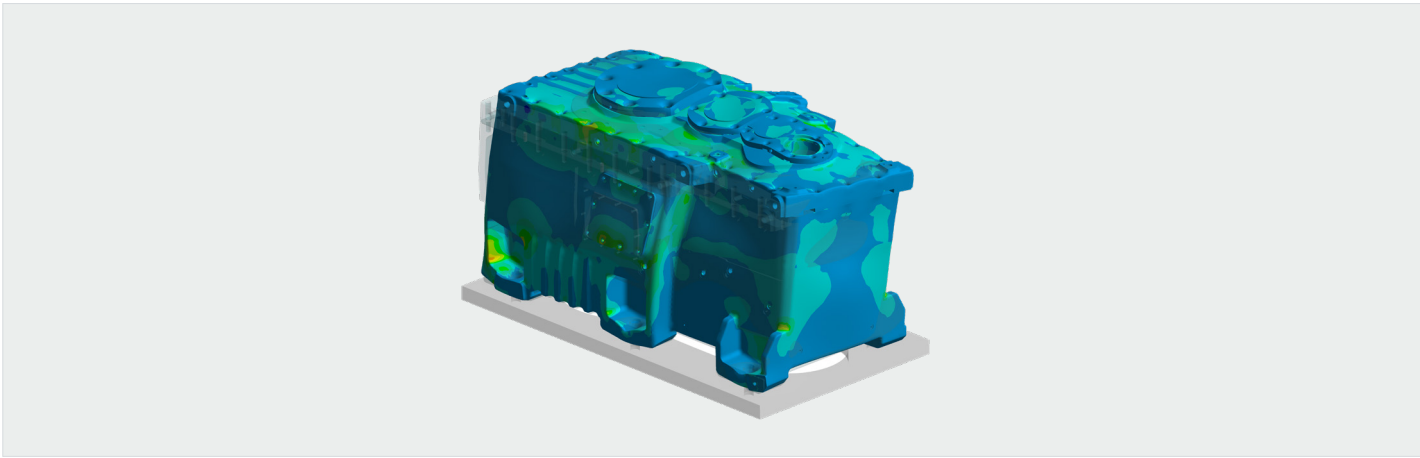
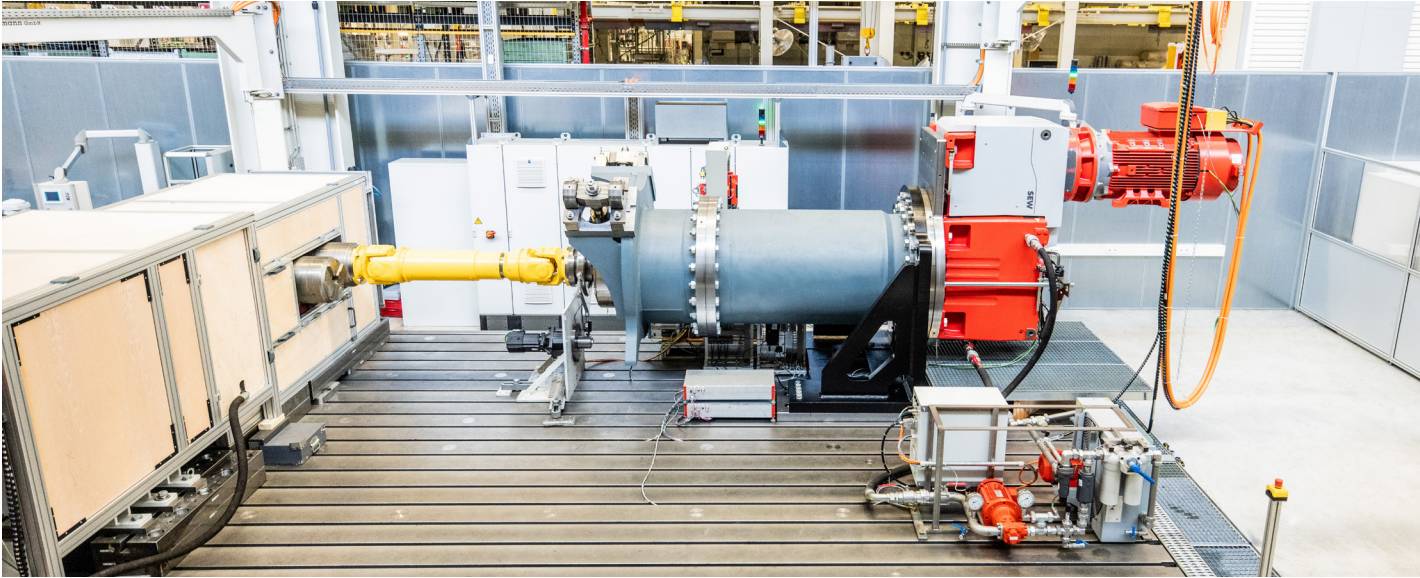


