



**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 operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response 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?"

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Multipurpose Reciprocating Saw Blades

As a part of the System Assessment and Validation for Emergency Responders (SAVER) Program, Texas A&M Engineering, including Texas Engineering Extension Service (TEEX) and Texas Transportation Institute (TTI), conducted a comparative assessment of multipurpose reciprocating saw blades. The findings are presented in the Multipurpose Reciprocating Saw Blades Assessment Overview, which is available by request at <https://www.rkb.us/saver>.

Background

While many blades are designed for cutting specific materials (e.g., for cutting wood only or metal only), multipurpose reciprocating saw blades are designed to be used as a single tool for cutting multiple materials. The intent is to allow the user operational flexibility without the inconvenience of changing blades between applications.

A focus group consisting of 11 emergency responder subject matter experts (SMEs) was held by Texas A&M Engineering in January 2007 to identify relevant operating scenarios and provide guidance on test considerations that the most common potential applications for these types of blades would be vehicle extrication, forcible entry for law enforcement and firefighting applications, and other miscellaneous rescue work. They also defines that the overall effectiveness of a multipurpose reciprocating saw blade depends on how well and how quickly a single blade can cut through plastic, glass, metal, masonry and wood.

Assessment

Emergency responder SMEs used the multipurpose reciprocating saw blades for a variety of emergency response-related



Figure 1. SMEs cut 1/2-inch plate steel using multipurpose reciprocating saw blades.

applications including: cutting vehicles, plate steel, hardened bolts, structural timber, composite walls, and other rescue applications (figure 1).

Twelve different multipurpose reciprocating saw blades were included in the assessment. These blades are marketed to emergency responders as being able to cut plastic, glass, metal, masonry, and wood, and represented the known market at the time of the assessment, based on a market survey conducted by TEEEX in January 2007. The selected blades were:

- *Blue-Mol 6490HDB*
- *Bosch RRD9V-25P*
- *DeWalt DW 4865*
- *Flush Cut “Antagonizer”*
- *Lenox B850R*
- *Lenox B960R*
- *Milwaukee 48-00-8713*

- *Milwaukee 48-00-8787*
- *Morse RBFR96210WT20*
- *Morse RBFR96214WT20*
- *Starrett BR818-20*
- *Starrett BTR91014-20*

Assessment Results

Eight emergency responder subject matter experts (SMEs) within 144 years of combined experience participated in the assessment. The evaluators rated the saw blades based on the evaluation criteria established by the focus group and prioritized within three of the five SAVER categories (affordability, capability, and usability). Complete assessment results and SME comments are contained in the full assessment report.

Table 1 lists the composite and SAVER category scored for multipurpose reciprocating saw blades based on a maximum score of 100 points.

The following sections provide a brief summary of SAVER category scoring and evaluator comments on each assessed system.

Lenox B850R

The *Lenox B850R* blade tied for the highest rating of the test set and scored in the top half of the group for all assessment categories (it was the highest rated blade for affordability and usability). The emergency responder SMEs had overall mostly positive comments about the blade, in particular that it was versatile and performed very well in metals.

Milwaukee 48-00-8713

The *Milwaukee 48-00-8713* blade tied for the highest rating of the test set and scored in the top half of the group for all assessment categories (it was the

Saw Blade	Composite Score	Affordability (.09 Overall Weighting)	Capability (.43 Overall Weighting)	Usability (.48 Overall Weighting)
Lenox B850R	85	100	83	84
Milwaukee 48-00-8713	85	98	87	82
Milwaukee 48-00-8787	84	99	85	81
Bosch RRD9V-25P	82	99	78	83
Lenox B960R	80	98	73	82
Morse RBFR96210wt20	79	97	74	79
Starrett BTR91014-20	75	92	73	74
Blu-Mol 6490HDB	74	99	53	81
DeWalt DW 4865	71	99	53	82
Morse RBFR96214WT20	70	97	51	81
Starrett BR 818-20	53	99	48	50
Flush Cut “Antagonizer”	10	8	5	16

Table 1. SAVER Category and Composite Scores for Multipurpose Reciprocating Saw Blades

highest rated blade for capability and tied for the third ranking in affordability). The emergency responder SMEs had overall mostly positive comments about the blade, but there were some mixed comments about the blade’s wear.

Milwaukee 48-00-8787

The *Milwaukee 48-00-8787* blade scored in the top half of the group for all assessment categories (it tied for fourth in usability). The emergency responder SMEs were generally pleased with the blade and

noted that it cut fast initially, but several commented that the blade teeth wore down fast in tough jobs.

Bosch RRD9V-25P

The *Bosch RRD9V-25P* blade scored in the top half of the test group for all assessment categories. The emergency responder SMEs had almost exclusively positive comments about the blade, in particular the durability of the teeth, but several SMEs mentioned that the blade did not perform well for plunge cuts.

Lenox B960R

The *Lenox B960R* blade scored in the top half of the test set for usability and affordability. The emergency responder SMEs recommended the blade and noted that the teeth were durable and it cut vehicle metal easily.

Morse RBFR96210WT20

The *Morse RBFR96210WT20* blade scored in the top half of the test for capability. The emergency responder SMEs had mostly positive comments about the blade, particularly for multipurpose applications. Mixed comments were expressed about its plunge cutting ability, duration, and ability to turn while cutting.

Starrett BTR91014-20

The *Starrett BTR91014-20* blade did not score in the top half of the test group for any assessment categories. Almost all of the emergency responder SMEs commented that blade vibration was excessive and made it difficult to control the saw.

DeWalt DW 4865

The *DeWalt DW 4865* blade scored in the top half of the test set for usability and affordability. The emergency responder SMEs generally felt the blade provided average to excellent performance.

The *Morse RBFR96214WT20* blade tied for the middle ranking in usability. The emergency responder SMEs generally felt the blade provided average to excellent performance. There were several positive comments about blade durability.

Starrett BR 818-20

The *Starrett BR 818-20* blade scored in the top half of the test set for affordability. The emergency responder SMEs had generally negative comments

about the blades performance, particularly that it was too thin, leading to problems with bending and vibration. They did not recommend the blade for firefighting applications.

Flush Cut “Antagonizer”

The *Flush Cut “Antagonizer”* blade was the lowest scoring of the test set for all assessment categories and criteria. The emergency responder SMEs had negative comments about the blade, noting that they could not use it for cutting across a range of materials tested, and they recommended against the blade for firefighting and rescue applications.

Conclusion

Emergency responder SMEs used the multipurpose reciprocating saw blades for a variety of emergency response-related applications: cutting vehicles, plate steel, hardened bolts, structural timber, composite walls, and other rescue applications. Performance differences for different blades were identified for the group of eight SMEs based on how fast they



Figure 2. An emergency responder SME cuts 4x4 structural cribbing using multi-purpose reciprocating saw blades.

were able to cut structural wood cribbing, plate steel, and medium density fiberboard (figure 2). SME observations of the different blades' usability for the response applications were also compared based on their observations of blade performance on cutting vehicles and composite walls. Cost information was also identified

The *Milwaukee 48-00-8713* and *Lenox B80R* blades had the highest overall scores in the test set. The most expensive blade of those that were evaluated, the *Flush Cut "Antagonizer"* was the lowest rated blade.

All reports in this series, as well as reports on other technologies are available on the SAVER Web site <https://www.rkb.us/saver>.