Technical bulletin – EN 13555 tests: $Q_{\text{min}}(L)$ and $Q_{\text{Smin}}(L)$
(Minimum gasket stress during installation and in operation)

Product: GORE® GR sheet gasketing
Test dates: November 2005 – January 2006
Test institute: Fachhochschule Münster
Test procedures: Leakage test according to EN 13555

TEST OVERVIEW:
$Q_{\text{min}}(L)$ is the minimum required gasket stress for a certain leakage class L when the seal is first installed. For example, $L_{0.1}$ corresponds to a leakage of 0.1 mg/(s*m).
$Q_{\text{Smin}}(L)$ is the minimum required gasket stress in operation for a certain leakage class L and primarily depends on the initial gasket stress $Q_A$. The higher this value, the lower the $Q_{\text{Smin}}(L)$. $Q_{\text{Smin}}(L)$ is always lower than $Q_{\text{min}}(L)$.

Note: The tests specified in EN 13555 only provide for the measurement of values of 10 MPa and higher. However, other tests and practical experience have shown that a gasket stress of 5 MPa is sufficient to achieve both a tight seal and blow-out resistance. For this reason, Gore always specifies 5 MPa for $Q_{\text{Smin}}$, irrespective of the seal thickness and the initial gasket stress.

A load is applied to and removed from the seal in predefined increments, with the leakage being measured constantly. The internal pressure is usually 40 bar (test gas: helium).

Test results:

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness [mm]</th>
<th>$Q_{\text{min}}$ [MPa]</th>
<th>$Q_{\text{Smin}}$ [MPa]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GORE® GR</td>
<td>1.6</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>3.2</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>6.4</td>
<td>13</td>
<td>38</td>
</tr>
</tbody>
</table>

Key:
- $<10$: The leakage rate is not exceeded.
- X: The leakage rate is not achieved at $Q_A$ as part of the measuring program.

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