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**MAK
 FASTENER
 SPECIALISTS
 LTD**

Fasteners for Roofing, Cladding
 and General Construction

Product Group 39 Explosion Fasteners

Vent-All® Fasteners

Limit damage to buildings from interior explosions

Features & Benefits	Specifications	Product Images
<ul style="list-style-type: none"> ~ Washers designed to collapse under force of interior explosions, allowing panel to separate and vent shock waves ~ Maintains standard building integrity ~ Minimizes damage from explosion by quickly dissipating explosive forces ~ May be used with any sheet or panel, with or without insulation, in field-assembled or shop-assembled walls 	<ul style="list-style-type: none"> ~ 18.5mm O.D. washer with special aluminum alloy bonded with EPDM or neoprene sealant ~ Stainless steel screw with thread styles as required 	
<p>Many industrial and agricultural operations involve highly volatile liquids which are subject to fume emission, or involve dry materials so fine and light they can easily escape into the air. With the presence of these elements, an explosion is an ever-present danger. These solids, gases and vapors can generate shock waves from 35 to 120 psi. Pressures can rise from 200 to 2200 psi per second.</p> <p>This peril has continued to exist despite precautionary training programs for workers, carefully balanced ventilation systems, and the physical separation of processing stages.</p> <p>Since these efforts have not completely eliminated the explosion hazard, it is important to design buildings so that if an explosion occurs, injury and building damage can be minimized.</p> <p>Vent-All explosion venting fasteners, a series of FM approved collapsible washers on stainless steel fasteners, are designed to minimize injury and destruction of property from explosions caused by agricultural or industrial operations.</p>		

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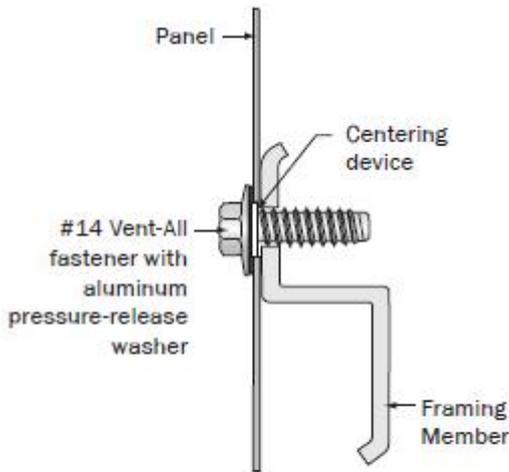
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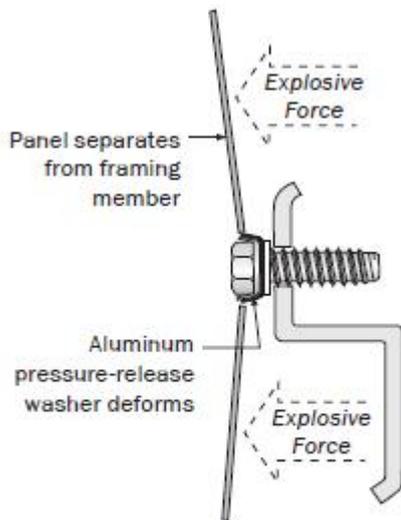
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Normal Installed Condition



Interior Explosion Release Condition

The five styles of Vent-All washers are each engineered to meet a specific range of release values. It is imperative that the correct assortment of fasteners is used to meet the specific requirements of your application.

Selection Guide*

Washer Designation	Color Code	Release Value Per Fastener**
EXA-74	Green	70#
EXA-76	Blue	110#
EXA-79	Tan	175#
EXA-84	Light Green	435#
EXA-19	Light Blue	885#

*See next page for application example and calculation.
 **These are the average release pressures per washer.

It is suggested that all sheets / panels be installed with restraint cables, about three feet long and anchored to the structure, to prevent sheets / panels from becoming flying projectiles.



