The gasket study was done for FlowSmart. It was a blind study that revealed very definitive and consistent details. The criteria of the tests were as follows:

- **Material Appearance**
- **Extrusion**
- **Stickiness: 1-5**

1. No stickiness, gasket falls off
2. Slight stickiness, just pushing on the edge pops the gasket loose
3. Moderate stickiness, gasket has to be peeled off but is not uniformly fixed across fitting face
4. Heavy stickiness, gasket holds both fittings together and has to be pried off with fitting and then peeled off of second face and is uniformly fixed to face
5. Extreme stickiness, removal requires using a screwdriver to start removal
6. Extreme stickiness, material left adhered to fitting after gasket is removed

### Test Summary:

Here is what we learned from the study:

1. The two best performers were FlowSmart and Competitor X. The X product intruded more than the FlowSmart product very consistently. Their maximum intrusion was .060, FlowSmart’s was .040. Typically FlowSmart’s intrusion was 0 or .025, where the X product had at least .030 on one side of each gasket.

2. Neither FlowSmart’s products nor X company left gasket material attached to the ferrules. This is the closest to a “nonstick” EPDM. The Y and Z gaskets left gaskets on the ferrule faces and had to be scraped off.

3. The photo’s tell the story in how badly the Y and Z products performs.

### Conclusion

This study redefines gasket performance analysis as we learned how to better understand what should be considered a gasket “failure”. While a leak is a clear failure, gasket damming that causes entrapment is the true critical fail point. Since that is now known this study proves that no critical process has to exist with those conditions. FlowSmart has sold hundreds of thousands of high purity EPDM gaskets. The information here proves that we will keep your system performing better and longer without charging higher costs for our products than what the industry is accustomed to.

**Finished Gasket Quality**

Frayed edges, excessive flash and poor surface finishes were commonly found when evaluating the Y and Z brands. FlowSmart’s high quality standards combined with our thorough QC program ensures that a quality product is delivered consistently and accurately. FlowSmart is a ISO 9001:2008 company.
Critical Study

Understanding EPDM Gasket Performance

The EPDM Gasket study shown here is an assessment of data taken from an in-line Steam study, which is supported by Extraction data. We find it to be more revealing than ever because we are interpreting the data according to what is critical to your process. In the past the only performance data evaluated was “how many cycles were run before leaking occurred”. Our third party evaluation proved that a system is compromised long before leaks were revealed.

Our studies prove that your gaskets don’t fail upon leaking; they fail when your gasket leaches its critical components, thereby losing dimensional stability and becoming susceptible to deformation and extruding into the process stream. Cleanability is compromised and the process becomes vulnerable to trapping bacteria.

Performance Example

FlowSmart
Gasket is completely intact, no gasket particulates left on Ferrule faces.
Looks New!

Competitor Y
Gaskets peeled and gasket particulate was left attached to Ferrule faces.
Intrusion is excessive. Flashing was present when still new.

Competitor X
Gaskets still looked new
Intrusion is minor.

Competitor Z
Gaskets peeled and gasket particulate was left attached to Ferrule faces.
Intrusion is excessive. Flashing was present when still new.

What you should know about “Stick”......

Stickiness is often discussed with EPDM gaskets. An independent study proved that all four brands did stick to the ferrule after a number of steam cycles.

So is stick an area of concern? Yes but only when the gasket cannot be removed from the ferrule. The engineer who ran our study commented that brands Y and Z peeled and then broke apart with some material separating into the operator’s hands and the other material remaining attached to the ferrule. While the FlowSmart gaskets and the European brand also stuck, both gaskets remained intact upon removal from the ferrule faces. This provides the operator a clean start with the new replacement gasket and ensuring that no gasket particles find their way into the process stream. FlowSmart’s EPDM and the newer European brand both accomplish the important condition of clean, intact removal that has been a constant mode of failure for many years. Their higher costs doesn’t equal higher value! FlowSmart provides this value while our European competitor does not.

In the first 7 hours gaskets extract the greatest amount of their componentry, which is consistent here. FlowSmart’s competitor’s extracted 10 times more of their composition in water and 5 times or more in Hexane. This is evidence of the gasket structure already beginning to fail thus contributing to the extrusion into the pipeline and susceptibility to decomposition.

FDA Extraction Test

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This condition is shown with the following test parameters:
• Steam temperature: 130 - 135 C (266° - 275° F)
• Exposure time: 117 hours constant steam
• Clamps tightened to 25 in/lb with torque wrench at start of test and not re-tightened during testing.

Average Maximum Intrusion per Gasket in Inches

Gasket Stick Analysis

Gasket Rating Factor (Intrusion x Stick) Lowest number is best performer

Two critical gasket factors graphed to display the total performance value of the EPDM gaskets.
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**Performance Example**

**Gasket Intact**
- FlowSmart: Gasket is completely intact, no gasket particulates left on Ferrule faces. Looks New!
- Competitor Y: Gaskets peeled and gasket particulate was left attached to Ferrule faces. Intrusion is excessive. Flashing was present when still new.

**Minor Intrusion**
- Competitor X: Gaskets still looked new. Intrusion is minor.
- Competitor Z: Gaskets peeled and gasket particulate was left attached to Ferrule faces. Intrusion is excessive. Flashing was present when still new.

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**Gasket Stick Analysis**

FlowSmart Gaskets exhibited minimal intrusion.

Based on 1 to 6 rating (see notes*)
FlowSmart and European brand adhered but released intact while the other brands left gasket material on ferrule faces.

**Average Maximum Intrusion per Gasket in Inches**

<table>
<thead>
<tr>
<th>Gasket</th>
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</tr>
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<tbody>
<tr>
<td>FlowSmart</td>
<td>0.017</td>
</tr>
<tr>
<td>Brand X</td>
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</tr>
<tr>
<td>Brand Y</td>
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**Gasket Stick Factor (Intrusion x Stick) Lowest number is best performer**

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</tr>
<tr>
<td>Brand Y</td>
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</tr>
<tr>
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<td>0.685</td>
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</tbody>
</table>

Two critical gasket factors graphed to display the total performance value of the EPDM gaskets.

*Notes:
- *FlowSmart Gaskets* exhibited minimal intrusion.
- *Gasket Stick Factor* reflects the combined intrusion and stickiness.
Gasket Stick Analysis

Two critical gasket factors graphed to display the total performance value of the EPMD gaskets.

FlowSmart and European brand adhered but released intact while the other brands left gasket material on ferrule faces. Based on 1 to 6 rating (see notes*):

- **FlowSmart**: 0.060
- **FlowSmart**: 3.5
- **Brand X**: 0.154
- **Brand Y**: 0.392
- **Brand Z**: 0.685

0.70
0.60
0.80
0.40
0.30
0.20
0.10
0

Average Maximum Intrusion per Gaskey in Inches

FlowSmart Gaskets exhibited minimal intrusion.

- **FlowSmart**: 0.017
- **Brand X**: 0.044
- **Brand Y**: 0.072
- **Brand Z**: 0.137

0.150
0.120
0.090
0.060
0.030
0

Gasket Rating Factor (Intrusion X Stick)

Lowest number is best performer

### Conclusion

**Test Summary:**

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