Figure 2



Selection Process

Selection of the purpose designed agitator and mixer drive

The selection process is divided into two stages, by the clear separation of the gear train (torque) from the purpose designed low speed shaft & bearing arrangement (overhung loads).

Stage 1: The Torque

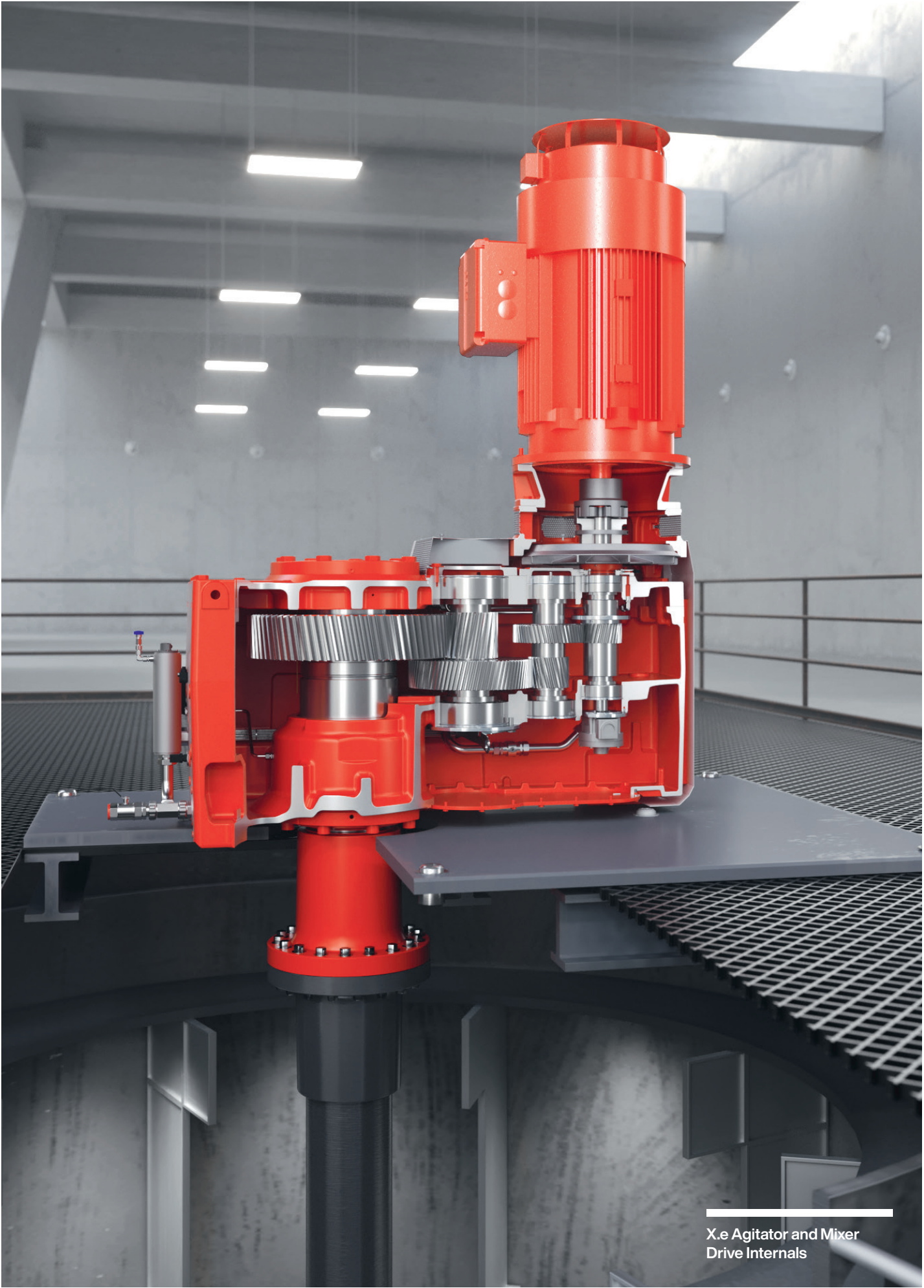
The drive is simply selected by the service factor from the catalogue, similar to universal gearboxes. A service factor of 1.5 or above will result in infinite gear life under the designed loads.