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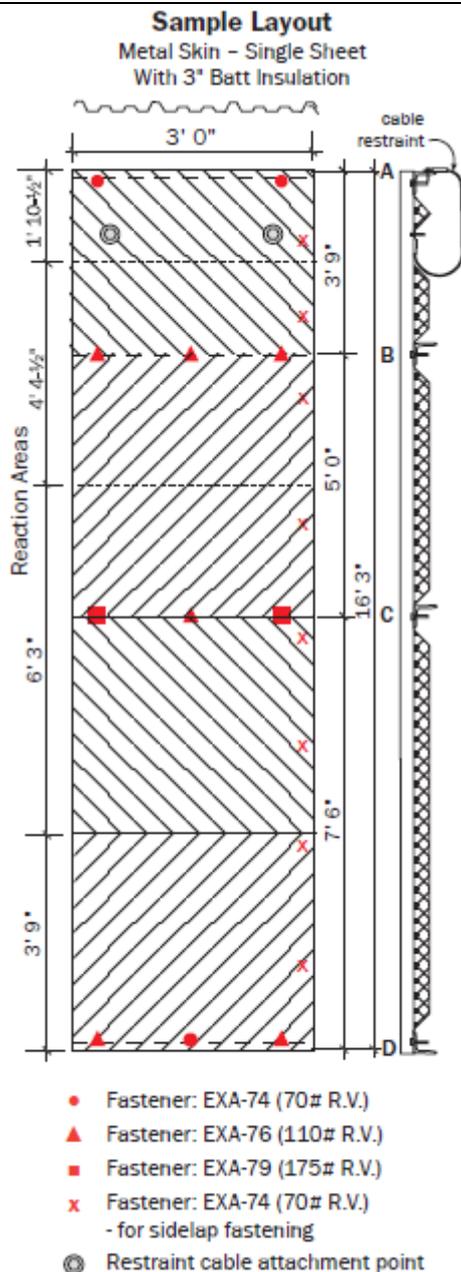
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Applications

The illustrations on this page are provided only to give an overview of the design process. **Fastener layout should be reviewed by an engineer or other qualified application specialist to ensure proper venting function.**

Basic Design Guidelines

It is most desirable to vent shock waves through sidewalls of a structure. Venting through metal roofs can be troublesome because of movement due to expansion and contraction from temperature changes. Built-up roofs also present problems; use of rigid insulation, felts, and ballast would tend to delay venting.

Generally, for each Vent-All fastener, a hole is drilled into the panels and framing; then the hole in the top panel is enlarged to 1/2" diameter. It is necessary to install one centering device per fastener to prevent sagging of the panel. All fasteners must be driven with care to prevent distortion of the washers.

Sample Calculation

Desired Pressure Release: 25 #/F2
 Area to be vented: 3'0" X 16'3" = 48.75 F2
 Side lap Fastening: Approx. 18" on centre

EXAMPLE ONLY; NOT TO BE USED FOR DESIGN

Girt A: 0.5 X 3'9" X 3'0" = 5.6F2
 Required release: (25#/F2) x 5.6F2 = 140.62#
 2 EXA-74 fasteners will provide 140#

Girt B: 0.5 X (3'9" + 5'0") X 3'0" = 13.12F2
 Required release: (25#/F2) x 13.12F2 = 328.12#
 3 EXA-76 fasteners will provide 330#

Girt C: 0.5 X (5'0" + 7'6") X 3'0" = 18.75F2
 Required release: (25#/F2) x 18.75F2 = 468.75#
 1 EXA-76 fastener and 2 EXA-79 fasteners
 will provide 460#

Girt D: 0.5 X 7'6" X 3'0" = 11.25F2
 Required release: (25#/F2) x 11.25F2 = 281.25#
 1 EXA-74 fastener and 2 EXA-76 fasteners
 will provide 290#

Total Provided Panel Release: 1220#

1220# ÷ 48.75SF = 25 #/F2

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EXPLOSION VENTING FASTENER ENQUIRY FORM

DATE: _____

COMPANY: _____

ADDRESS: _____

CONTACT PERSON: _____

PHONE: _____

FAX: _____

BUILDING SIZE: LENGTH: _____ WIDTH: _____ HEIGHT: _____

AREA TO VENT: _____

RELEASE PRESSURE: _____

PANEL COVERING WIDTH AND HEIGHT: _____

INSULATION (if any) / TYPE OF: _____

PURLIN SPACING: _____

TYPE OF PURLIN: _____

EXTRA NEEDED (CABLES, CENTERING DEVICES, ADDED SECTION
FOR ROOF JOBS) _____

COMMENTS: _____

