## **Installation and Maintenance Instructions**

# Heatfab Saf-T Vent<sup>®</sup> EZ Seal Plus/EZ 316

Single Wall Gas Vent Connector, Chimney Liner and Special Gas Vent (US) / Type BH Vent Class I/II (Canada)

### Residential, Commercial & Industrial Appliances Category I, II, III & IV Appliances

For use on Negative, Neutral and Positive Pressures Model EZ Seal Plus/EZ 316: 3"-5" Dia. up to 9" W.C.

Important: Do NOT install this product until you have read and fully understand these installation instructions. Failure to comply with these instructions may result in injury or damage to property. An improper installation will void any stated warranty.

- Follow these instructions exactly as written.
- Examine all components for possible shipping damage prior to installation.
- Proper joint assembly is essential for a safe installation. Check integrity of joints upon completion of assembly.
- This venting system must be supported in accordance with these instructions.
- Check for restricted vent movement through the walls, ceilings and roof penetrations. This venting system must be free to expand and contract.
- Do not mix Heatfab Saf-T vent pipe with pipe from different manufacturers.

**WARNING!!** 

Failure to follow the installation instructions could cause FIRE, CARBON MONOXIDE POISONING, OR DEATH. If you are unsure of installation requirements, please call the phone number listed on the instructions or visit the website shown.



Tested and Listed to UL1738 & ULC S636 By Underwriters Laboratories, Inc.



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### **APPLICATION INFORMATION**

Saf-T Vent Model EZ Seal Plus/EZ 316 Gas Vent Systems may be used to vent safety certified Category I, II, III, IV and Certain Direct Vent gas appliances with a flue gas temperature of not more than 550° F (288° C). When used as a masonry chimney liner, Saf-T Vent EZ Seal Plus/EZ 316 can be used to vent condensing oil appliances and category I, II, III, IV gas fired appliances. The Saf-T Vent EZ Seal Plus/EZ 316 system is for use with appliances which produce positive vent pressures of 9 inches of water column or less. Because these types of appliances may produce vent gases under positive pressure and/or at or near their dew point, special installation considerations may be required. Install in accordance with these instructions and those of the appliance manufacturer. Consult the appliance manufacturer's instructions for the maximum horizontal length of the vent connector as well as any restriction on total vent height, proper sizing of the vent, common venting considerations and procedures for connecting the vent to the appliance.

The installation must conform to applicable National, Regional, State and local codes. Contact the Authority Having Jurisdiction prior to beginning any work to obtain any required permits.

### **Pre-Installation Considerations:**

Proper planning prior to installation is essential for maintaining proper clearances and for avoiding possible contact with concealed plumbing or electrical wiring inside walls, floors and ceilings. A continuous straight-line upward pitch of at least 1/4 inch (2 degrees) rise per foot on horizontal runs must be maintained in order to properly rid the system of the corrosive condensate. Be sure to plan a sufficient number of supports for the entire system to maintain the required straight-line pitch and to hold the system in place. Where the vent is enclosed within a chase, the enclosures should be built to permit future inspection of the system.

Reference Combustion & Ventilation Air on the last page for proper air supply guidelines

### **Personal Safety**

Wear eye protection and heavy gloves throughout the installation. In addition, wear an approved dust and vapor respirator whenever in contact with building insulation. Proper and safe scaffolding and/or ladders should be used. Check overhead for antennas, power lines or other obstacles before erecting ladders or scaffolding and while working with conduit on any roof structure.

### **Tools Required for Installation**

Common building tools including but not limited to a Tape Measure, Pliers, Screw Drivers, Saws and/or Snips, Drills, Drop Cloth(s); Ladder/Scaffold; Safety and Personal Protective Clothing.

### **Definitions:**

- 29-4C The conduit material for EZ Seal Plus (excludes EZ 316) is a super ferritic stainless steel alloy designed for extreme resistance to chloride ion pitting, crevice corrosion and stress corrosion cracking (identified by the UNS designator S44735).
- 316L An austenitic chromium-nickel stainless steel containing molybdenum. Type 316L is an extra-low carbon version of Type 316 that minimizes harmful carbide precipitation due to welding. Type 316L is used in applications where immunity to carbide precipitation due to welding assures optimum corrosion resistance. 316L may be identified by the UNS designator S31603.
- **Category I Appliance** An appliance which operates with a non-positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the appliance.
- **Category II Appliance** An appliance which operates with a non-positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the appliance.
- **Category III Appliance** An appliance that operates with a positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the appliance.
- **Category IV Appliance** An appliance that operates with a positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the appliance.