In the absence of gearing deflections caused by external loads, this service factor has proven to be sufficient in the industry in practice. A higher service factor will not achieve any benefit.

Stage 2: The Overhung Loads

No two mixers or agitators are ever built the same. The rotating overhung loads i.e. radial loads, bending moments, thrust & peaks vary greatly and are unique to every application.

Based on these loads, the low-speed shaft size and bearing arrangement are then selected to optimise shaft safety against fatigue, and ensuring the desired bearing life is met.

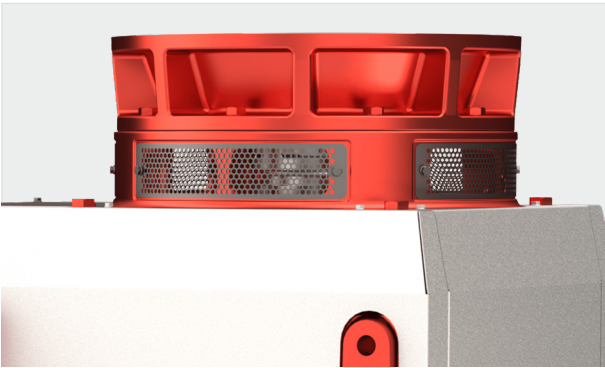


X.e Agitator and Mixer
Drive Internals

Benefits

This new revolutionary 2 stage selection process provides optimum performance, removing the risk of over or under sizing the gear unit. Every part of the drive train is optimised for the application without compromise.

Additionally, there are multiple significant benefits of the SEW-EURODRIVE X.e Agitator & Mixer Drive.

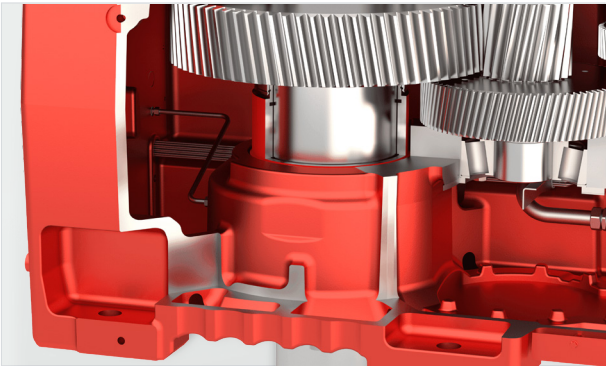


Optimised airflow for fan cooling

External coolers are seldomly required.

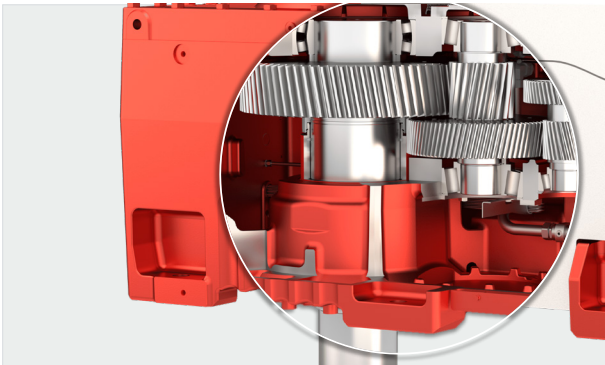
Drywell

A riser tube over the low speed shaft traps the oil in the sump eliminating any risk of leaking.



Multiple shaft and bearing arrangements

Optimised shaft strength and bearing life without over or under sizing any components.



