

DuraSeal[®]

UL 1738/ULC S636 Special Gas Vent



A DuraVent White Paper

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ABSTRACT

DuraVents DuraSeal Special Gas Vent system, Models DS/DSD/DSID/DSLS/DSL D and Flex, is the industry's leading innovative flue gas venting solution for high efficiency gas heating appliances. This white paper will provide an overview of features and benefits of DuraSeal and demonstrate its superiority over competitive products.

WHY CHOOSE DURAVENT?

For over 60 years, DuraVent has built a reputation as one of the most trusted suppliers of venting systems in North America. Our dedication to quality lives in the research and development of new products for the residential and commercial markets. With over 225,000 square feet of manufacturing and R&D capacity in the US we are fully equipped and accredited to test our products in accordance with the latest UL and ULC standards.

Working with our Commercial CAD Layout Design Team and DuraQuote® quoting system enables vent system layouts to be obtained in real time and allows our representatives to quote projects in the most rapid manner available in the venting industry. Our years of experience in venting assures speedy, reliable, and efficient system design.

WHAT ARE THE BENEFITS OF DURASEAL?

More rigid and faster to install than most competitive models available on the market today, DuraSeal features the built-in, no tool DuraLock Fastening System which incorporates clips to fasten the vent together quickly, saving valuable time on the job reducing overall labor. DuraSeal can also be taken apart and easily reassembled, making inspection, maintenance or rerouting of DuraSeal systems simple and straightforward.

Designed for installation on high efficiency gas heating appliances that typically generate very low flue gas temperatures, DuraSeal is constructed of type AL29-4C® Stainless Steel featuring a Viton® O-ring gasket at every joint, and is engineered to provide superior resistance to acidic condensation.

AL29-4C® super-ferritic Stainless Steel is the obvious choice for single wall systems (Model DS/DSLS) and inner pipe construction for double wall systems (Models DS/DSID/DSL D). Type 441 Stainless Steel outer pipe construction on double wall systems provides greater resistance to oxidation, corrosion, and stress cracking resistance than Type 430 Stainless Steels used on competitive products. Viton provides equal heat resistance protection when compared to Silicone, but demonstrates superior resistance to sulfurous and carbonic acid, making Viton the better choice of gasket material. A Viton gasket at every joint ensures a trouble-free gas and condensate tight venting system.

WHY DOES DURASEAL FEATURE A GASKET AT EVERY JOINT?

DuraSeal is a versatile product that is engineered to provide venting solutions for multiple applications. To withstand these conditions, special gas vents must be designed to resist pressure and seal against condensate leakage. Special gas vents are tested in accordance with UL 1738 Standard for Safety, Standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV. DuraSeal is ETL listed and tested in accordance with UL 1738 and ULC S636 for installation on gas burning appliances rated under 4 categories:

- Category I appliances operate under negative pressure without condensation
- Category II appliances operate under negative pressure with condensation
- Category III appliances operate under positive pressure without condensation
- Category IV appliances operate under positive pressure with condensation

DuraSeal offers a 15-year Limited Warranty that warrants your DuraSeal gas vent system to be free from defects in material and workmanship, including all components and fittings. Competitors offer field service guarantees claiming 3 years of leak free operation. At DuraVent, we know that a properly designed and installed DuraSeal System will ensure leak free operation – our product is Engineered for superior performance and we stand behind our products!



WHY VITON®?

Viton was introduced in 1957 as a high-performance aerospace sealing elastomer and is now also used in other industries including automotive, fluid power, appliance, and chemical industries, noted for its outstanding performance in very hot and extremely corrosive environments.

Viton demonstrates a greater chemical resistance and higher temperature resistance over silicone. Market research has demonstrated that most competitor special gas vent designs are susceptible to silicone joint degradation, experiences mainly on horizontal vent runs where condensate accumulates on the joint and degrades the silicone gasket to a point where it cracks and creates a leakage point.

Viton has excellent resistance to oils, fuels, lubricants, and most mineral acids, demonstrating extremely low permeability to a broad range of substances. Viton is resistant to aliphatic, aromatic hydrocarbons and is extremely resistant to compression set, even at high temperatures and has exceptionally good resistance to atmospheric oxidation, sun, weather, fungus, and mold.