### **Clearance to Combustibles and Framing Requirements**

Table 1 shows the required MINIMUM AIRSPACE CLEARANCE TO COMBUSTIBLES. "Combustibles" include framing lumber, drywall, plywood, paneling, insulation, wiring and other building materials. This airspace clearance is required for safe operation of the vent. Failure to follow these clearances could overheat the building materials and could cause fire.

	Max Appliance	Minimum Clearance				
Pipe Size	Flue Gas	Enclosed Vent		Unenclosed Vent		
	Temperature	Vertical	Horizontal	Vertical	Horizontal	
3" - 5"	230°F*	0"	0"	0"	0"	
3" & 4"	480°F	4"	8"	1"	1"	
3" & 4"	550°F	4"	N/A	1"	1"	
	400°F	4"	N/A	1"	1"	
5"	480°F	5"	N/A	1"	1"	
	550°F	6"	N/A	1"	1"	

Table 1. Minimum Clearance to Combustibles

\* per ULC-S636

### Vertical (Floor, Ceiling and Roof) Penetrations

Where the vent passes through a floor, ceiling or roof, the hole size or framing dimension must maintain minimum clearances per Table 1. Floor and Ceiling penetrations require a Fire Stop be installed. See Fire Stop section for installation instructions.

### Horizontal (Wall) Penetrations

Horizontal systems passing through a combustible wall require the use of a Wall Thimble, for relative temperatures with clearances. See Table 2 for proper framing dimensions and refer to Wall Thimble section for installation instructions. Non-combustible wall penetrations do not require a Wall Thimble.

Pipe Size	Minimum Framing Dimensions Wall Thimble
3"	6.5" x 6.5"
4"	6.5" x 6.5"
5"	10" x 10"

Table 2. (Minimum Framing Dimension)

### **TYPICAL INSTALLATIONS**





Fig 2. (Horizontal Termination)

In addition to the configurations shown in Figs. 1 & 2, this system may be installed in any combination of vertical and horizontal, enclosed and unenclosed configurations as long as minimum clearances are maintained per clearance Tables 1 & 2 and the total length and number of fittings does not exceed the appliance manufacturer's recommendations. This system may also be installed within an existing masonry chimney.

Notes:

- 1. Unenclosed systems require at least one side open (combustible material on maximum of 3 sides).
- 2. Reduced clearances may be attained by using noncombustible enclosures.
- 3. Do not wrap or place insulation around these systems in an effort to reduce clearance to combustibles, create some type of fire protective enclosure or for any purpose, unless Heatfab has reviewed the practical engineering feasibility of such application. Ultimately, the Authority Having Jurisdiction will need to approve any Heatfab engineering judgment that is offered since this has not been specifically UL tested and listed by Heatfab.

### **VENT ROUTING LIMITATIONS - MAXIMUM EQUIVALENT LENGTHS**

In order to insure the vent system is not overly restrictive to flow, refer to the maximum length of vent specified by the appliance manufacturer. In order to account for turns in the system (which cause additional resistance to flow) most manufacturers recommend using an "Equivalent Length" method of determining the limitations. Via such method, elbows and tees are assigned an "equivalent length" (in feet). If the sum of straight length segments and additional "equivalent lengths" (due to turns) exceeds the limit specified by the manufacturer, the routing is not permitted. See appliance manufacturer's instructions for additional information.

