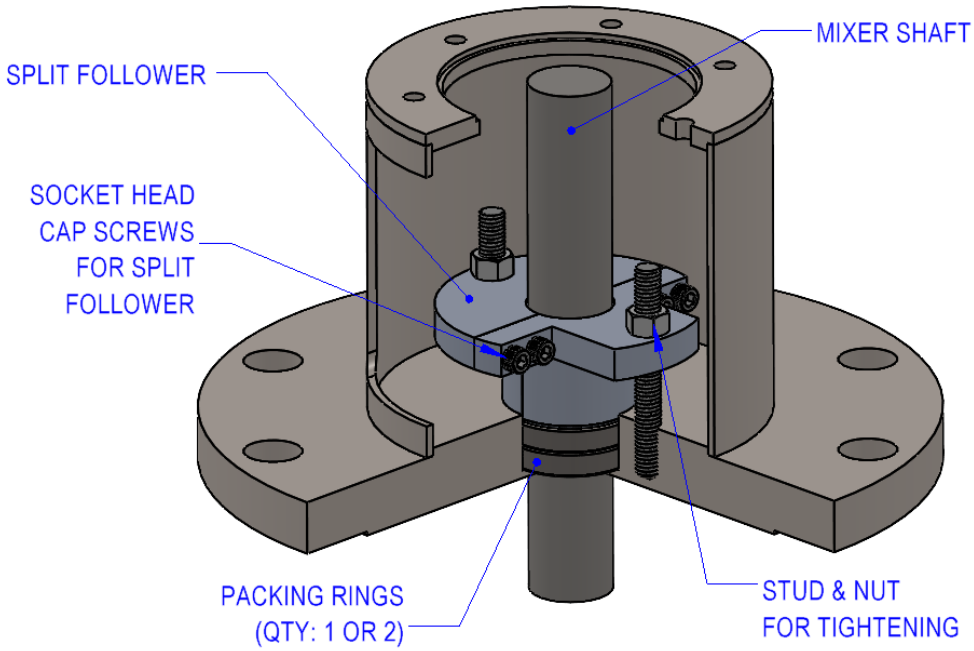
Stuffing Box Instructions

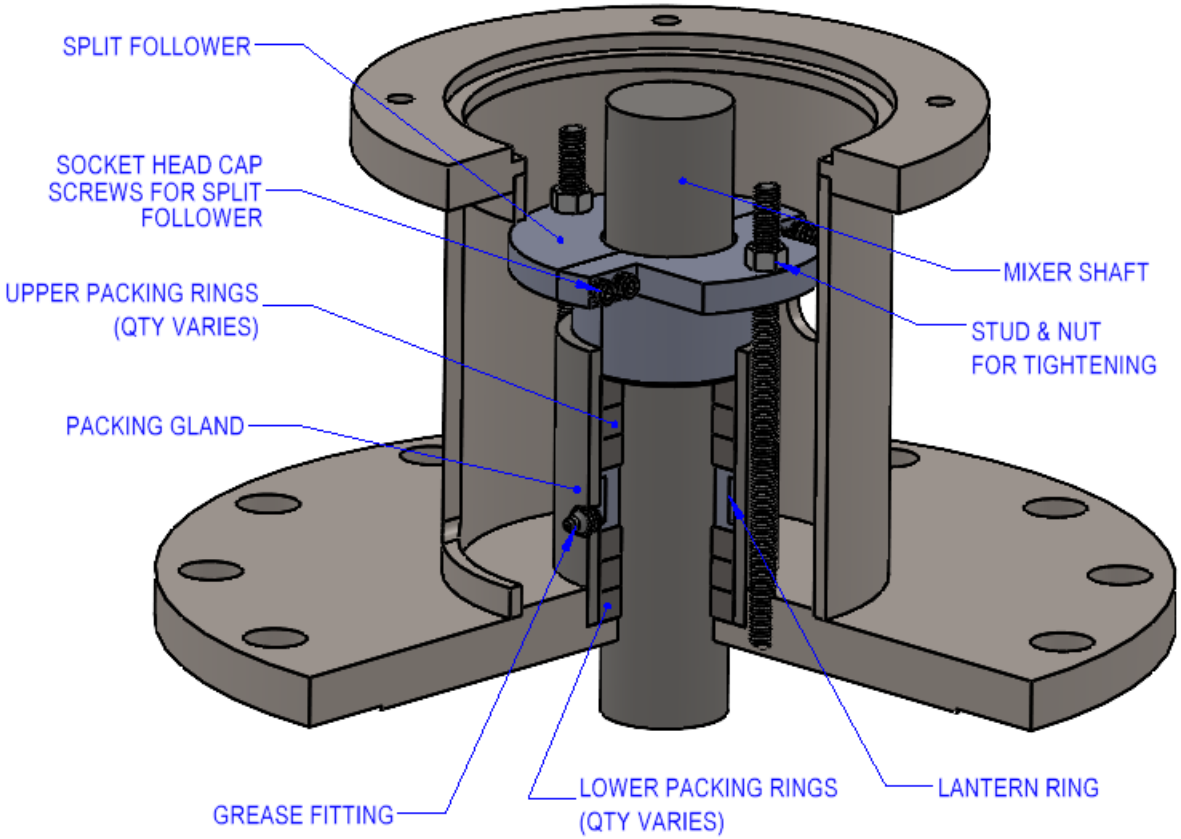
The basic elements of a stuffing box are shown in Figures – 1, 2 & 3. **A stuffing box is a controlled leakage device**. Tolerable leak rates will provide lubrication for most non-abrasive product applications. Your Fusion mixer may contain as few as one or two packing rings (Low Pressure Stuffing Box) or multiple packing rings (typically 5-7) with a lantern ring (High Pressure Stuffing Box). Consult your Fusion Approval Drawing or contact your Fusion Representative for your exact configuration. The stuffing box on your Fusion mixer will be fully assembled at the time of delivery and the gland nuts will need to be adjusted before your tank is filled.

Due to the design of a stuffing box seal, the packing rings involve contact with the rotating shaft. This friction will cause heat and wear. The process of adjusting stuffing box seals is important and tightening of the packing must done gradually to ensure the packing rings deform uniformly and fit close around the shaft. Over-tightening can cause excessive heat buildup, wear on the shaft and may cause an excessive load on the drive motor. Do not over-tighten gland nuts so there is no leakage as this will result in permanent scoring of the shaft. Periodically check leak rate and adjust with least force possible.

