



**Homeland
Security**

Science and Technology

Summary

U.S. Department of Homeland Security



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems, and provides those results along with other relevant equipment information to the emergency responder community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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Explosive Entry Breaching Frames

(AEL reference number 02EX-00-EXEN)

Explosive entry breaching frames are used by bomb technicians and special weapons and tactics teams to facilitate rapid entry into structures during tactical operations. Breaching frames allow entry teams to quickly set up and place an explosive charge, reducing the team members' exposure to danger.

To provide responders with information on currently available explosive entry breaching frames, the Space and Naval Warfare Systems Center Atlantic conducted a comparative assessment of breaching frames for the System Assessment and Validation for Emergency Responders (SAVER) Program in August 2011. Detailed findings are provided in the *Explosive Entry Breaching Frames Assessment Report*, which is available by request at <https://www.rkb.us/saver>.

Assessment Methodology

Prior to the assessment, eight law enforcement officers with strong explosive ordnance disposal (EOD) backgrounds were chosen from various jurisdictions to participate in a focus group. The group identified evaluation criteria and recommended product selection criteria and possible scenarios for assessment.

After identifying evaluation criteria, the focus group assigned each criterion to one of five SAVER categories, and then assigned a weight for its level of importance. Once the criteria were weighted, the five SAVER categories were assigned a percentage value to represent the level of each category's importance relative to the other categories.

Based on the focus group's recommendations and market research, the following explosive entry breaching frames were selected for assessment:

- Universal Breaching System (UBS) Large Entry Frame, Omni Distribution Inc.;
- GateCrasher Modular, A-T Solutions Inc.;
- GateCrasher MK4, A-T Solutions Inc.;
- GBF-1VF Folding Frame, Gryphon Engineering Services; and
- GBF-1VS Large Breaching Frame, Gryphon Engineering Services.

According to the manufacturers, none of the frames produce hazardous materials by-products when an explosive charge is initiated.



Four certified hazardous devices technicians served as evaluators for this assessment. All evaluators had at least 10 years of EOD experience and were certified in explosive breaching.

During the assessment, evaluators rated the explosive entry breaching frames based on evaluation criteria established by the focus group. The assessment was separated into two phases: the specification assessment and the operational assessment. Evaluators assessed the systems based on vendor-provided information during the specification assessment. Hands-on experience assembling, preparing, deploying, and disassembling the breaching frames served as the basis for the operational assessment. When deploying the breaching frames, evaluators hand carried the breaching frame to the simulated target in one scenario and used a robot to carry the breaching frame in another. The assessed breaching frames were inert; no explosives were used during the assessment, and actual breaches were not performed.

Assessment Results

According to evaluators, all of the assessed explosive entry breaching frames would assist responders in breaching operations. In addition, all five breaching frames are designed for use with multiple types of explosive charges and target construction materials, which evaluators rated favorably. All of the frames are man portable, robot deployable, and designed for use in all weather conditions.

Table 1 displays the composite assessment scores as well as the category scores for each explosive entry breaching frame. Higher scores indicate a more favorable rating by evaluators. The advantages and disadvantages of each breaching frame, as identified by evaluators, are listed in table 2. To view how each breaching frame scored against the evaluation criteria assigned to the SAVER categories, see table 3. For specifications, see table 4.

Responder agencies considering the purchase of an explosive entry breaching frame should review the detailed findings in the *Explosive Entry Breaching Frames Assessment Report* and carefully consider each breaching frame's overall capabilities and limitations in relation to their jurisdiction's operational needs. All reports in this series, as well as reports on other technologies, are available in the SAVER section of the Responder Knowledge Base (RKB) website, <https://www.rkb.us/saver>.

SAVER Category Definitions
Affordability groups criteria related to life-cycle costs of a piece of equipment or system.
Capability groups criteria related to the power, capacity, or features available for a piece of equipment or system to perform or assist the responder in performing one or more relevant tasks.
Deployability groups criteria related to the movement, installation, or implementation of a piece of equipment or system by responders at the site of its intended use.
Maintainability groups criteria related to the maintenance and restoration of a piece of equipment or system to operational condition by responders.
Usability groups criteria related to the quality of the responders' experience with the operational employment of a piece of equipment or system. This includes the relative ease of use, efficiency, and overall satisfaction of the responders with the equipment or system.

Table 1. Explosive Entry Breaching Frame Assessment Results

Product	Composite Score	Affordability (27% Weighting)	Capability (27% Weighting)	Deployability (23% Weighting)	Maintainability (18% Weighting)	Usability (5% Weighting)
UBS Large Entry Frame	4.1	3.9	4.4	3.7	4.5	3.7
GateCrasher Modular	3.8	2.6	4.1	4.2	4.5	3.8
GateCrasher MK4	3.7	2.8	4.0	3.8	4.5	3.9
GBF-1VF Folding Frame	3.1	2.4	3.6	3.9	2.1	3.5
GBF-1VS Large Breaching Frame	3.1	2.6	3.6	3.7	2.1	3.5