### **GENERAL INSTALLATION REQUIREMENTS**

- 1. Failure to conform to any of these requirements may violate local, state, national or international codes as well as create conditions which may cause catastrophic property damage or personal injury. Failure to conform to any of these requirements will also void any warranties, stated or implied.
- 2. Saf-T Vent pipe sections *must* be used throughout the entire length of the system. Alternatives such as galvanized pipe, PVC, nonmetallic pipe, prefabricated chimney, field-fabricated vents or Type B vent sections must not be used. Do not mix pipes, fittings, or joining methods from different manufacturers.
- 3. If called for by the appliance manufacturer's instructions, a drain fitting must be located as close as possible to the appliance flue outlet.
- 4. All joints must be sealed with a factory adhered seal or approved sealant. Allow any field-applied sealant to cure for 24 hours before operating the appliance.
- 5. More than one appliance may not be interconnected to any part of the venting system, unless specifically allowed by each of the appliance manufacturers' instructions. Under *no* circumstances should a natural draft appliance be interconnected with a forced draft appliance. All connected appliances must be all natural draft or all forced draft. When venting multiple forced draft appliances, precautions must be taken to prevent back flow of draft.
- 6. Any penetrations of ceilings, floors, or walls must be properly fire-stopped.

7. The vent system shall not be routed into, through or within any other actively used vent or chimney.

### HORIZONTAL INSTALLATION REQUIREMENTS

- 1. The horizontal vent connector must slope *upward* (consistently) toward the termination at least 1/4 inch per foot and be installed so that all condensate runs back toward the appliance or inline drain and is not retained in any part of the venting system.
- 2. The vent system must terminate with one of the Saf-T Vent terminations or other terminations as specified or provided by the appliance manufacturer, or approved mechanical vent devices.
- 3. The Termination Location:
  - a. The vent shall terminate at least 3 feet above any forced air inlet located within 10 feet.
  - b. The vent shall terminate at least 4 feet below, 4 feet horizontally from or 1 foot above AND 2 feet horizontally from any door, operable window or gravity air inlet into any building. Exception: Direct Vent appliances may be listed for alternate spacing.

- c. The vent termination shall be at least 12 inches above grade or, in geographical areas where snow accumulates, at least 12 inches above the anticipated snow line.
- d. Through-the-wall vents for Category II and IV appliances and noncategorized condensing appliances shall not terminate over a public walkway or an area where condensate or vapors could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves or other equipment. In colder climates where ice buildup is likely to occur, venting



Fig 3. (Horizontal Installation Requirements)

manufacturer will **NOT** be held liable for any personal injury or property damage due to any formation of ice.

- e. Horizontal supports are required for every 6 feet of horizontal run and after every transition from vertical to horizontal.
- 4. The total continuous distance of the vent system from the appliance flue collar to the termination shall not exceed that specified in the appliance manufacturer's installation instructions. When venting natural draft appliances the termination must be at least 5 feet above the topmost draft hood. Otherwise a Listed mechanical draft inducing device is required.

### VERTICAL INSTALLATION REQUIREMENTS

- 1. The vent system must terminate at least 3 feet above the roof line and at least 2 feet higher than any portion of the building within 10 feet, for Category I and II appliances.
- 2. When terminated at a height of more than 6 feet the stack must be supported by a Saf-T Vent Guy Section. 3-Tab Guy Section and Pitched Storm Collar required. It is recommended to use CI Plus/CI 316 exterior to a building.



(2 Ft. Above Structures within 10 Ft.)

3. The vent system must terminate with one of the Saf-T Vent Terminations; except:

### Fig 4. (Vertical Installation Requirements)

- a. Category I or II appliances (natural draft) must use a Saf-T Vent Rain Cap with windband.
- b. Vent systems without provisions for draining rain water must use a Saf-T Vent Rain Cap.
- c. Terminations or approved mechanical vent devices specified or provided by the appliance manufacturer are permitted.
- 4. The total continuous distance of the vent system from the appliance flue collar to the termination shall not exceed that specified in the appliance manufacturer's installation instructions. When venting natural draft appliances the termination must be at least 5 feet above the topmost draft hood. Otherwise a Listed mechanical draft inducing device is required.
- 5. In general, systems installed in cold climates perform best, and condensation is reduced, when the system is fully enclosed by some part of the building structure.
- 6. In cold climates do not install a condensate drain on the exterior of the building. Doing so may result in dangerous icy conditions on surfaces near the drain and may cause damage to the vent system and/or the building exterior. Venting manufacturer will **NOT** be held liable for any personal injury or property damage due to any formation of ice.





