JIFX Experiment Number (*X-00*):1.0

F-01

Experiment Title:

S-Cuts

Organization:

Southwest Synergistic Solutions

Experiment Lead/Point of Contact:

Juan Cienfuegos

Quantitative Results (please be as descriptive and detailed as possible):

Chart of results:

Times to finish cutting & total number of tools used

S-Cut 501	S-Cut QE	Shears	Rescue hook	
48.45 sec.	47.75 sec.	2.36.93 min.	1.33.43 min.	Round 1Time
Original	Original	Original	Original	# of Tools used
47.76 sec.	1.11.37 min.	3.11.78 min.	1.23.72 min.	Round 2 Time
Original	Original	Original	Original	# of tools used
1.32.32 min.	1.10.72 min.	2.50.10 min.	2.23.66 min.	Round 3 Time
Original	Original	Original	Replaced	# of tools

				used
25.81 sec.	45.10 sec.	2.42.03 min.	59.50 sec.	Round 4 Times
Same tool, switched to 2nd edge	Same tool, switched to 2nd edge	Replaced	2nd tool	# of tools used
N/A	N/A	N/A	N/A	Round 5
N/A	N/A	N/A	N/A	# of tools used

Round 1 results:

The S-Cuts were the fastest at removing the clothing. The S-Cut QE was slightly faster than the S-Cut 501 by less than 1 second. The Tytek 5.5” shears took over 3 times, more time to remove the same type of clothing. The Benchmade rescue hooks took almost twice as long as the S-Cuts.

Round 2 results:

The S-Cuts were the fastest at removing the clothing. The S-Cut 501 was the fastest and under a minute. The second fastest was the S-Cut QE, taking only ~23 seconds longer. A close third was the Benchmade rescue hook taking ~12 seconds longer than the S-Cut QE. In last place was the Tytek 5.5” shear taking more than 3 times longer than the S-Cut 501.

Round 3 results:

The S-Cuts were the fastest at removing the clothing. The S-Cut QE was the fastest at ~1 minute, 10 seconds. The S-cut 501 came in second at ~22 seconds longer than the S-Cut QE. The Benchmade rescue hook took more than twice as long as the S-Cut QE at ~2 minutes, 23 seconds and was replaced with a new one for this round. In this round, the Tytek 5.5” shears came in at a close fourth place taking only ~27 seconds longer than the Benchmade rescue hook. During this round, the shears were replaced and a new set used to finish the cutting.

Round 4 results:

The S-Cuts were the fastest at removing the clothing. The S-Cut 501 having been switched to the 2nd fresh edge, of six edges available, came in first with a time of 25.51 seconds. The S-Cut QE was also set to the 2nd fresh edge, of the 5 available edges, came in second taking only ~20

seconds longer. The Benchmade rescue hook came in a close third place taking only ~14 seconds longer than the S-Cut QE. The S-Cut 501, S-Cut QE & the Benchmade rescue hook all took less than 1 minute in this round. The 5.5" Tytek shears took almost 5 times longer than the S-Cut 501 finishing in ~2 minutes, 42 seconds.

Total tools used in the four rounds– 1 S-Cut 501, 1 S-Cut QE, 2 Benchmade rescue hooks, 2 5.5" Tytek shears.

Qualitative Results (please be as descriptive and detailed as possible):

- The four Marines who participated all felt that the S-Cuts are the best choice for specialized units, for example EOD or CST/WMD teams. They also stated the S-Cuts have a place in all types of hospitals.
- Marines commented the S-Cuts were too bulky and that they liked the way the Benchmade rescue hooks fit easily with their gear. They also stated they liked the shears in general because they could be used for a variety of tasks that the Benchmade rescue hooks and S-Cuts could not.
- The types of clothes that were cut included sports coats, work type boots, leather belts, knitted tops, warm up bottoms, cotton shirts, sweaters, tennis shoes, cloth belts, winter boots, leather shoes, jeans and T-shirts. See images and clothing material below.
- Following are the comments from the Marines who participated in the S-Cut experiment when asked questions from both the perspective of the person cutting the clothing from the patient, and as the patient who's clothing was being cut off:

A. Patients perspective, person who's clothing was being removed.

Name - _M K_____

Position - _____

Are you a medic or have prior medical experience (Y/N) - _____N_____

1. What tool was used to cut you out of the clothes?

Benchmade, shears, 501, QE

2. How do you feel the tool performed?

- Benchmade did well, but cutter had to move patient around
- Shears took a long time to remove clothes, dulled easily, had difficulty cutting
- 501 & QE performed very well. Clothes came off easily & they cut through all materials, a lot faster.

