



## Preventive Maintenance Checklist

### PLATE HEAT EXCHANGERS

Implementation of a preventive maintenance plan keeps SPX FLOW products running at optimal levels and protects your product investment. Use the below checklist to schedule regular product inspections and part replacements using SPX FLOW genuine spares to extend your products lifecycle.

	MAINTENANCE FREQUENCY*					POSSIBLE CAUSES	POSSIBLE SOLUTIONS	SOLVE WITH 
	DAILY (150 HRS)	WEEKLY (150-300 HRS)	MONTHLY (300-500 HRS)	EVERY 3 MONTHS (500-1000 HRS)	EVERY 6 MONTHS (3,000 HRS)			
<b>GASKETS</b>		X				<ul style="list-style-type: none"> <li>Elastomer degradation happens overtime, can be normal or caused by the product or excessive heat.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the elastomer material with Genuine SPX FLOW gaskets to withstand chemical attack or excessive processing temperatures.</li> </ul>	
		X				<ul style="list-style-type: none"> <li>Leaking at low temps or at startup.</li> <li>Fingernail test the gasket- press thumbnail into gasket to make an impression. If impression stays in the gasket, it needs to be replaced. If it goes away, the gasket has enough elasticity for continued use.</li> </ul>	<ul style="list-style-type: none"> <li>Elastomers used at relatively high temperatures tend to harden and their sealing performance at low temperatures will deteriorate. Because of this, it is essential to avoid cold start-ups at high pressures.</li> <li>Replace gasket material with Genuine SPX FLOW gaskets.</li> </ul>	
				X		<ul style="list-style-type: none"> <li>Pressure and temperature spikes can cause sealing gaskets to expand or contract.</li> </ul>	<ul style="list-style-type: none"> <li>Pressure must change slowly in plate heat exchangers, as plates breathe during pressure changes and may cause movement or flexing.</li> <li>Shock cooling may cause sudden contraction of sealing gaskets.</li> </ul>	
				X		<ul style="list-style-type: none"> <li>Gasket materials can dry out and become brittle is exposed to certain environments.</li> </ul>	<ul style="list-style-type: none"> <li>It is recommended to store gaskets in a black or opaque plastic bag, sealed to prevent the ingress of air, moisture, contaminants and UV radiation.</li> <li>Store away from sunlight and ozone producing equipment such as welders and electric motors.</li> </ul>	
						<ul style="list-style-type: none"> <li>Nitrile: 3 years, EPDM: 5 years</li> </ul>		
<b>PLATES</b>		X				<ul style="list-style-type: none"> <li>Leaks can be caused by Improper gasket installation, not enough plate tightening, or normal gasket degradation.</li> </ul>	<ul style="list-style-type: none"> <li>Reinstall gaskets into plate gasket grooves.</li> <li>Tighten plate pack one turn.</li> <li>Do not over-tighten, as over-tightening can cause plate damage. Replace gaskets.</li> </ul>	
					X	<ul style="list-style-type: none"> <li>Use approved testing procedures to regularly test the integrity of the heat transfer plates.</li> <li>SPX FLOW can provide approved testing processes.</li> <li>Working fluids can cause gaskets swelling, and plate deformation, which in turn can cause leaking.</li> </ul>	<ul style="list-style-type: none"> <li>Replace plates immediately if leaking is detected.</li> <li>Under normal operation and process material, the average life of a plate is expected to be 7-8 years.</li> </ul>	
						<ul style="list-style-type: none"> <li>Normal usage: 7-8 years</li> </ul>		
					X	<ul style="list-style-type: none"> <li>Over time due to constant force or corrosion, the Head can bow.</li> </ul>	<ul style="list-style-type: none"> <li>Check the Head for flatness. If there is deflection, replacement is recommended.</li> <li>Over time, deflection can increase the probability of the plate pack not sealing.</li> </ul>	
<b>MOVING PARTS</b>					X	<ul style="list-style-type: none"> <li>Over time due to constant force or corrosion, the Head can bow.</li> </ul>	<ul style="list-style-type: none"> <li>Check the Follower for flatness. If there is deflection, replacement is recommended.</li> <li>Over time, deflection can increase the probability of the plate pack not sealing.</li> </ul>	
				X		<ul style="list-style-type: none"> <li>Tie bars are heavily loaded and need to be regularly lubricated.</li> </ul>	<ul style="list-style-type: none"> <li>Lubricate tie bars with Never-Seez to maintain free movement.</li> </ul>	
					X	<ul style="list-style-type: none"> <li>Unless otherwise specified, the nozzle loads on industrial units are designed to meet API specifications. If there are consistent loads present that exceed these specs, they can force the frame out of alignment which can cause leaks, damage plates and/or frame components.</li> </ul>	<ul style="list-style-type: none"> <li>If excessive piping loads are found, action must be taken by owner to reduce these loads or risk potential catastrophic damage to the heat exchanger.</li> <li>SPX FLOW Engineering can confirm the nozzle loading specifications for each APV heat exchanger.</li> </ul>	
					X	<ul style="list-style-type: none"> <li>The plates are hung on and supported by the Top Bar. It is critical the Top Bar is straight and not warped. If there is warping or deflection, the potential for the plate pack to not consistently seal is significantly increased. A warped Top Bar can also cause misalignment of the plate pack which may damage the plates.</li> </ul>	<ul style="list-style-type: none"> <li>If a warped tie bar is found, it should to be replaced as soon as possible.</li> </ul>	

