Rapid Cutting Video 2 Worksheet

Time; Min, Sec	Visual	Audio	Notes/Comments
	"**AMTEX's Rapid Cutting Project**". Keep same background if possible.		**OPTIMA typestyle** Remove "LBL".
10	***Loose, fashion-illustration style*** *of woman at computer; then another of her holding up new clothes*.	**Scene 1--Introduction** Imagine browsing a computer fashion catalog, then seeing yourself in the **apparel** on the screen. **You place the order through the network and in just a few days**, the finished **garment in your custom style** is delivered to your door.	Remove original illustrations.
25	*Illustration* ***of same woman*** *in a booth being scanned. Later,* ***woman*** *w/garment*.	Envision entering a booth **at** an **apparel retailer**, having your entire body **automatically** scanned and then returning **a few days** later to **try on** a **tailored** garment. **And can you believe that this high, American-quality product you just received is also at off-the-rack prices?**	Remove illustration of man and replace w/same woman from beginning if new drawings of man not already executed. Improve background.
40	Hand cutting and **add Gerber cutter footage**.	Most of the technology to realize these visions already exists, however, the limitations of present cutting techniques such as hand-held electric knives and large production lot, multiple-ply cutters ha**ve** prevented American manufacturers from fulfilling **the goal of quick response apparel manufacturing**.	Shorten hand cutting footage.

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50	**Graphic overlayed onto footage of Byer's automated conveyor**.	**Scene 2--National Lab Resolutions** But Amtex's Rapid Cutting Project is working to resolve these bottlenecks in the manufacturing process.	**OPTIMA typestyle** We should already have this footage.
	Scroll list of AMTEX partners (from poster).	Amtex is a cooperative partnership comprised of scientists and engineers from the National Laboratories and **participating companies from** the textile Industry, whose goal is to bring the manufacturing base back home to the United States.	**Scrolling instead of flat page.** **Change order to**: 1)Industry Research Inst. 2)Offices of DOE 3)Industry Partners 4)National Labs
60		**In a quick response apparel manufacturing line, this rapid cutter would feed single-garment stacks or bundles to a unit production system. This then supplies several sewing lines at a rate that competes with large production lot approaches. With a compact size and reduced cost, this rapid cutter eliminates the need for large cutting rooms and allows a manufacturer to be located closer to the consumer market. The benefits? Reduced delivery time, immediate response to the seasonal market, reduced inventory and retailing costs and over one million apparel manufacturing jobs that stay in the U.S.**	**OPTIMA typestyle**
1:20	***Unit production system and sewing line footage***		J. Caldwell from TC² to obtain for us ***Need Ideas:*** *possible shot of DAMA's roadmap* *Generate a flow chart.*
2:00 2:05	***Scroll Rapid Cutting goals*** **overlayed onto end of Byer clothing conveyor footage**.	The Rapid Cutting **objective** is to provide a **single-ply, single-garment** cutter that will race across the finished textile at more than 200 inches per second **and become the first cornerstone in a quick-**	**All in OPTIMA typestyle** **Scrolling instead of flat page.** See re-write of "Mission"

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		response manufacturing line. Through new technologies in both laser and mechanical cutting, this goal will be reached.	and "Rapid Cutting Goals".
2:20 2:30	"Laser Cutting" **in window with short shot of ANL's CO_2 laser cutter**.	**Scene 3--Laser Cutting** Two principal approaches have emerged as the next-generation textile laser cutter: excimer gas lasers and diode-pumped, solid-state lasers. **Expertise in these technologies comes from experience gained from other Department of Energy programs.**	Remove "LANL" from title; **OPTIMA typestyle** (I believe Sheri may have the tape from ANL.) Cut gas laser animation.
	CO_2 laser cutting footage	**Compared to today's commercially-available continuous-wave, carbon dioxide lasers, (similar to the one shown here) these next-generation lasers may cut cloth perfectly without melting or charring at price breakthroughs that will allow widespread use for both small and large apparel manufacturers.**	
2:50	**Fade in pulsed excimer laser with the words** "Excimer Lasers" (window idea).	At Los Alamos National Lab, several wavelengths of excimer lasers have been tested for the cutting of textiles. **Shown here is a research excimer laser at Los Alamos cutting a single ply of denim. Because of their relatively short wavelengths, this ultra-violet laser light breaks the bonds that hold fibers together. This results in a near-perfect separation or cut. Early results show excellent cut quality. With increases in pulse rate, this laser can be**	
	Scissors Cut and Laser Cut comparison photos.		Photos are from Rapid Cutting brochure.

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	Shot of excimer.	**scaled to 200 inches per second.**	
3:30	**Overlay "Laser Cutting" in window with footage of laser cutting**.	**Scene 4--Laser Cutting** Lawrence Livermore National Lab has **developed** a Diode-Pumped, Solid-State Laser **that melts and ablates natural and synthetic fibers as it cuts.**	Keep excimer shot as-is. Remove "LLNL" from title; **OPTIMA typestyle**
	Slow laser cutting of a square. (at 28:30, end of tape) **Overlay with graphics "LLNL High-Radiance Laser Cutting"** ***Rotating disk and laser beam--best footage*** (from 16:00-21:30 on tape)	**Livermore researchers have conducted cutting tests using diode-pumped, solid-state lasers. This semiconductor device can ablate fibers as it cuts. Low-speed tests seen here have identified the best wavelengths and pulse repitition frequencies for textiles. To simulate 200-inch-per-second laser cutting, a spinning disk of textile was cut with a neodymium--YAG source. These successful proof-of-principle tests have pointed the direction for prototyping efforts for a high-speed cutter and may lead to significant price breakthroughs.**	**New tape from LLNL**.
	Take two different shots of different materials. Use the ones with the least smoke.	**Through laboratory tests conducted at Argonne, Los Alamos and Livermore national labs along with industry partner input, we have found the optimum power levels, wavelengths and pulse shapes for perfect cuts on a large array of apparel textiles.**	
	Overlay "Mechanical Cutting" in window with	**Scene 5--Mechanical Cutting** **For mechanical cutting, Lawrence Berkeley**	Remove footage: (on frame counter: 4.41 to 4.59)

