

Next-Generation Splicers — How Enhanced Cleaver and Splicer Functionality via Bluetooth® Produces Monetary Savings

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Bluetooth Enhanced Accessory Management

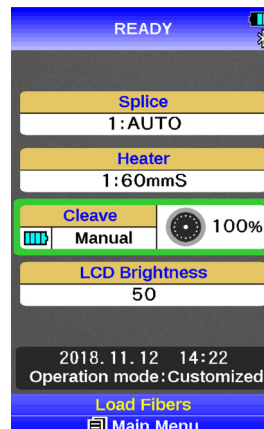
Bluetooth communication is not a new technology, as many of our smart devices and computers have been Bluetooth compatible for years. However, in the splicing world, Fujikura is the first to use this technology in a way that translates to true monetary savings.



Maximum Cleaver Life

In previous generation cleavers, cleaver blade management was an impossible task. For these cleavers, remembering which positions are worn and which are still viable is far too time consuming to track. As a result of blade mismanagement, AFL's experience suggests cleavers sent in for blade replacement only have **60-70%** of their positions worn, meaning cleavers are being sent in for maintenance nearly twice as often as actually needed. That translates to unnecessary down time, increased service costs, and additional hassle.

All of these issues are eliminated when technology does the work for you. Fujikura's Bluetooth enabled splicers – 90R, 90S, 70R+, 70S+, 62S+, 19S+, and 41S – manage your cleaver blade by monitoring cleave quality of the current blade position. When the fiber image on the splicer screen shows repeatedly bad cleaves, this indicates a position's end of life. At which point, the splicer sends a Bluetooth signal to have the cleaver rotate its blade to the next viable position with its internal step motor. The images above show the latest "Ready" screen and "Blade Management" table as seen in the splicer. The "Ready" screen provides a quick snapshot of your cleaver's remaining blade life, while the table keeps record of which positions are worn and which are still usable, indicated by the grey and white shading respectively. These features ensure you're getting the full value out of every cleaver blade.



Blade Management			
No.	Blade Height		
	Low	Middle	High
1	1220	1453	0
2	1033	1157	0
3	844	1640	0
4	1145	1969	0
5	1193	1461	0
6	1993	1400	0
7	1898	1233	0
8	793	1130	0
9	854	1677	0
10	1180	1130	0
11	1911	453	0
12	841	0	0
13	1887	0	0
14	1483	0	0
15	1369	0	0
16	1369	0	0

Splicing Rework Reduction

When starting the splicing process, the splicer assesses the cleave quality by analyzing the fiber images as seen on-screen. If the cleave quality does not meet the expected cleave quality for cleave angle and cleave shape criteria, a cleave error alarm will occur. When a cleaver blade position is near its end of life, cleave quality approaches this alarm threshold with greater frequency. Also, the shape of the cleaved fiber end may become more irregular. Therefore, in some cases, there may be a defect in the cleave shape or quality that cannot be detected by the side-view image of the splicer, but that is nonetheless of sufficient severity to affect splice loss. In this case of a fiber with an undetected cleave imperfection, the splice will be completed with no cleave error message, and this may result in a poor quality splice.

Most operators will not rotate the cleaver blade to a new position until several cleave error alarms have occurred, and the cleave alarms have become a sufficient nuisance that the operator is willing to interrupt splicing operations to rotate the cleaver blade. If the splicing operations are time critical and there is a deadline for completing splicing, the operator may tolerate a large number of poor cleaves and cleave alarms in order to get the job done as quickly as possible. By the time the operator interrupts splicing activities long enough to manually rotate the cleaver blade, many poor cleaves (detected or undetected) may have contributed to higher splice loss, leading to future splicing rework.

With Bluetooth management, the splicer tracks and recognizes cleave quality degradation more quickly than a human operator. In addition, the worn blade recognition capability is used to automatically rotate the cleaver blade to a new position, and this can happen without any interruption to splicing operations. This recognition and tracking of cleaving performance degradation was developed by Fujikura and has been programmed into this new generation of splicing equipment. The automated management of cleave degradation tracking and corrective cleaver blade rotation significantly reduces splicing of poorly prepped fibers, and therefore reduces splicing rework by up to 80% by Fujikura calculations. The minimization of rework offers savings in time, labor, and opportunity costs previously impossible with traditional splicer and cleaver technology.