\*Maintenance frequency is dependent on production hours, product/process conditions, and required regulatory inspection approvals. For more detailed repair information, download a copy of the required plate heat exchanger manual from the SPX FLOW website. Contact your local distributor for repair service and genuine SPX FLOW parts orders.

## ADDITIONAL TECHNICAL INFORMATION

### Gaskets:

- Gasket life
  - » The life of a gasket principally depends on operating temperatures, temperature variations and chemical influences.
  - » An increase in the temperature by 50°F (10°C) can reduce the life of the gasket by 50% and a reduction of the temperature by 50°F (10°C) can increase the life of the gasket by 50%.
- Sealing performance of aging gaskets:
  - » Since all gasket elastomers suffer from compression set with age and temperature, aging gaskets will eventually fail to properly seal.
  - » Elastomers used at relatively high temperatures tend to harden and their sealing performance at low temperatures will deteriorate. Because of this, it is essential to avoid cold start-ups at high pressures.
- Swelling of gaskets:
  - » Although, APV plates and gaskets are designed to withstand maximum design pressures and temperatures, certain working fluids or trace constituents of these fluids can attack the gaskets and cause severe swelling.
  - » Swelling may cause plate deformation.

### Plate Life:

#### The life expectancy of APV plates is subject to many factors, including:

- The process duty the plate is performing
- Cleaning agents used in the cleaning process
- Design and operation of the overall system
- Operating outside the parameters stipulated by SPX FLOW/APV
- Use of oxidizing chemicals and other corrosive material
- Failure to properly maintain and monitor the condition of the plates

*We believe with proper process system design, appropriate use and proper maintenance within the recommended plate compressed dimension, the estimated life of a plate could be 7-8 years. Plate pack integrity needs to be checked against a regular PM schedule. Plates that have pin holes, cracks, excessive fouling or scaling must be replaced immediately.*

### Frames:

- Tie bars are highly loaded. Grease the top bar and lubricate the tie bars with Never-Seez.
- Do not allow load on connections, especially on grids which have no strength to take pipe loads.

### Shutdown:

- All liquids should be drained from the heat exchanger after shut down to prevent precipitation of products or scale build-up.
- In the case of corrosive fluids, it may also be necessary to flush with clean, non-corrosive water.

### Pressure and Temperature Spikes:

- Pressure must change slowly in plate heat exchangers.
- Multi-section units breathe like a concertina during pressure spikes which cause leakage and plates or gaskets.
- Pressure changes may cause movement and/or flexing of the plate pack.
- Sudden changes in the operating pressure and temperatures should be avoided.
- Shock cooling of the heat exchanger may cause leakages due to sudden contraction of the sealing gaskets.

## LOCATE YOUR LOCAL DISTRIBUTOR FOR CERTIFIED SERVICE AND GENUINE SPARE PARTS.



#### SCAN FOR LOCATOR



#### NAVIGATE TO LOCATOR

1. Go to [www.spxflow.com](http://www.spxflow.com)
2. Select **Brands** on Navigation
3. Locate **Where to Buy** Button

WHERE TO BUY

#### Testing available from SPX FLOW:

- One testing process available is the Testex system. Testex consists of the detection of defective plates in the plate heat exchanger through Electrolytic Differential Analysis (EDA).
- EDA is used to determine if cross contamination is present. A consistent rise in the conductivity of the water indicates the presence of defective plates.

#### Testex features:

- The Testex range can pick up even the smallest of cracks
- Testing is carried out under pressure
- Utilizes state-of-the-art monitoring equipment
- Identifies the occurrence of cross contamination without the PHE being dismantled
- Adaptable to many models and sizes of PHE's
- Testing is completed without opening the plate pack

Based in Charlotte, North Carolina, SPX FLOW, Inc. (NYSE: FLOW) is a multi-industry manufacturing leader. For more information, please visit [www.spxflow.com](http://www.spxflow.com)

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