PERFORMANCE CHARACTERISTICS OF VENTS
Selection Guide

Purpose of Venting
The purpose of venting a package can be:
- To relieve overpressure caused by gassing of the filling product (e.g., hydrogen peroxide)
- To relieve under pressure caused by cooling down of a drum after hot filling (e.g., high viscosity liquids)
- To prevent unsafe stacking conditions of light weight packages as a result of pressure changes caused by temperature variations.

Compatibility
It remains the responsibility of the user to check if all requirements in the law and regulations are met (e.g., product filling, safety and transportation). Chemical compatibility testing should be conducted under laboratory and in actual use of the vent-closure system.

Range of Standard Vents
Valve Type Vents
The standard valve type vents are made of high-performance rubber. The functional operation of this type of vent is based on pre-tensioning of the stem of the vent and allowing re-closing after over- or under pressure has occurred. Rubber mushroom and umbrella vents are available for Tri-Sure® plastic and steel plugs in many executions.

Membrane Type Vents
The standard microporous membranes (MPV) type vent consists of a P.T.F.E. (Teflon) backing and is available in G¾ Tri-Sure plastic plug execution provided with a protective bulb. This in turn can be assembled into a Tri-Sure combination plug or a Tri-Sure vented Screwcap. For special applications insert type vents are also available. By nature, the membrane is liquid repellent and allow the container to breathe while preventing the ingress of moisture or foreign matter.

Performance
The performance of a vent system can only be guaranteed when located above the liquid surface and not affected by the contents of the drum or any other foreign material that can block the outlet vent opening. The performance of the standard vent is as indicated in the table above.

<table>
<thead>
<tr>
<th>Vent Type</th>
<th>Average Opening Pressure in Bar</th>
<th>Average Air Flow Rate in ml/min. at 0.2 Bar Pressure</th>
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<tbody>
<tr>
<td>Umbrella or Mushroom</td>
<td>0.1</td>
<td>1000</td>
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<tr>
<td>Microporous Membrane</td>
<td>(almost) 0</td>
<td>1500 minimum</td>
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</table>

Selection Guidelines
Step 1 Verify whether the relevant Regulation/Recommendations permit venting of the package in the specific intended application.
Step 2 Determine whether the requirement of venting is uni- or bi-directional. If bi-directional venting is not allowed, membrane type vents are not suitable.
Step 3 Check if venting is required below the threshold opening pressure of a valve type vent.
Step 4 Check the maximum temperature requirements. For hot-filling of highly viscous products, where venting-in during cooling down of the drum is required, a steel plug with a valve type vent is advised when the filling product is not sensitive to ingress of foreign material.
Step 5 Check the chemical compatibility (see para. 5) in combination with the required venting performance.

Cautionary notes!
- Only vented Tri-Sure® Tab-Seal® are allowed on vented closures.
- Always store upright.
- Store under cover.
- Air transport is not permitted.
- Check National Regulations for local requirements.

For details contact our local Tri-Sure® Sales & Support center.