Low Pressure Stuffing Box – Figure 1



High Pressure Stuffing Box – Figure 2

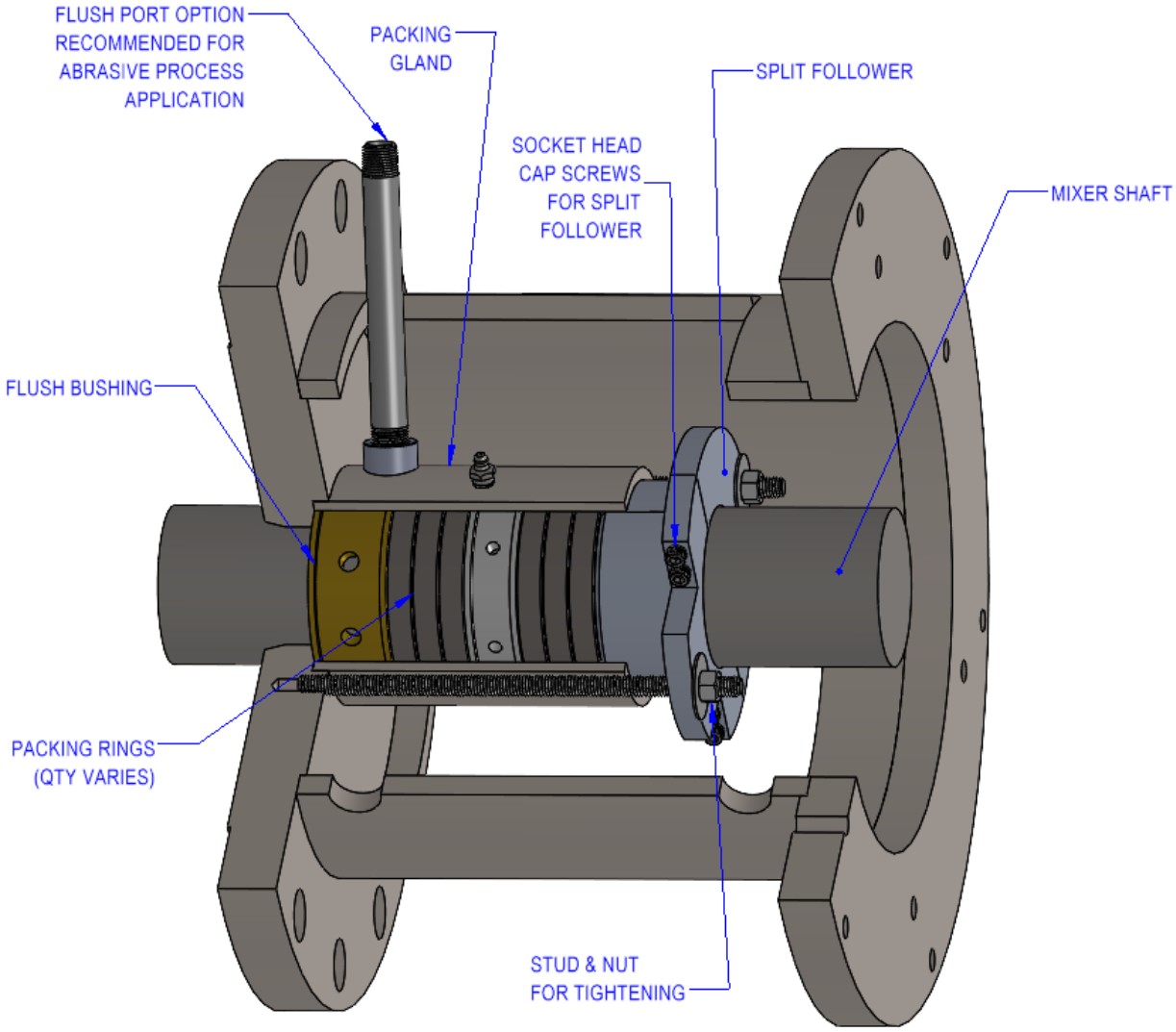


Installation – Top

If your mixer is mounted on the top of your tank (above liquid level), then most leakage will be vapor. Tighten nuts on the split follower down on packing to the point where there is resistance. **DO NOT OVER-TIGHTEN AS THIS WILL CAUSE DAMAGE TO THE SHAFT AND MAY CAUSE EXCESSIVE LOAD ON THE MOTOR.**

The high-pressure stuffing box will need to use process compatible grease for lubrication before starting your mixer. The high-pressure stuffing box will need to be lubricated periodically to insure proper lubrication. In a low-pressure stuffing box, the packing is lubricated during assembly at the factory. Stuffing box packing may need to be replaced to ensure proper lubrication. If tightening the split follower does not reduce the leak rate, the packing will need to be replaced.

High Pressure Stuffing Box / Side Entry with Flush Port – Figure 3



Installation – Side & Bottom

If your mixer is mounted on the side or bottom of your tank (below liquid level), then the leakage will be your product. Figure 2 shows the basic configuration of a high-pressure stuffing box that can & will be used in a side or bottom application. Depending on the tank contents the liquid can provide lubrication or abrasion. For abrasive contents, a secondary lubricating and process compatible liquid may need to be piped into a flush port as shown in Figure 3.