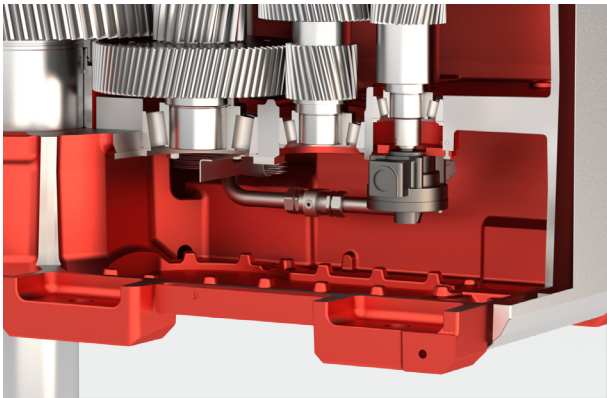
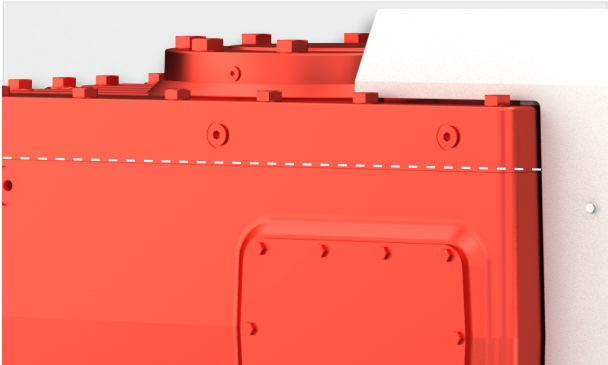
Benefits

Split line above oil level

Makes it physically impossible for oil to leak out of the gearbox split-line gasket.

Fully draining Sump

Typically, universal housings have pockets that will never drain, contaminating new oil after an oil change. The X.e/HM mixer housing drains 100%, eliminating contamination of new oil.



Internal Pump

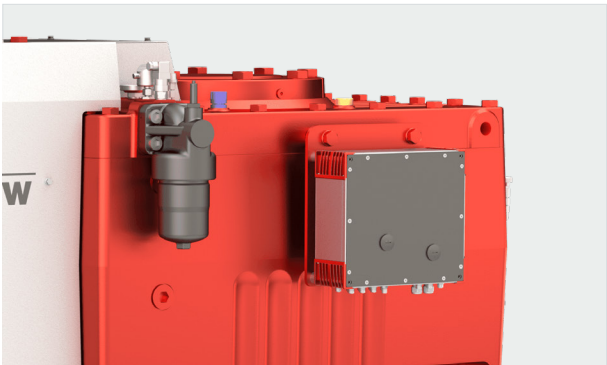
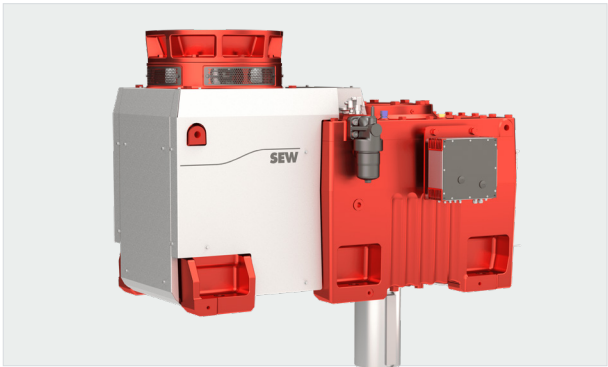
Protects the pump from the elements and eliminates the risk of an oil leak, improving reliability.

Immediate Oil Delivery

Unlike traditional pressure lubricated systems that require recurring priming, oil delivery is instant after the first start-up, protecting the bearings and gears from premature wear.

Easy Maintenance

Whilst piping is inside the gearbox, all relevant maintenance components including filter, grease nipples and instruments are located externally in a single and easily accessible location. Several inspection openings are provided in convenient locations.



Fully integrated filter and instruments

Minimises the risk of damage and leakage.

DriveRadar® ready

All mounting provisions for DriveRadar® instruments and edge processing unit are integrated. This enables predictive maintenance of your X.e agitator and mixer drive via digital twin.



Company Background

The SEW-EURODRIVE group is a global designer and developer of mechatronic transmission systems and motor control electronics, headquartered in Bruchsal, Germany. It's broad spectrum of integrated solutions includes geared motors and gear units, high torque industrial gear units, high-efficiency motors, electronic frequency inverters and servo drive systems, decentralised drive systems, plus engineered solutions and technical support/training.

The Australian division of SEW-EURODRIVE is headquartered in Melbourne and is supported by a network of sales and service facilities in Sydney, Brisbane, Mackay, Perth, Adelaide and Newcastle. The company's customer base includes large-scale corporations and smaller entrepreneurial enterprises across Australia.

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