Fig 5. (Ring and Tab Connection)

### Connection

Note: It is <u>required</u> to liberally apply gasket lubricant (p/n 7001SIL-5, sold separately) to the factory installed integral gasket when assembling the pipe. Apply lubricant directly to the gasket on the inside female pipe end, both edges of gasket.

- 1. Connect parts using the Ring and Tab Connection Method. See Fig 5.
  - a. To connect, slide the lock ring away from the end to allow clearance for the tabs extending from the female end.
  - b. Engage the two sections making sure the tabs stay to the outside of the vent.
  - c. After the sections are fully engaged, slide the lock ring down over the tabs, making sure all tabs are contained within the lock ring.
  - d. Bend the tabs back over the lock ring to complete the joint. Note: Some termination parts have a hose clamp in place of the lock ring. In such cases, the hose clamp is tightened down over the tabs. The tabs need not be bent over the clamp.

#### **Condensate Drains:**

- A Saf-T Vent In-Line Drain Section or Boot/Lateral Tee with a separate Drain Tee Cover is typically required for all condensing vent systems and the quantity and location is indicative of the vent system layout, length and changes in direction. Exceptions could be, but are not limited to, a simple straight vertical run with the appliance having an integral drain.
- A condensate drain is required for every 30 feet of a straight line run of horizontal pipe and at/near the bottom of a vertical stack. The following are additional suggested drain locations:
  - After an elbow for a horizontal change in direction to prevent collection of condensate in an elbow.
  - After an elbow going from vertical to horizontal
  - After the use of a step-style increaser
- Use the In-Line Drain Section for a straight horizontal run. Rotate the fitting so that the drain tube is pointing down.
- A Condensate Drain Tube Kit is available to direct the condensate to an appropriate location, i.e. floor drain or vented sanitary sewer connection. A trap loop must be formed into the drain hose and must be a diameter that is at least four times the appliance's rated stack pressure in inches of water column or 3 inches, whichever is greater. Secure the loop with a cable tie. Prior to final assembly the trap loop must be 'primed' by pouring a small quantity of water into the drain hose.
- Follow all local and national codes and regulations for the draining of acidic condensate.
- In cold climates do not install a condensate drain on the exterior of the building. Doing so may result in dangerous icy conditions on surfaces near the drain and may cause damage to the vent system and/ or the building exterior. Venting manufacturer will *NOT* be held liable for any injury or property damage due to formation of ice.

### **Adjustable Section:**

The Saf-T Vent EZ Seal Plus/EZ 316 Adjustable Length Section serves as a variable length between other components when specific lengths cannot be utilized and eliminates the need to cut parts to length. To install, refer to installation instructions included with the Adjustable length.

Customized Lengths— Cutting Standard Lengths



Fig 6A. (Boot Tee w/ Drain Cover & Tube)



#### Fig 6B. (In-Line Drain Sectionand Drain Tube)



Fig 7. (Adjustable Length)

The Saf-T Vent EZ Seal Plus/EZ 316 system is designed so that in most cases standard lengths will not need to be cut. There may arise, however, an occasional situation where standard lengths and adjustable length slip connectors are not adequate. In such cases, a standard length of Saf-T Vent may be field cut.

To custom cut a standard length part:

- 1. Measure the length of vent needed (Dim A) and add 3 inches to the result.
- Measuring from the female end (end with the tabs) measure out the distance A + 3" and mark it on the pipe.
- Cut the pipe with an abrasive cutoff, plasma, or compound snips.
  To help get a square cut, create a straightedge by

wrapping masking tape around the waste side of the cut point.

If using snips, start the cut at the male end and follow a spiral path around the pipe until the cutoff mark is reached.

- 4. File off any burrs that develop in the cutting process prior to assembling. If the cutting process distorts the roundness of the pipe carefully use your thumbs to re-round the end.
- 5. Apply high-temperature silicone sealant to the field-cut joint.
- 6. Assemble the joint using the procedures above.
- 7. A hose clamp must be used to retain the tabs.

### Vertical and Horizontal Support

For proper installation, Vertical and/or Horizontal supports must be installed to support the Saf-T Vent. Refer to Table 4 for minimum spacing distances and the corresponding section for instructions for installing the support. Note: For all support options, ensure all minimum clearance to combustibles are maintained. Never drill or screw through the Saf-T Vent system.