Allow Stuffing box to leak freely at start up – Side & Bottom

Excessive leakage during the first hour of start-up will greatly increase the life of the packing material in your stuffing box. After the first hour take up gradually on the gland by tightening the nuts on the threaded rods until leakage is reduced to a tolerable level. Below is table showing the shaft diameter to tolerable leakage rates:

SHAFT DIA - INCHES	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	6	6.5	7
LEAK RATE - DROPS PER MINUTE ± 1	7	9	11	14	16	18	23	27	32	36	41	45	54	59	63
PACKING SIZE - IN SQUARE	5/16	5/16	3/8	3/8	3/8	1/2	1/2	1/2	5/8	5/8	5/8	3/4	3/4	3/4	3/4

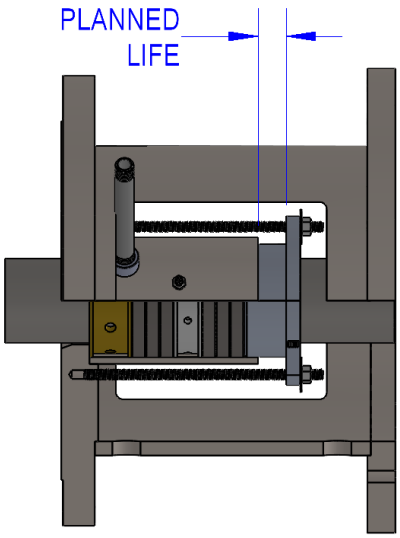
Typical packing materials:

- Graphite-Filled PTFE – Not Food Grade
- Mineral Oil-Lubricated PTFE – FDA Compliant Food Grade

Do not over-tighten gland nuts so there is no leakage as this will result in permanent scoring of the shaft. Periodically check leak rate and adjust with least force possible.

Maintenance

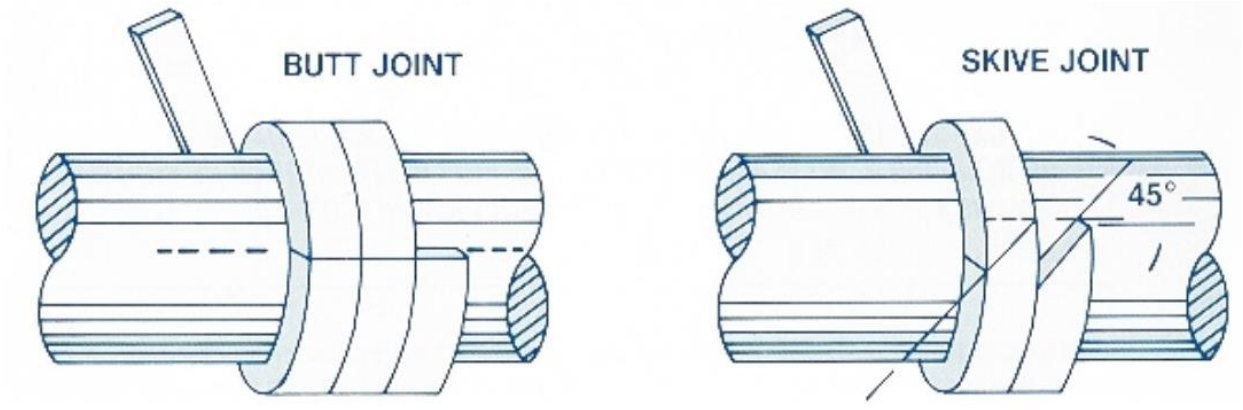
Maintenance on you stuffing box consists of routine lubrication and replacement of the packing material. If leakage cannot be controlled by tightening on the gland nut, it is time to replace the packing rings. Also, life of packing rings is done when there is no space between the split follower and the packing gland (Planned Life – see image below). **DO NOT ADD MORE PACKING RINGS TO TRY TO RESOLVE LEAKAGE – ALL OF THE PACKING RINGS MUST BE REPLACED.**



CAUTION: DISCONNECT POWER SOURCE & LOCK OUT/TAG OUT YOUR MIXER BEFORE SERVICING. PINCH POINTS & SHARP EDGES MAY BE LOCATED IN THIS AREA.