3. If multiple tools were used at different times, which ones were they, and share your opinion regarding which performed the best and why?

Best 1: 501, easy to grip

2: QE

3: Benchmade

Worst 4: Shears didn't maintain edge, random part that made it hard to get good cutting angle.

4. Did you feel comfortable with the tool or tools being used?

- I felt most comfortable having my clothes removed by the 501 and QE

Name - M R

Position - Recon Marine w/combat medicine training

Are you a medic or have prior medical experience (Y/N) - Yes

1. What tool was used to cut you out of the clothes?

Benchmade cutter, S-Cut 501, S-Cut QE, Shears

2. How do you feel the tool performed?

They all performed admirably in the light clothing I was wearing.

3. If multiple tools were used at different times, which ones were they, and share your opinion regarding which performed the best and why?

The S-Cut 501 made me feel the most comfortable with having clothing cut off of me, and it seemed to be the smoothest.

4. Did you feel comfortable with the tool or tools being used?

The S-Cut QE would be more realistic if it was smaller.

Name - M F

Position - Recon Marine

Are you a medic or have prior medical experience (Y/N) - Yes, Paramedic and USMC Combat Medicine Training

1. What tool was used to cut you out of the clothes?

The S-Cut 501 & QE

Trauma Shears

Benchmade hook knife

2. How do you feel the tool performed?

Trauma Shears and Bemchmade dulled quickly. S-Cut tools performed smoothly.

3. If multiple tools were used at different times, which ones were they, and share your opinion regarding which performed the best and why?

While the S-Cut tool worked quickest, it was also the smoothest. The hook blade & shears required change out.

4. Did you feel comfortable with the tool or tools being used?

S-Cut tools felt the safest.

Name - M P SGT

Position - Reconnaissance Man

Are you a medic or have prior medical experience (Y/N) - Y prior medical experience

1. What tool was used to cut you out of the clothes?

S-Cut 501, S-Cut QE, Benchmade, Shears

2. How do you feel the tool performed?

S-Cut was the fastest of all of them and it was the only one that did not hurt at all.

3. If multiple tools were used at different times, which ones were they, and share your opinion regarding which performed the best and why?

S-Cuts were two best because they were safer & fastest

4. Did you feel comfortable with the tool or tools being used?

Yes

B. Perspective as the person cutting the clothes of the patient.

Name - M K

Position - _____

Are you a medic or have prior medical experience (Y/N) - N

1. Which tool did you use?

501, QE, Benchmade, Shears

2. How do you feel the tool performed?

The 501 & QE performed really well. Very little effort required to cut the clothing.

3. If you used multiple tools which ones were they, and share your opinion regarding which performed the best and why?

1: 501 – 501 fit in my hands better

2: QE

3: Benchmade

4: Shears

4. Did you feel comfortable using the tool or tools?

With the 501 & QE, I felt more comfortable because I had more control than with the Benchmade

Name - M R

Position - Recon Marine w/TCCC training/combat medicine

Are you a medic or have prior medical experience (Y/N) - Yes

1. Which tool did you use?

Benchmade ripper, S-Cut 501, S-Cut QE, Shears

2. How do you feel the tool performed?

They all performed well, at first. The S-Cuts lasted longer, but the guard got caught in the holes of wool sweaters. The S-Cut QE blade popped out of the guard and was easily put back in position

3. If you used multiple tools which ones were they, and share your opinion regarding which performed the best and why?

The S-Cut 501 worked best for cutting the materials, but the S-Cut QE and Benchmade were right

4. Did you feel comfortable using the tool or tools?

Not around feet, but I did everywhere else.

