

# Sanitary Element Installation Procedures

## Outerwrap “Without Tail”

Spiral elements must fit snugly in their vessels in order for them to function properly. If a loose-fitting element is put into operation, one of two unfavorable consequences may result:

- a) Too much liquid will by-pass the element, going around rather than through it. This can result in lower fluxes, more rapid membrane fouling, lower permeate flow, longer cleaning times, and increased costs of cleaning chemicals.
- b) A loose-fitting spiral element may lose some physical integrity by expanding to fit the housing. This can result in buckling, wrinkling, and/or “channeling” which may cause a premature leakage of the membrane.

A preservative solution is used to prevent microbial growth and membrane dry-out during shipping and storage. While this solution is not classified as hazardous, extra care should be taken to limit exposure. The elements should undergo a standard cleaning (CIP) procedure prior to start up to ensure that preservative has been fully rinsed, and that final rinse water is at a neutral pH.

Recommended Equipment: Sharp knife or scissors, gloves, safety glasses, and dust mask.

## Installation Procedures

1. Remove the element from the plastic bag and take this opportunity to do a thorough visual examination of the element. There should be no mold, dust, or dirt anywhere on the element. If preservative fumes are uncomfortable for some, allow bags to air out for 30-60 minutes after opening.
2. Prepare an element loading diagram to document the serial number(s), date, element model number, location within the system, and any other required information for future reference.
3. Attempt to install the element into the pressure vessel. It should fit snugly. Be sure to examine Anti-Telescoping Devices (ATD's) and lip seals and replace if needed.
4. Lip seals should be well lubricated prior to installation with a non-petroleum based lubricant such as glycerine or any mild household liquid detergent. Inserting the ATD with lip seals should be done with a slow twisting motion to ensure a good seat and to prevent leakage.
5. A sufficient flush should be performed on all elements prior to start-up. Clean water at 122°F (50°C) should be used in a non-recirculating mode for at least 10 minutes after installation. This should remove all preservative solutions, glycerine, etc. and will help ensure successful membrane performance. The element should be at a neutral pH and thoroughly flushed prior to start-up. Additionally, a caustic wash is recommended as well prior to start-up. For UF/MF a 30min rinse and 120-125°F (49-52°C) is sufficient, while NF is recommended to have two caustic washes (15min each) at 115-118°F (46-48°C) with clean water rinses in between. The element should be at a neutral pH and thoroughly flushed prior to start-up. See specsheets for pH range limitations.
6. The element is now ready for start-up. Feed and/or recirculation pumps should “ramp-up” RPM's slowly to prevent the element from being shocked. Variable Frequency Drives (VFD's) are recommended for all feed and recirculation pumps to safely control pump RPM's.
7. Synder Filtration requires the collection of daily performance data of the system and element performance. The following data should be collected at least daily, and is required in the event of a warranty claim:
  - a) Flows (feed, permeate, concentrate)
  - b) Pressures (feed, permeate, concentrate)
  - c) Operating temperatures (production and CIP)
  - d) Hours of operation (production and CIP)
  - e) Other cleaning parameters (pH, time, chlorine exposure)
  - f) Unexpected events (system upsets, unscheduled shutdowns, etc.)

## Outerwrap “With Tail”

To further improve the fit of the element in the vessel, Synder Filtration offers a “trim-to-fit” outerwrap. The inner diameter can sometimes vary between vessels and this allows for a customized fit for each vessel.

A preservative solution is used to prevent microbial growth and membrane dry-out during shipping and storage. While this solution is not classified as hazardous, extra care should be taken to limit exposure.

Recommended Equipment: Sharp knife or scissors, gloves, safety glasses, and dust mask.

## Installation Procedures

1. Remove the element from the plastic bag and take this opportunity to do a thorough visual examination of the element. There should be no mold, dust, or dirt anywhere on the element. If preservative fumes are uncomfortable for some, allow bags to air out for 30-60 minutes after opening. Remove the tape strips from the element.
2. Prepare an element loading diagram to document the serial number(s), date, element model number, location within the system, and any other required information for future reference.
3. Attempt to install the element into the pressure vessel.
4. If the element does not fit snugly, trim off the tail from the element at approximately 1/4 of the Outer Diameter (OD) at a time. Test the element’s fit after each trimming. Ideally, the element should fit snugly into the vessel.
5. Examine Anti-Telescoping Devices (ATD’s) and lip seals and replace if needed.
6. Lip seals should be well lubricated prior to installation with a non-petroleum based lubricant such as glycerine or any mild household liquid detergent. Inserting the ATD with lip seals should be done with a slow twisting motion to ensure a good seat and to prevent leakage.
7. A sufficient flush should be performed on all elements prior to start-up. Clean water at 122°F (50°C) should be used in a non-recirculating mode for at least 10 minutes after installation. This should remove all preservative solutions, glycerine, etc. and will help ensure successful membrane performance. The element should be at a neutral pH and thoroughly flushed prior to start-up. Additionally, a caustic wash is recommended as well prior to start-up. For UF/MF a 30min rinse and 120-125°F (49-52°C) is sufficient, while NF is recommended to have two caustic washes (15min each) at 115-118°F (46-48°C) with clean water rinses in between. The element should be at a neutral pH and thoroughly flushed prior to start-up. See specsheets for pH range limitations.
8. The element is now ready for start-up. Feed and/or recirculation pumps should “ramp-up” RPMs slowly to prevent the element from being shocked. Variable Frequency Drives (VFD’s) are recommended for all feed and recirculation pumps to safely control pump RPMs.
9. Synder Filtration requires the collection of daily performance data of the system and element performance. The following data should be collected at least daily, and is required in the event of a warranty claim:
  - a) Flows (feed, permeate, concentrate)
  - b) Pressures (feed, permeate, concentrate)
  - c) Operating temperatures (production and CIP)
  - d) Hours of operation (production and CIP)
  - e) Other cleaning parameters (pH, time, chlorine exposure)
  - f) Unexpected events (system upsets, unscheduled shutdowns, etc.)