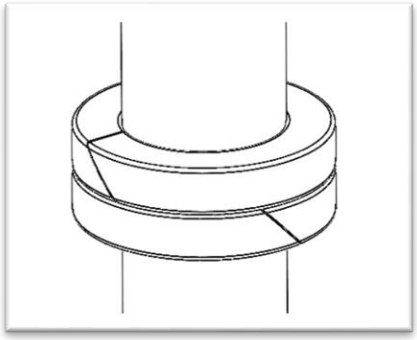
Packing Replacement Procedure

1) Maintenance should only be performed by qualified personnel.
2) Before performing any maintenance, always disconnect power to your mixer. Follow proper Lock Out-Tag Out (LOTO) procedures before proceeding.
3) Secure shaft & apply shaft shut-off (if equipped) before disassembly.
4) Remove gland nuts and washers.
5) Slide split follower toward mixer drive for access to the packing rings. Remove socket head cap screws to separate split follower for better access to packing material inside packing gland.
6) **Remove all old packing from packing gland. Keep track of the location & quantity of rings removed to know how many to replace.** Clean gland and shaft thoroughly.
7) **Examine shaft for wear and scoring. If your stuffing box has a lantern ring make sure there is no damage. Contact your Fusion Representative for a replacement shaft or lantern ring if needed.**
8) Make sure to use the correct packing ring stock (size and material) for your application.
9) If you are using coil packing material, always cut the packing into separate rings. **Never wind a coil of packing into a stuffing box.**
10) Rings can be cut with butt (square) or skive (diagonal) joints, depending on the method used for cutting (see image below). The best way to cut the packing rings is to cut them on a mandrel the same diameter as the mixer shaft.

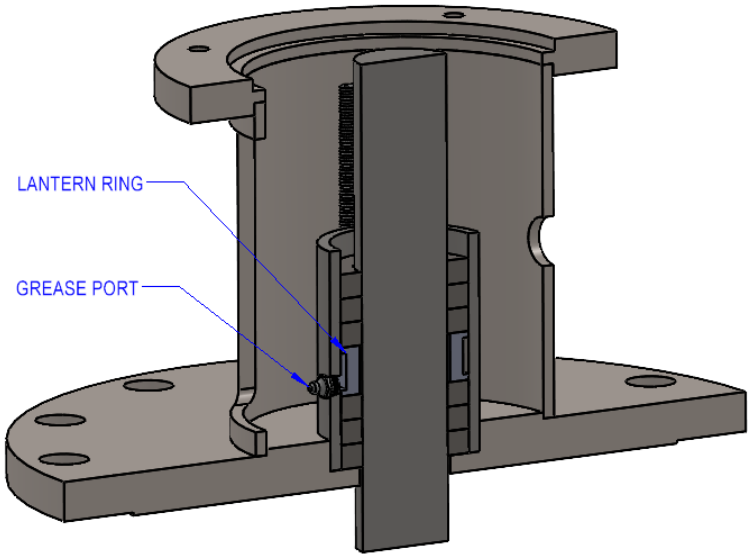


11) Once one ring is cut, make certain it fits the packing space properly. Each additional ring can then be cut in the same manner.

12) Install one ring at a time making sure that it is clean and has not picked up any dirt during handling. Apply required compatible lubrication. Seat rings firmly with a tamping tool if needed. We recommend that joints of successive rings should be staggered and kept 90 degrees apart as shown below.



13) Be sure to install the same amount of packing rings that were removed in the previous step before lantern ring is installed. Make sure the lantern ring is installed slightly above grease port (see image below) so that it will move under the inlet as pressure is applied to the split packing gland.



14) Once all the packing rings & lantern ring (if equipped) are installed, replace split follower (if removed) and move follower over threaded studs. Install washers (if present) and nuts on threaded rods, then finger tighten just until resistance is felt.
15) Apply lubrication to packing through grease port until seen coming out the end(s) of the gland.
16) Start your mixer. Once again, allow stuffing box to leak freely as described on page 4 for side & bottom applications. **Gradually tighten nuts on follower until leakage is reduced to an acceptable level (see table on page 4).**