The S-Cut QE would be more realistic if it was smaller.

Name - M F

Position - Recon Marine

Are you a medic or have prior medical experience (Y/N) - Yes, Paramedic and USMC Combat Med Trained

1. Which tool did you use?

S-Cut 501 & QE, Benchmade Rescue Hook, Trauma Shears

2. How do you feel the tool performed?

S-Cut 501 & QE tools were undoubtedly the quickest & smoothest

3. If you used multiple tools which ones were they, and share your opinion regarding which performed the best and why?

Shears & hook had to be swapped out, as expected. S-Cut tools were not. However, the S-Cut tools are too bulky

4. Did you feel comfortable using the tool or tools?

Most comfortable using the S-Cut tools, felt less likely to cut patient.

Name - Sgt P M

Position - Reconnaissance Man

Are you a medic or have prior medical experience (Y/N) - Prior medical experience

1. Which tool did you use?

S-Cut 501, S-Cut QE, Benchmade, shears

2. How do you feel the tool performed?

S-Cut 501 & QE – I liked both performed better than the Bechmade & shears.

3. If you used multiple tools which ones were they, and share your opinion regarding which performed the best and why?

S-Cut 501 & QE performed best, were fastest and could cut through anything quickly. Only downfall 501 & QE are a bit big.

Benchmade – (no comment made)

Shears – (no comment made)

4. Did you feel comfortable using the tool or tools?

Yes. If you could scale it down a bit then in my opinion they would be perfect.

It has been shown that the S-Cuts cut much faster and move the patient less during the process of removing clothing for the pose of exposing wounds as fast as possible, in order to treat the wound as fast as possible, thus increasing the chances of patient survivability and safety.

Observations & Comments:

The Tytek 5.5" shears, and the Benchmade rescues cutter had to be replaced at least once during the S-Cut experiment, while only one tool of the S-Cut models was required to finish the four rounds. It would take carrying at least 12 Tytek 5.5" shears to come close to matching the cutting performance of one, six sided, S-Cut 501 blade, before you would have to replace a six sided blade, & hygienic cover that weigh 8.1 grams together. Each Tytek 5.5" shear weighs 36.2 grams, so in order to match the performance of one S-Cut 501 (280 grams), with one 6-sided round blade, you would need to carry twelve Tytek 5.5" shears (36.3g X 12 = 435.6 grams).

The same applies to the Bechmade rescue cutters (50.7 grams each). You would need to carry twelve Benchmade rescue hooks (50.7 g X 12 = 608.4 g) in order to almost match the capability of one S-Cut 501.

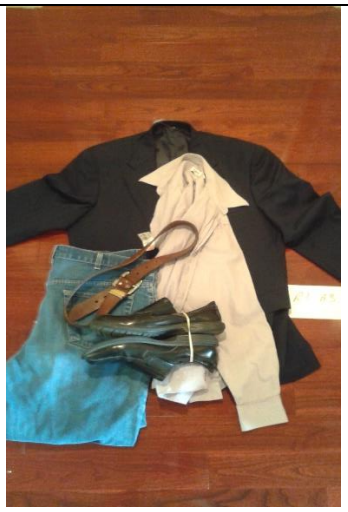
When it comes to the S-Cut QE you would need to carry either 10 Tytek 5.5" shears to almost match the capability of one disposable S-Cut QE (62 g each).

Of all the four tools tested the Tytek 5.5" Shears did the poorest in both time to remove the clothing as well as in the questionnaires. The one comment in favor of the shears is that they could be used for more than removing clothing out in the field. The Benchmade rescue hook came in third place every round regarding time to remove the clothing but it did need to be replaced in order to finish four rounds.