### **Guy Support Section**

The Guy Support is a short section of vent pipe with brackets protruding from it. These brackets provide a means for attaching a guy line, threaded rod or similar metal bracing to provide support to the vent system. To Install: Connect Guy Section to the vent using standard joint connection method. Attach guy wires or metal bracing to the brackets provided on the Guy Section. Anchor guy wires or bracing to the building infrastructure capable of supporting the load of the vent (See Fig. 9).

### Fire Stop

Wherever the vent passes through a ceiling or floor a Fire Stop (5x18Cl) must be installed. To Install: Establish the correct framing dimension (See Table 1) and nail the Fire Stop to the joist (Fig 10). Route the vent through the Fire Stop plate. Caution about insulation in attics – Note: When installing a Fire Stop in the attic, the Fire Stop should be located on the top of the joist to prevent insulation from falling into the joist. **Keep all attic insulation the proper minimum clearance from pipe** by installing an enclosure or similar around the pipe.

### Support Clamps

Support Clamps may be suspended from rods or cables and used as a



### Fig 8. (Cutting Standard Lengths)

Spacing Between Supports					
Diameters	Vertical Spacing	Horizontal Spacing			
3" thru 5" 30'		Every six (6) feet and after every transition from vertical to horizontal.			





Fig 9. (Guy Support Assembly)





Fig 11. (Support Clamps)

saddle to rest the vent in or they may be used in pairs to clamp around the vent and suspended from a single rod, cable (See Fig. 11).

### 2" Clearance Horizontal Support

The 2" Clearance Horizontal Support provides horizontal support for the vent and maintains a minimum of 2" of clearance to the wall. To install: Secure the mounting plate to the wall by installing fasteners through the pilot holes in the mounting plate, and into the wall. Install a pair of Support Clamps around the vent, and secure the Support Clamp to the Horizontal support by installing a bolt through the mounting tabs on the Support Clamps and through the pilot hole in the 2" Horizontal Support (See Fig. 12).

### **1" Clearance Support**

The 1" Clearance Support provides horizontal and/or vertical support for the vent and maintains a minimum of 1" air clearance. To Install: Secure the 1" Clearance Support to the wall or ceiling by installing screws through the mounting plate and into the mounting surface. Route the vent through the adjustable clamps and secure by tightening the Worm Gears (See Fig. 13).

### Flashings

The flashing should be installed where the vent pipe passes through a roof and is used to seal the opening in the roof from the outside. The flashing should be located so that the vent is vertical and proper clearance is maintained as the vent passes through the roof. The Tall Cone Flashing is used on flat roofs only. Once located, each corner of the base flange should be nailed to the roof.

The Adjustable Roof Flashing is for pitched roofs. The low end portion of the base should be installed on top of the roofing material. The upper end of the flashing base should be nailed to the roof and roofing material should cover over the upper part and sides of the flashing base (See Fig. 14).

### Storm Collar

The Storm Collar is designed to shed rain away from the flashing opening. To install, place the Storm Collar over the last segment of vent and slide it down to where it contacts the flashing. Depending on the type of storm collar you have, tighten the worm gear or the bolts on the tab to secure the Storm Collar to the vent. Apply silicone sealant over the joint between the vent pipe and the Storm Collar (see Fig. 14).

### **Rain Cap**

The Rain Cap terminates the vent system and prevents rain from entering the vent. Refer to Vertical Termination Requirements section for guidelines for locating the Rain Cap. To Install: Once the proper height and clearance is established, the Rain Cap connects to the vent pipe via standard Ring and Tab connection method. Refer to Joint and Connection Section for instructions on proper joint connection method (See Fig. 14).

### Wall Thimble

The Wall Thimble is used for passing the vent through combustible interior or exterior walls (See Fig. 15).



Fig 12. (2" Clearance Support)



Fig 13. (1" Clearance Support)



### Fig 14. (Flashing, Storm Collar & Cap)



Fig 15. (Wall Thimble)

#### To Install:

- Prepare a square or round opening in the wall. Refer to Table 2 to for proper hole size.
- 2. Select one half of the Wall Thimble and position it so the shield extends into the wall section.
- From the opposite side of the wall, position the other half of the wall thimble so that the shield extends into the wall and engages with the other half of the Wall Thimble. Note: The thimble shields must overlap a minimum of 1". If the wall is thicker than 6", the shields may be extended by using a piece of 6" Diameter galvanized pipe.
- 4. Apply silicone sealant to seal the trim plate to the wall surface.
- 5. Use 4 #10x1-1/4" wood screws to secure the Wall Thimble to the wall.