THERMAL PROPERTIES OF VITON:

Heat — Compared to most other elastomers, Viton is better able to withstand high temperature, while simultaneously retaining its good mechanical properties. Oil and chemical resistance are also essentially unaffected by elevated temperatures. Compounds of Viton remain substantially elastic substantially indefinitely when exposed to laboratory air oven aging up to 400 °F (204 °C) or to intermittent exposures up to 600 °F (316 °C).

Cold — Viton is generally serviceable in dynamic applications to temperatures of -1 °F to -9 °F (-18 °C to -23 °C). Special formulations permit its use in static applications down to -65°F (-54 °C). Also, Viton has proven to be satisfactory for static seals used under conditions approaching absolute zero.

WHAT IS UL 1738?

UL 1738 Standard for Safety, Standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV, requirements cover venting systems intended for venting Category II, III, or IV gas-burning appliances as defined by the Standard for Gas-Fired Central Furnaces (except Direct-Vent Central Furnaces), ANSI Z21.47 and the National Fuel Gas Code, NFPA 54. Venting systems covered by these requirements are intended to be used with Category II, III, and IV appliances that have been installed in accordance with NFPA 54, and with codes such as the BOCA National Mechanical Code, the Standard Mechanical Code, the Uniform Mechanical Code, and local codes. UL 1738 specifically addresses the construction requirements, test performance criteria, marking requirements, and Installation and Maintenance Instructions of the vent system.

WHAT IS THE MAXIMUM TEMPERATURE RATING OF DURASEAL?

The rated maximum operating temperature for high efficiency appliances is 480 °F (249 °C), and most systems operate well below that temperature. The DuraSeal Venting System has been tested and certified to withstand up to 550 °F (288 °C).

Additionally, DuraSeal (Models DS/DSID up to 24") is listed to UL 641 and ULC S609 as a Type L Vent for venting approved oil or gas appliances producing draft hood flue gases not exceeding a temperature of 570 °F (299 °C). This additional listing provides a more versatile product that covers dual fuel appliances that allow for an appliance to run in emergency situations, which is crucial for school and healthcare environments.

WHAT ARE THE PRESSURE LIMITATIONS OF DURASEAL?

The DuraSeal vent system must withstand a minimum pressure of 1.25-inch W.C. as defined in the UL 1738 test standard. DuraVents design philosophy of providing the industry's best flue gas venting solutions lead to testing and certifying the vent and each of the joint to a pressure of 90-inch W.C., allowing us to rate our system to a maximum of 35-inch W.C.

WHAT ARE THE CLEARANCES TO COMBUSTIBLES?

Tables 1 & 2 show the required MINIMUM AIRSPACE CLEARANCE TO COMBUSTIBLES. "Combustibles" include framing lumber, drywall, plywood, paneling, insulation, wiring, and other building materials.

Minimum Clearance to Combustibles Single Wall DS - DSLS						
Diameter	Rated Operating Temp	Max Operating Temp	Enclosed (4 sides)		Unenclosed (2 sides max.)	
			Horiz.	Vert.	Horiz.	Vert.
4" to 12"	480°F (250°C)	550°F (288°C)	N/A	N/A	2"	2"
14" to 24"	480°F (250°C)	550°F (288°C)	N/A	N/A	4"	4"
26" to 36"	480°F (250°C)	550°F (288°C)	N/A	N/A	6"	6"

Table 1

Minimum Clearance to Combustibles Double Wall DSD - DSID - DSLD						
Diameter	Rated Operating Temp	Max Operating Temp	Enclosed (4 sides)		Unenclosed (2 sides max.)	
			Horiz.	Vert.	Horiz.	Vert.
4" to 12"	480°F (250°C)	550°F (288°C)	N/A	1"	1"	1"
14" to 24"	480°F (250°C)	550°F (288°C)	N/A	1"	3"	1"
26" to 36"	480°F (250°C)	550°F (288°C)	N/A	2"	6"	2"
4" to 12" L-Vent	480°F (250°C)	550°F (288°C)	N/A	2"	2"	2"
14" to 24" L-Vent	480°F (250°C)	550°F (288°C)	N/A	2"	3"	2"

Table 2

Always consult local code, Authority Having Jurisdiction, and appliance instructions when designing your vent system. To ensure a long-lasting trouble free operation, DuraSeal vent systems must be installed in accordance with the manufacturer's installation instructions. As with any vent system, routine annual visual inspection is required.

For more information and literature on DuraSeal Special Gas Vent systems, and to find your local DuraVent Manufacturers Representative, please visit:
www.duravent.com.

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