
FlexMET™ Installation Instructions

***** Please read all instructions and notes at the end of the section prior to beginning installation. *****

To begin seal installation, check the contact area on the rotary shell where the wear pads will ride. Make sure this area has been cleaned and the surface is free of rough abrasive scratches, weld beads and spatter, coarse mill scale, or product build-up. The carbon wear pads are designed to deliver a self, dry lubricating film that will adhere to the rotary shell during operation. (Note: Do not apply any form of lubricant to the contact surface as it will attract abrasive particles.)

- 1) Create a seal module by placing a bolt through a hole in the wear pad, and up through the center (round) hole in the flap. Use a washer and full nut to fasten the wear pad and metal flap together. **Snug the nut only, do not over tighten as this will rupture the wear pad.**
- 2) Once snug, run a jam nut down to the full nut and tighten the two together. If desired, a thread locker can also be used here to insure that the nuts do not back off during operation. The other hole in the wear pad will line up with the other leading “round” hole of the metal flap. This hole will be fastened later when the flaps are overlapped and connected.
- 3) Affix this first assembled seal module in the 12 O’clock position on the mounting ring. The wear pad should be resting flat on the sealing surface of the drum.
- 4) Repeat step 1 to assemble a second seal module. This module will be affixed to the kiln overlapping the first module. The direction of the overlap will be dictated by the rotational direction of the kiln shell. (See notes at the end of the section)
- 5) Bolt the two mounted modules together by slipping a ferrule over a bolt and placing the bolt and ferrule up through the second hole of the wear pad. **Make sure the overlapped joint is between adjacent pads and not in the middle of a pad.** The bolt and ferrule will pass through the remaining round hole of the corresponding flap, and up through the slotted hole of the overlapping flap. Make sure the ferrule remains bottomed out on the bolt head. Use a washer and eyelet on this bolt to connect the flaps (The ferrules are only used at this connection point to protect the bolts from shearing as the flaps slip past each other in response to kiln movement). Run the eyelet down until it snugs up. Back the eyelet off up to ½ of a turn so that it is perpendicular to the leading edge of the flap. Make sure that the ferrule has free movement and is not trapped in place by the eyelet. Check to see if the plate flaps can freely slip over each other. This movement will be necessary as the seal reacts to axial movement of the shell.
- 6) Trap the clamping edge of the plate flaps with the clamping segments of the mounting ring as you work your way around the shell. The clamping segments should be finger tight to start and then fully tightened after the entire seal is installed.
- 7) Repeat the process of assembling and installing the modules. The final module will tuck under the first installed module to complete the seal.

***** If the BAIRICADE cover was purchased with this seal, go to instruction 1C below. Complete steps 8-11 after installing the cover. If just the seal was purchased, continue to step 8 to finish the installation. *****

- 8) Lace the tension cable through the eyelets and assemble the loop ends on the cables using the thimbles and clamps. If the eyelets are sideways and snug during lacing, loosen them slightly so they line up to allow the cable to easily pass through them (**Do not over tighten the eyelets to get them to line up as you may rupture the wear pad**). Attach the tensioner with springs to the loop ends of the cable. Once in place, the eyelets that are touching the springs or tension binder can be removed and replaced with the extra hex and jam nuts supplied. This will allow the binder and springs to

have a relaxed inline configuration with the cable. Otherwise, simply turn the eyelets parallel with the cable and allow the springs and binder to pass alongside the eyelets.

- 9) Latch the chain binder to add tension to the assembly and wire the tensioner shut using simple mechanics wire. Only enough tension should be used to insure that the seal completely contacts the kiln shell 360 degrees. If the seal does not snug up to the shell after latching, unlatch and readjust the loop ends of the cable to take up slack and re-latch until contact is made.
- 10) Make sure the clamping segments have been fully tightened prior to rotating the shell.
- 11) **Rotate the shell to test seal fit. If any areas of the seal are not sliding to adjust to the kiln movement, loosen the ferrule joints by ½ turn until proper sliding action is evident.**

NOTES ON INSTALLATION:

Plates: The plates are preformed according to the rotational direction of the kiln shell. They will be concave and pointing in the direction of rotation. Subsequently, installation should take place in this direction. The plates in this configuration will operate longer with lower generated system stress. The plates may be hand bent to ensure that the wear pads are contacting the shell surface flatly and not on edge. If eccentricity in the sealing surface is severe enough, the pads may ride on edge in these locations. This is normal and the pad will wear a smooth surface to insure proper sealing over time.

Wear Pads: A slight gap between the carbon wear pads has been factored to allow the plates to adjust to the eccentricity of the kiln shell, as well as to move in towards the rotary shell as wear occurs. The pads are pre-formed with a concave face that contacts the shell. This face also has hexagonal bolt holes that will hold the bolts in place while the eyelets and nuts are tightened. Do not over tighten the bolts as the wear pads may rupture around the bolt holes. Wear pads should be replaced when the heads of the bolts are flush with the wear pad.

Hardware Kits: The hardware kits consist of the following: 2 bolts, 2 washers, 1 ferrule, 1 full nut, 1 jam nut, and one eyelet. One hardware kit is required to complete one module.

Tension Cable: The springs on the tensioning cable assembly should only be minimally stretched. If thermal expansion is expected to be ½" or greater, a slight gap at the bottom of the seal (approx 1/8 inch) is sometimes desirable since this will account for kiln shell expansion during start-up.