Table 2. Explosive Entry Breaching Frame Advantages and Disadvantages

Product	Advantages	Disadvantages
 <p>UBS Large Entry Frame Composite Score: 4.1</p>	<ul style="list-style-type: none"> • Versatile in scalability and configuration (gun port to man size) • Cost effective • Large size • Easy to transport with the robot 	<ul style="list-style-type: none"> • Lengthy preparation time • A few modules developed leaks during deployment • Difficult to carry by hand
 <p>GateCrasher Modular Composite Score: 3.8</p>	<ul style="list-style-type: none"> • Compact/easy to carry (can be folded or rolled up) • Frame is easy to scale to required size • Easy to transport with robot • Easy to store loaded 	<ul style="list-style-type: none"> • High cost • Prop pole attachment is weak (nylon ripped) • Obstructs one of the robot cameras • Increased prep time due to “threading” detonating cord into sleeve • Can only be deployed vertically
 <p>GateCrasher MK4 Composite Score: 3.7</p>	<ul style="list-style-type: none"> • Multiple carrying points • Has a center channel for detonating cord • No tools or tape required for assembly • Large fill point for water • Can mount horizontally or vertically • Rugged frame 	<ul style="list-style-type: none"> • High cost • Heavy • Obstructs the robot drive camera • Detonating cord could be pinched or cut if the frame is stood on end to fill with water • No specified attachment points for prop pole • Difficult for the robot to grasp
 <p>GBF-1VF Folding Frame Composite Score: 3.1</p>	<ul style="list-style-type: none"> • Easy-to-load detonating cord due to the rounded frame • Folds for compact storage • Durable prop stick attachment point • Rugged frame 	<ul style="list-style-type: none"> • No clip or strap to hold it together when folded • Can only be deployed vertically due to prop stick attachment point position • Frame characterization tables are not available • Technical support responsiveness • Limited shelf life • No warranty
 <p>GBF-1VS Large Breaching Frame Composite Score: 3.1</p>	<ul style="list-style-type: none"> • Durable prop stick attachment point • Easy to transport with the robot • Rugged frame 	<ul style="list-style-type: none"> • Difficult to place detonating cord due to square corners • No vent point for filling and emptying water • Can only be deployed vertically due to prop stick attachment point position • Frame characterization tables are not available • Technical support responsiveness • Limited shelf life • No warranty

Table 3. Explosive Entry Breaching Frame Criteria Ratings¹

	KEY				
	Least Favorable	➔			Most Favorable
	UBS Large Entry Frame	GateCrasher Modular	GateCrasher MK4	GBF-1VF Folding Frame	GBF-1VS Large Breaching Frame
Affordability					
Frame cost					
Shelf life					
Training costs					
Capability					
Frame characterization					
Explosives					
Size					
Target construction material					
Deployability					
Man portable					
Robot deployable					
Scalability					
Weight					
Durability					
Portability					
Environmental flexibility					
Maintainability					
Storage requirements					
Warranty					
Usability					
Documentation					
Training					
Ease of assembly					
Ease of disassembly					
Assembly tools					
HAZMAT					
Material construction					
Technical support					

Note:

¹ Averaged criteria ratings for each assessed product are graphically represented by colored and shaded circles. Highest ratings are represented by full green circles.

Table 4. Explosive Entry Breaching Frame Specifications¹

Specifications	UBS Large Entry Frame	GateCrasher Modular	GateCrasher MK4	GBF-1VF Folding Frame	GBF-1VS Large Breaching Frame
MSRP	\$143	\$534 ²	\$356	\$265	\$220
Shelf life	Indefinite	Indefinite	Indefinite	5 years (32°F to 80°F)	5 years (32°F to 80°F)
Dimensions (L x W x D)	52 x 28 x 3 inches	48 x 24 x 3 inches	43 x 23 x 3 inches	36 x 24 x 4 inches	44 x 25 x 4 inches
Scalable	Yes; product can be expanded or contracted	Yes; product can be expanded or contracted	No	Yes; fixed frame	Yes; fixed frame
Unloaded weight	10 pounds 5 ounces	9 pounds	8 pounds 10 ounces	11 pounds	12 pounds
Loaded weight (maximum)	40 pounds 12 ounces	32 pounds	46 pounds 6 ounces	39 pounds	40 pounds
Frame material	HDPE plastic	Nylon sleeve with plastic modules	Plastic	Plastic	Plastic
Storage requirements ³	No storage limitations	No storage limitations	No storage limitations	Store out of direct sunlight at less than 104°F	Store out of direct sunlight at less than 104°F
Warranty	Lifetime (covers manufacturer defects)	Lifetime (covers manufacturer defects)	Lifetime (covers manufacturer defects)	None	None
Frame characterization tables	On request	On request	On request	Tables are not available	Tables are not available
Loading instructions available	Included	On request	On request	On request	On request
Technical support included with purchase	Unlimited	Unlimited	Unlimited	12 months from date of purchase	12 months from date of purchase

Notes:

- ¹ Information was provided by manufacturers and has not been independently verified by the SAVER Program.
- ² Includes four modules at a cost of \$402 and a tactical sleeve at a cost of \$132, which comprises one breaching frame.
- ³ Storage requirements apply to inert frames only; storing frames loaded with explosives may have different requirements.

D = depth
 HDPE = high density polyethylene
 L = length

MSRP = manufacturer's suggested retail price
 W = width