Stoneridge, Inc., Control Devices Division
Canister Vent Solenoid Valves and Filters
used in Reduction of Evaporative Emissions

The Stoneridge Advantage:

Stoneridge, Inc. is a publicly traded company (NYSE: SRI) which offers highly engineered sensors and controls for applications in the global transportation Industry. SRI has manufacturing facilities located in North America, Europe, South America, India and China. The Control Devices Division of SRI with technical design centers located in Lexington, OH USA, Canton, MA USA and Suzhou, China has been designing and manufacturing sensors and controls for vehicle applications such as evaporative emissions for over 40 years.

Product Features/Benefits:

- Supports OBD (On-board Diagnostics) for Evaporative Emissions Control Systems
- Hose connection (ported) and Canister Integrated Valve styles
- Adaptable to different port directions & different port connection types to a common valve design
- Mounting location flexibility
  - Ported version can be mounted +/- 15 degrees vertical
  - Integrated version mounted horizontal and vertical
- Improved environmental resistance by reducing leak paths in design
- Quieter operation with integrated style
- Magnetic modeling (Ansoft) used in valve design
- Highly automated manufacturing

Canister Vent Solenoid Valve Operating Environment:

- Operating temperature: -40° to 90° C typical
- Compatible with standard fuels and blends of Methanol or Ethanol with iso-octane and iso-octane/toluene fuels
- Mounted to frame or underbody, customer specific
- Salt spray exposure to 960 hours
- Zinc and Calcium Chloride compatibility
Stoneridge is an independent designer and manufacturer of highly engineered electrical and electronic components, modules and systems principally for the automotive, light/medium/heavy-duty truck, agricultural and off-highway vehicle markets. Our products provide engineered solutions that improve the efficiency and performance of electric and electronic systems.

The Control Devices Group focuses on products that sense, switch and control a specific function. Our key technologies include:

- Electromechanical Actuators
- Customer Actuated Switches
- Emission Sensors
- Solenoid Coil Valves
- Powertrain Switches and Sensors
- Pressure Switches
- Speed Sensors
- Temperature Sensors
- Position Sensors
- Torque Sensors
Dust Filters for Canister Vent Valves
Functional Description and Design Features

Functional Description - Dust Filters:

<table>
<thead>
<tr>
<th>Filter Type</th>
<th>Filtration Method</th>
<th>Type</th>
<th>Size L x W x H (mm)</th>
<th>Dust Capacity</th>
<th>Efficiency ISO Course Dust</th>
<th>Water Capacity</th>
<th>Differential @ 70 Slpm flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5” Round</td>
<td>Centrifugal/Foam</td>
<td>Vent</td>
<td>65 x 84</td>
<td>70 gram</td>
<td>70% min.</td>
<td>100 ml</td>
<td>0.15 kPa</td>
</tr>
<tr>
<td>2.0” Round</td>
<td>Centrifugal</td>
<td>Inline</td>
<td>51 x 84</td>
<td>35 gram</td>
<td>70% min.</td>
<td>70 ml</td>
<td>0.18 kPa</td>
</tr>
<tr>
<td>Box</td>
<td>Foam</td>
<td>Vent</td>
<td>54 x 33 x 79</td>
<td>5 gram</td>
<td>---</td>
<td>0 ml</td>
<td>0.15 kPa</td>
</tr>
<tr>
<td>4 Piece</td>
<td>Labyrinth/Foam</td>
<td>Inline</td>
<td>122 x 106 x 38</td>
<td>100 gram</td>
<td>90% min.</td>
<td>60 ml</td>
<td>0.15 kPa</td>
</tr>
<tr>
<td>2 Piece</td>
<td>Labyrinth/Cent.</td>
<td>Inline</td>
<td>122 x 106 x 38</td>
<td>35 gram</td>
<td>75% min.</td>
<td>30 ml</td>
<td>0.10 kPa</td>
</tr>
</tbody>
</table>

General Design Features:

- Adaptable to different port directions & different port connection types
- Wide range of dust capacity: 5g to 100g
- Efficiencies: 70% to 90%
- Mounting location flexibility: Remote mounted or integral to canister
- Robust against water intrusion
- Centrifugal Filters and Filters with filter medium: Remote mounted or integral to valve
Canister Vent Solenoid Valves
Application and Enhanced Value

Application (Gasoline Vehicles):
- Typical OBD Evaporative Fuel Emissions System

Enhanced Value:
- Supplying value added systems and modular assemblies including items such as hoses, pipes, brackets, clips and filters