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	footage.		
4:00	**Shortened Pneumatic Cutting footage** *New footage: Electromagnetic motor*.	**National Lab is developing pneumatic and electromagnetic linear motors. These drivers have the advantage of much lighter weight compared to today's copper-wound electric motors. Powerful enough for today's automated, multiple-ply cutting jobs, these high power-to-weight-ratio drivers will allow higher cutting speeds because of their reduced mass. This near-term development effort will benefit today's U.S. cutting equipment manufacturers by reducing the size and cost of multiple-ply cutting heads**.	**OPTIMA typestyle** (on frame counter, use only 5.08 to 5.12--eliminate showing Derek's hands).
	Overlay of wording in window with footage.	**Scene 6--Mechanical Cutting--Special Blade Edges-** **Argonne, Lawrence Berkeley, Los Alamos and Oak Ridge national labs have developed new materials and processes for other D.O.E. programs. Applied to the cutting of textiles, these research technologies can provide near-term benefits to the industry through longer lasting mechanical cutting blades.**	
5:30			**OPTIMA typestyle** ***Need ideas: possibly flash through photos of each lab named? Then more visuals needed after that.***
5:40	**Still photos of blades already sent by Schwarz.**	**Shown here is a scanning electron micrograph of a dull blade. Here is a fresh sharp blade.** For cutting yarn, serrations **or asperities**, rather than smooth edges are effective because they catch the fibers as the blade moves up and down through	Who has these photos?

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		the layers of textile. At high velocity using a reciprocating blade, the fiber is cut immediately upon contact. **At the national labs, analytical models have been developed to optimize the blade design.**	***Need ideas.***
6:10	***Shot of diamond-like, coated blades***.	**Argonne and Lawrence Berkeley have provided diamond-like, coated blades. Oak Ridge has developed intermetallic alloys and Los Alamos is working on amorphous or glass-like materials. Early tests conducted by industry and Los Alamos show significant improvements in blade lifetime and performance.**	Do we have any shots? (from display cases?)
6:30	***Window/wording overlay*** Footage of pieces being pulled off of table by hand. ***Footage of hand sorting from Byer (shows 2 guys pulling pieces off of a Gerber cutter).***	**Scene 7--Material Handling** What happens to the numerous pattern pieces as they are formed by the cutter? Manual sorting techniques, shown here, keep pace with **today's** cutters. But **next-generation**, high-speed cutters can produce up to 25 cut pieces per second **to feed several unit production sewing lines**. An automated **high-speed, single-garment**, picking and sorting system is mandatory. At Sandia National Lab, this system is being developed **based on their expertise in remote handling robotics and low-cost solutions required by industry.**	Remove "SNL" from title. **OPTIMA typestyle** ***Need ideas.***

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	Illustrations of system.	**In one concept**, cut pieces pass under several picking stations without disturbing neighboring pieces. Grippers grab them before they fall, then carry the cut pieces in proper order to **unit production system** racks and modular sewing lines. The system will keep pace with the rapid cutter processing fabric at 1 foot per second. Its flexibility, small size and nominal cost make it an attractive concept to coordinate with the Rapid Cutting environment.	We have two still illustrations. ***One needs larger pattern pieces, spaced farther apart and we need one additional picture showing grippers and pieces being transported.*** ***Need ideas.***
7:30	***Video montage of previous elements.***	**Final--Rousing Close** Thanks to these striking **developing technologies from the national labs teamed with the manufacturing expertise of the industry partners, U.S. apparel manufacturers can move to a higher technical plateau with next-generation, fast, accurate and inexpensive single-ply, single-garment cutters.**	OR ***other ideas. Possibly, animation of turning, red textile magically being cut and dissolving into complete culotte that was shown on the woman earlier.***
8:00	***Loose, fashion-style illustration, as in beginning, of same woman wearing the culotte. This dissolves into a real woman wearing the item***	**This enabling technology applied to a quick response manufacturing architecture can revolutionize apparel manufacturing and make** what you can only now imagine...a reality.	Remove other footage and graphic placeholder from existing ending.

Time; Min, Sec	Visual	Audio	Notes/Comments
		Credits	Cut "This Production was made poss..." and the Labs.
		Written By: Paula Barker Sheri Brenner **Craig Fong**	**Run footage in background of credits.** **All in OPTIMA typestyle**
		Edited and Produced By: Sheri Brenner Lawrence Berkeley **National** Laboratory Video Services Group	**add "Craig Fong"**
		Associate Producer: Paula Barker Project Assistant	
		Animation/Graphics: Flavio Robles, Jr. Lawrence Berkeley **National** Laboratory Illustration Group	**insert "National"**
		Prepared as an account of work sponsored by the United States Government. **While this film is believed to contain correct information, neither the United States Government nor any agency thereof**, nor the Regents of the University of California, nor any of their employees, makes any	Cut "Technical Consultation by..." and individuals' names. **This highlighted section was left out of the original disclamer.**

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8:45			