The flange couplings TAS-FKE are mainly used for conveyor drive systems under adverse environmental conditions.

Makeover for flange couplings

TAS-Schäfer's TAS-FKE rigid flange couplings are stronger, less complex and have better corrosion protection than their predecessors. Here is an insight into the development process.

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The flange couplings of the existing FK series from TAS-Schäfer are getting old and adaptations to permanent growing requirements are limited. In addition, the proven design is now also offered by various manufacturers in a similar form. Reason enough for TAS-Schäfer to start a new development. With the design of the FK series TAS often faced some limitations that had to be eliminated or circumvented. Not all applications could be implemented with the existing coupling system. This finally led to the decision to develop a new product line.

The new product should be able to replace the existing FK series completely, thereby eliminating their disadvantages as good as possible, but keep their strengths at the same time.

In order to achieve this goal, feedback from users as well as technical requirements of various projects were collected and evaluated over the years. Additional to many desired detail improvements, the customers have also paid special attention to the high demands of the use.

Use on heavy drives of large conveyor belts

The largest field of application of such couplings is the connection of heavy drives to large conveyors, as used in the extraction of raw materials and for the transport of e.g. ores and coal. In addition, the couplings are used for stirring systems, in hydropower or for attaching of huge brake discs.

Exposed to high loads

The load on the components is high and they are often exposed to unfavourable environmental conditions. Therefore, the couplings must be robust and durable. From these data, TAS-Schäfer derived the most important technical requirements for a new development:

- Higher load capacity (bending)
- Better corrosive protection
- Improved handling
- Compatibility with the FK series

A higher load capacity was achieved by optimizing the geometries and changing the load distribution within the system. The improvement is between 70% and 115% - in relation to the old FK series. This means that in many cases, a reduction of the product size is possible, which leads to cost advantages.
In addition, many solutions of other own products could be transferred to the new development. An example of this is the newly developed clamping tool for the TAS-FKE series, which is mainly based on the knowledge from the hydraulic shrink disk TAS-SHS. The first test of the hydraulic tool exceeded expectations. The installation time of a medium-sized flange half could be reduced to a minimum. The otherwise required time of about 140 minutes for clamping the shrink disk was shortened with the hydraulic tool to just below twelve minutes. The tool can be removed and is therefore reusable.

Performance improvement confirmed

A first medium-sized prototype has been designed, manufactured and tested. He fulfilled all expectations. At the same time, the requirements for the new development of the FKE series were validated in cooperation with a major user of such couplings and the results were convincing as well. FEA analyses which were carried out by an external computational specialist also demonstrated the expected performance improvement. In the meantime, the new FKE flange coupling has been successfully used in various projects.

The FKE coupling (above) has an integrated pressure ring that completely replaces the shrink disc. This is tightened through the flange, which allows shorter shaft ends and reduces the couplings weight. (Image: TAS-Schäfer)

The FK coupling has an additional shrink disc that is tightened from the rear of the coupling. (Image: TAS-Schäfer)

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