Module Assembly: Several modules may be preassembled prior to installation onto the mounting ring. Once several modules are linked together, they can be lifted and slid over the studs in the mounting ring.

FlexMET™ Mounting Ring Installation Instructions

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FlexMET seals are manufactured in four different sizes depending upon kiln size and amount of kiln shell ovality. Each seal requires a different mounting ring depending upon the size of the seal:

Installing the Annular Mounting Ring

Sutton Industrial Products LLC (SIP) will design the mounting ring that fits the seal for the application. This includes bolt circle spacing, number of mounting studs, and diameters of flat mounting flanges. The mounting ring can be fabricated by the customer however SIP cannot guarantee seal fit in this instance. **LOCATING THE MOUNTING RING ON THE HOOD OR DUST CHAMBER IS THE MOST IMPOTRANT STEP IN SEAL INSTALLATION.** Having the mounting ring centered to the rotational axis of the kiln greatly affects seal life and performance.

Most kiln shells have a certain amount of ovality or run-out, which may be greater when shut down and cold. Thus, if the seal mounting ring is located by reference to a cold, stationary kiln, the seal may end up not concentrically mounted with the “dynamic” centerline of the hot, rotating kiln. To obtain the optimum placement for the mounting ring, the following procedure is recommended:

When the kiln is operating at normal temperature, mark the “high” and “low” points on the rotating shell with chalk.

A proven method of obtaining runout dimensions is to place a steady rest near the sealing surface of the kiln shell during normal operation. Measure the distance from the steady rest to the sealing surface at various points of rotation to get a representation of how out of round the sealing surface is. Mark each point of measure with a number and draw a sketch of the surface. This will allow you to determine a mounting point based on various measurements around the shell to get a good centering of the ring.

This provides for an even amount of wear 360° around the seal and will maximize seal life and performance. **The mounting ring is supplied in segments and the segments are oftentimes not identical.** Locate the match marks scribed into the ends of the ring segments and pair together. Lay out the ring on the ground to insure a concentric circle with equal bolt spacing between the segments. The mounting ring is then either welded or bolted onto the hood. If welded, locate the ring within the mounting tolerance of centerline (1/8” for mini seals, 3/16” for mid-size seals, 1/4” for standard size seals). Once in position, tack the ring segments onto the equipment until the full ring is in place. Measure the ID of the ring down to the sealing surface points of reference to make sure that the ring is properly aligned.

The conical section and flat flange section of the mounting ring are normally fabricated with just a tack weld to avoid warping individual segments. Once the dimensions are verified, the OD of the mounting ring can be fully welded to the static hood, and the split line between the flat and conical sections of the mounting rings can be fully welded together as well. After the mounting ring is in place, seal installation may begin.

BAIRICADE Cover Installation Instructions

If you have purchased the optional BAIRICADE cover with your seal, congratulations! The BAIRICADE seal cover provides an excellent additional vapor barrier to the FlexMET seal which gives you the durability of a metal type seal with the efficiency of a fabric type seal. Installation instructions are as follows for the BAIRICADE cover and are completed after installation of the FlexMET modules:

- 1C) Fold the cover in half and mark the midpoint with a marker. Sling the cover over the shell such that the cover hangs evenly over both sides of the drum. The marked midpoint should be in the 12 o’clock position. This will allow the cover to overlap at the exact bottom of the shell to facilitate possible cleanout.
- 2C) Starting at the top, position the cover such that the inside edge of the sealing lip is flush against the wear pads and front edge of the FlexMET seal. Loosen 3 or 4 clamping segments and stretch the cover over the overlapping seal leaves and over the mounting studs. Locate the eye nuts under the cover and cut a small slit into the cover just large enough to allow the eye nut to pass through the slit. This will allow the cover to rest flatly on the overlapping seal leaves.
- 3C) Next, locate the mounting studs under the cover and cut slits in from the outside edge of the cover down to where the mounting stud is located. Make sure to only cut the slit deep enough to fit over the mounting studs. This will “relax” the cover on the mounting ring as well as relieve any “pucker” on the shell surface. The outside edge of the cover does not have to be even with the clamping ring OD. It is ok if the cover sticks out from the clamping ring segments a little bit.

*** Note on steps 2 and 3: make sure you tug on the seal to stretch it out along the sealing surface. This will avoid any extra material being in place and causing the sealing lip to sag or become puckered. The sealing lip should not wave in and out but rather be as straight of a line as possible.
- 4C) After several slits are cut and the cover is positioned into place, reinstall the clamping ring segments and tighten the bolts (about 40 FtLbs if using a torque wrench).
- 5C) Work your way down the sides evenly removing clamping segments, stretching the cover, cutting slits and positioning the cover into place. As sufficient slits are made, continue clamping the cover in place with the clamping ring segments. As you progress toward the bottom, make sure there is **not** severe cover sag between the cover lip and the shell (This may cause the cover to pucker once the tensioner is installed). When the bottom is reached, the cover should overlap itself.

- 6C) Lace the Kevlar tension strap through the belt loops in the cover. The straps should be positioned such that there will be a spring joint at the bottom where the cover overlap is located. Once the straps are laced, install the belt buckles onto the ends of the straps.
- 7C) Once the buckles are in place, affix a tension spring between each buckle. Check for sag at the bottom of the cover. Pull the tension strapping just tight enough to ensure contact is made between the sealing surface and the sealing lip of the cover.
- 8C) Install the FlexMET cable tensioning device per the instructions 8-11 above.