

# TEADIT<sup>®</sup> 2005 – Harsh Chemical Agitator CASE HISTORY

## INDUSTRIAL SEGMENT

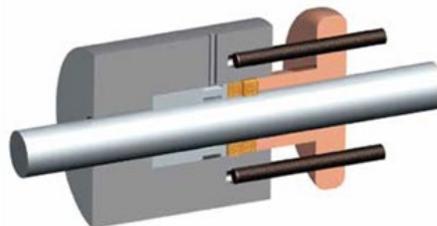
Petrochemical

## APPLICATION

Fluid: Harsh Chemicals

## Equipment

Agitator (Shaft Ø 5.8")



## SCENARIO

A major chemical processing customer was experiencing media leakage of harsh chemicals from packing on some of their agitators. Large diameter agitators such as this can pose many challenges for braided packing sets. This type of equipment often suffers from shaft alignment issues as well as worn or damaged shafts which can be difficult scenarios for braided packing to be successful in. This specific application posed another challenge in the form of the packing configuration being utilized in the equipment. Previously the customer had been utilizing a packing configuration consisting of 10 rings of PTFE packing. A configuration with a high amount of packing rings such as this can lead to an insufficient amount of load being applied to each ring. In packing sets the load / stress applied is greater at the rings closest to the gland follower and will decrease for each ring further away from the top ring. Therefore, packing sets with a higher number of rings will see a more uneven force distribution which will lead to an insufficient amount of load applied to each ring, especially those at the bottom of the stuffing box, which can affect the sets ability to create a good seal. It is a best practice to utilize no more than 5-6 packing rings per set if possible, to minimize the effects of the uneven load distribution common to packing. The customer supplied Teadit with a dismantled and individually packed packing set for analysis, which after investigation, showed the root causes of the leaks to be wear on the shaft and insufficient loading of the packing due to the large number of packing rings.

## **SOLUTION**

The customer reached out to Teadit looking for a solution to improve their sealability and run time of the equipment. Teadit recommended the use of new packing configuration consisting of Teadit 2005 packing alternated with rings of Teadit 24SH. It was also recommended to utilize a bushing / spacer in the bottom of the stuffing box to account for the space of 5 rings of packing. Teadit 2005 packing is manufactured from pure 100% expanded PTFE filaments with a PTFE dispersion, which provides low surface friction and helps prevent leakage through the braid. Due to its composition, Teadit 2005 is chemically resistant to most medias and is a proven solution for static and low speed applications in aggressive chemical service. Teadit 24SH is a multidirectional expanded gasket sheet, produced from 100% pure PTFE and is a proven solution is sealing applications with aggressive chemical services due to its resistance to most chemicals. The additional rings of Teadit 24SH alternated between the packing rings of Teadit 2005 have many benefits in the application. These rings help provide an additional sealing / protective element to the set, by creating an additional seal tight against shaft in addition to the packing rings, as well as provide stability to the set by limiting the packings ability to extrude, which is common in soft packings made of expanded PTFE. One of the key changes recommended by Teadit was the addition of a bushing / spacer to take up the space of 5 rings of packing, which limits the amount of packing rings to 5 and allows for better load / stress distribution on the packing. Additionally, Teadit suggested to repair the worn / damaged shaft as worn shafts can be very challenging for braided packing, especially those made of PTFE as it is a softer material that tends to get damaged easily with worn shafts. Teadit also recommended a controlled installation following industry best practices, as this is a key for an effective seal in any application.

## **CUSTOMER GAINS**

The combination of benefits found in the packing set recommended by Teadit have proven to be an excellent solution for the customer. The new packing set has provided greatly improved sealing performance compared to the previous set which was only able to last a few months in service before starting to leak. The addition of the bushing not only provided improved load distribution leading to better sealing, but also simplified assembly and disassembly of the equipment, therefore reducing maintenance time and cost. An installation training was provided

on site, showcasing Teadit's technical knowledge and value-added capabilities, in order to demonstrate packing installation best practices, which will not only aid in the success of this application but for all future installations on site as well. The success of Teadit's solution has greatly benefited the customer by eliminating the risk of accidents as well as significantly reducing the necessary maintenance of the equipment due to leaks of hazardous chemicals from the packing.