Photo/Graphics (*please keep the file size to a minimum*):

A. Images and materials description of the clothing that was cut during the experiment:

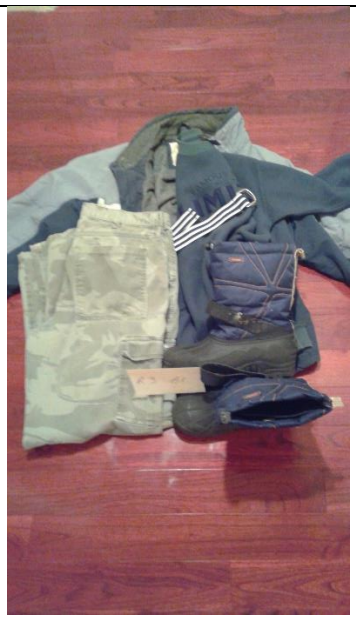
JIFX 17-3 Cutting Tool Experiment Clothing details and images

Sports Coat – 100% wool Button down long sleeve shirt – 100% Cotton Leather Belt – 1.5” Blue Jeans Pair of dress shoes - 100% Leather upper	
Sports Coat – Material label missing Button down long sleeve shirt – 100% Cotton Leather Belt – 1.5” Blue Jeans Pair of dress shoes – Material label missing	

Sports Coat – 100% wool Button down long sleeve shirt – 100% Cotton Leather Belt – 1.5” Blue Jeans Pair of dress shoes - 100% Leather upper	
Sports Coat – 100% wool Button down long sleeve shirt – 100% Cotton Leather Belt – 1.5” Blue Jeans Pair of dress shoes – Material label missing	

Sports Coat – 60% Wool, 40% Polyester Button down long sleeve shirt – 60% Cotton, 40% Polyester Leather Belt – 1.25” Blue Jeans Pair of boots – Material label missing, mixed material	
Sports Coat – Material label missing Button down long sleeve shirt – 60% Cotton, 40% Polyester Leather Belt – 1.25” Blue Jeans Pair of boots – Material label missing, mixed material	

Sports Coat – Material label missing Button down long sleeve shirt – 35% Cotton, 65% Polyester Leather Belt – 1.25” Blue Jeans Pair of boots – Material label missing, mixed material	
Sports Coat – 100% Wool Button down long sleeve shirt – Material label missing Leather Belt – 1.25” Blue Jeans Pair of boots – 100% man made material	

Jacket – Wool & man made material Pullover sweater – 80% Cotton, 20% Polyester Cloth belt 1.5” Pants – 100% Cotton (military style) Boots – Multilayer man made material	
Jacket – 100% Polyester Pullover sweater – 50% Cotton, 50% Polyester Cloth belt 1.5” Pants – 100% Cotton Boots – Multilayer man made material	

Jacket – Mixed Wool, Ramie, cotton, polyester, nylon Pullover sweater – 50% Cotton, 50% Polyester Cloth belt 1.5” Pants – 100% Cotton Boots – Multilayer man made material	
Jacket – 100% Polyester Pullover sweater – 55% Cotton, 45% Polyester Cloth belt 1.5” Pants – 100% Cotton Boots – Multilayer man made material & leather	

Sweater – 30% Cotton, 70% Wool T-Shirt Warm up pants – 80% Cotton, 20% Polyester Tennis shoes – Polyester & Synthetic leather	
Sweater – 30% Cotton, 20% Wool, 45% Acrylic T-Shirt Warm up pants – 100% Polyester Tennis shoes – Mixed material	

Sweater – 70% Cotton, 30% Wool T-Shirt Warm up pants – 55% Cotton, 45% Polyester Tennis shoes – Mixed material	
Sweater – 70% Cotton, 30% Wool T-Shirt Warm up pants – 60% Cotton, 40% Polyester Tennis shoes – Leather upper	

B. Tools used in experiment

S-Cut 501 Replaceable blades and white hygienic covers. Each blade has 6 cutting edges & the tool can be broken down for decontamination. Each tool is individually serial numbered.

S-Cut QE Disposable unit with 5 cutting edges

TyTek Medical Piranha Trauma Shears 5.5” - Black

Strap Cutter, Combat; Benchmade Model 8 Rescue Hook NSN 4240-01-568-3219