Increased Operator Efficiency

With traditional field cleavers, rotating to a worn or damaged blade position is a common mistake. Also, before an operator realizes their current blade position is expended, several bad consecutive cleaves have been made. Sum these instances several times for a cleaver life of 60,000 single fiber cleaves and you have significant valuable time wasted. As a result of operator-free blade management, the cleaver will never rotate to a bad position, and will rotate before the operator wastes time with several bad fiber preps. Both of which completely reclaim the time lost to these previously common occurrences.

In addition, what used to be a 3-5 min. process to rotate the blade manually, is now achieved in seconds with no tools or disassembly required. This corresponds to hours of time saved in the course of a cleaver's blade life, meaning technicians spend more time splicing and less time performing maintenance.

The Cutting-Edge Cleaver

The CT50 is miles ahead of its predecessor. With Bluetooth communication, improved field maintenance, simplified ergonomics, and unmatched robustness, this cleaver minimizes fiber prep complexity and equipment upkeep like never before.

Maintenance Simplified

Sending your cleaver in for maintenance is few and far between with this product. A cleaver's blade, fiber clamps, and anvil are the most frequent replacement items when sent in to our service team for repair. All of these items are now field replaceable with the CT50, eliminating paying for AFL technician labor, shipping, and lost opportunity costs.

More specifically, the blade is the most frequently consumed item in the tool. Behind the blade, fiber clamp pads are the next most common replacement items in a cleaver. The cost for these two repairs with labor included are \$242.50 for the blade replacement



and \$262 when only two clamp pads are considered. If all four pads, a blade, and an anvil need replaced, the repair is nearly \$700. These costs do not include shipping or monetary loss incurred from equipment down-time. This process also takes between 3-4 days when shipping to and from is included.

With the CT50, these two repairs are \$92.50 and \$111 respectively. In addition, the time for these repairs are reduced to an hour maximum if you keep a small stock of these consumables. That's an average **60%** cost reduction for the most common repairs required for any cleaver..

Ergonomic Operation

While not as easy to translate to a dollar value, the peace of mind provided by a controlled, repeatable blade rotation and height change is still noteworthy. Traditional cleavers require a manual and cumbersome process that left many users nervous about the quality of their rotation or height change. With the CT50, rotation is achieved with a simple push button, utilizing motorized rotation. While the height change is accomplished by turning a simple thumb-wheel on the front of the cleaver. These ergonomic improvements increase reliability of and remove operator error from these crucial processes.

Hidden Costs Reduction

The tables below provide quantifiable explanations of the multiple cost savings and value add statements mentioned through this document. Several generalizations are made for calculating costs:

- 1) 100 splices/day for an average splicer technician
- 2) \$50/hr. business rate for a splicer technician
- 3) CT30—pair of pads replaced every other blade. CT50—all pads replaced with every blade.
- 4) Blade/Clamp Pad replacements from accidental damage are not considered for simplicity.

COST OF OWNERSHIP OVER 5 YEARS		
	TRADITIONAL	BLUETOOTH ENABLED
Cleave Life	48,000	60,000
% Life Used per Blade	60	100
# of Blade Replacements	8	4
Clamp/Anvil Replacements	~8/3	4
Blade Rotations	144	192
Splicing Rework Occurrences	48	10
Total Cost	\$6,085	\$1,479
Total Time Lost	7 weeks	1.5 days

When you compare the Bluetooth enabled splicer-cleaver combination to a traditional splicer-cleaver combination, you realize a **76% cost of ownership reduction** and **weeks of time reclaimed**. These savings in tandem with the industry-leading **reliability, quality, and support** our products come with make choosing Fujikura Bluetooth enabled splicers an easy decision.



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