Fig 16. (Wall Thimble & Elbow Termination)

- 6. Route the vent through the opening in the Wall Thimble and seal the annular space between the vent and Thimble with silicone sealant.
- 7. The Wall Thimble Assembly may be painted to match the wall décor.

### **Horizontal Termination**

The Horizontal Termination is used to terminate a horizontal vent system. There are several different Horizontal Termination styles available. These include the Mitered Termination Screen, an Elbow Termination and a Screen Termination. All Horizontal Terminations install the same way by connecting them to the vent pipe via standard Ring & Tab Connection method. The Horizontal Termination must terminate a minimum of 6" from the wall (See Fig. 16 & 17).

#### **Appliance Connectors**

Connect the Saf-T Vent system to the appliance flue collar as

directed in the appliance manufacturer's instructions. If the appliance flue collar is not designed for direct connection to the Saf-T Vent system, a special appliance adapter may be required. See Heat-Fab appliance adapter chart, the appliance manufacturer's instructions or contact Heat-fab for recommended adapters.



### Fig 17. (Horizontal Terminations)

### **Combustion & Ventilation Air:**

In order for appliances and their vent / chimney systems to operate properly they require a plentiful supply of clean combustion and ventilation air. Requirements for such combustion and ventilation air are found in the installation and maintenance instructions accompanying the appliance as well as in vent manufacturer's literature and various mechanical codes. Seek and follow guidelines provided there when installing an appliance / vent system.

In addition to a plentiful source, it is very important for the combustion air to be free of certain chemical contaminants that can be very corrosive in nature to the appliance and / or venting system during and as a result of the combustion process.

In some cases, the use of indoor air is acceptable with the exceptions stated below. However, wherever possible, it is best to take combustion air directly from the outside, unless outdoor air has contaminant vapors nearby as listed below.

The following common list of substances need to be avoided in all instances since vapors associated with them – if mixed with the combustion air – can be extremely corrosive to the appliance and / or venting system. \*Please note this list is not exclusive as to substance or effect and may be supplemented at any time.

- a. Permanent wave solutions
- b. Chlorinated waxes and cleaners
- c. Chlorine based swimming pool chemicals
- d. Water softening chemicals
- e. De-icing salts or chemicals
- f. Carbon tetrachloride
- g. Halogen type refrigerants

- h. Cleaning solvents (i.e. perchloroethylene)
- i. Printing inks, paint removers, varnishes, etc.
- j. Hydrochloric acid
- k. Cements and glues
- I. Laundry room detergents, fabric softeners
- m. Masonry acid washing materials

Corrosion of the vent / chimney caused by the use of contaminated combustion air voids the warranty on these products.

Flue gas condensate with PH levels below 2.5 may also void the warranty. PH levels should be monitored regularly and if below 2.5, should be addressed with the boiler OEM on methods to raise it.

### **Maintenance Procedures:**

•Normal operation of gas burning appliances does not result in deposits of combustible soot in venting systems. However, a poorly adjusted or malfunctioning appliance can deposit soot and other debris which can enter the vent system. As with all vents, the Saf-T Vent system should be inspected at least annually for the presence of deposits of soot or debris. Any such accumulation should be removed and the appliances adjusted to eliminate future accumulation.

•At regular periods the system should also be inspected for signs of leakage of condensate or combustion by-products at all joints. If any leakage is found the connected appliances should be turned off and the leaks repaired.

•If the system incorporates a drain hose from either an in-line fitting or from a drain tee then the hose must be inspected periodically to assure that water remains in the trap loop. If a proper trap loop is not maintained exhaust from the connected appliances may accumulate in the building area.

### NOTES

Corporate Headquarters

Duravent Group 28 W. Adams, Suite 1810 Detroit, MI 48226 Email: commercial@duraventgroup.com residential@duravengroup.com (USA) Heatfab: 800.772.0739 (CAN) Heatfab: 800.848.2149

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