

**BRANSON**



## Ultrasonic Rubber Cutting

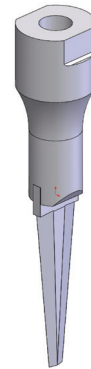
# Ultrasonic Rubber Cutting

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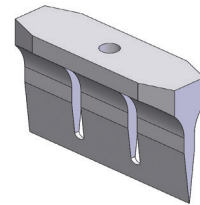
*makes it possible*

For more than thirty years, Branson has been a leader in ultrasonic rubber cutting. Branson's broad capabilities and global presence enable equipment builders and tire manufacturers around the world to quickly and economically adapt to cutting processes in the rubber industry. With technical centers and sales support centers worldwide, Branson is always close by, ready to understand and fulfill the needs of its customers when requested.

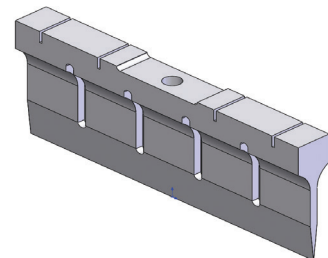
With ultrasonic cutting, Branson's application knowledge and expertise are unsurpassed, specifically with its ability to utilize Finite Element Analysis (FEA) by skilled engineers to analyze the most critical of factors during the acoustical tooling development process. Branson has a long history of being a partner with tire manufacturers and tire machine builders. Some of these partnerships have pushed the boundaries of our technology, to what was once uncommon is now an everyday cutting system.



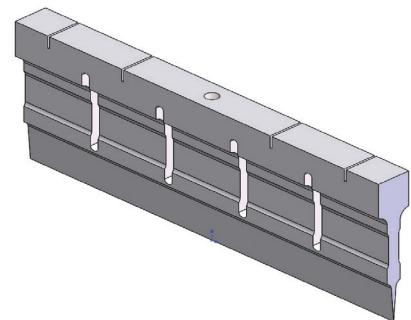
40kHz Stiletto Cutting Horn



40kHz Cutting Horn



30kHz Cutting Horn



20kHz Cutting Horn

## Benefits of Branson Ultrasonic Rubber Cutting

- **Very high precision cutting** — the cuts are smooth, clear, and clean.
- **Repeatable cutting** — the blade output is monitored by a closed loop electrical circuit to provide consistent cuts time after time.
- **Cool temperature** — little heat is imparted to the rubber.
- **Dry** — no lubrication is needed since the vibrating cutting tool passes smoothly through the rubber, while ultrasonically vibrating at 20,000 to 40,000 cycles per second, depending on the application.
- **Low energy consumption** — the vibrating cutting horn is only activated when cutting, yielding approximately 100 watts or less during a typical thin material application.
- **Ease of integration into automation** — the ultrasonic rubber cutting process is simple enough to upgrade into existing machinery or implement into new machinery.

## The Four-Part Ultrasonic Rubber Cutting System

- **Power Supply** — also called the generator. Converts 50/60Hz AC electric voltage into high-frequency electrical energy. Depending on the application, frequencies can be 20kHz to 40kHz.
- **Converter** — an electro-mechanical device that receives the electrical energy from the power supply and converts it into high-frequency mechanical vibrations.
- **Booster** — sits between the converter and horn (blade). Provides rigidity to the stack and controls the amplitude (range of motion) of the cutting horn.
- **Cutting Horn** — also referred to as the blade horn. A wide array of configurations are available, each custom engineered for the specific application to ensure exacting, long-term performance.

With typical ultrasonic rubber cutting applications, the angle of the blade horn, thickness and type of rubber, and the style of cut ultimately affect the cutting speed. Two main styles of cut are prevalent—plunge and traverse.

Branson has been able to achieve low skive angles in numerous applications with a variety of blade horns. Several 40kHz examples of blade horns are listed below, but depending on the application, Branson can tailor a solution to meet the most demanding of customer needs.

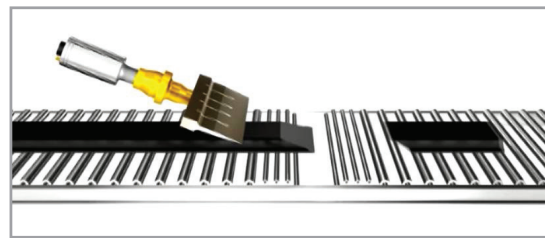
## Half Wave Blade Horns for Ultrasonic Rubber Cutting

	Length	Material	Coating (optional)	EDP No.	Booster
40kHz	3.25" (82.5 mm)	Titanium	TiN		Green
40kHz stiletto	2.5" (63.5 mm)	Titanium	TiN		Green
30kHz	7" (180 mm)	Titanium	TiN		Green
30kHz	4.33" (110 mm)	Titanium	TiN		Green
30kHz stiletto	3.5" (90 mm)	Titanium	TiN		Green
20kHz	5" (127 mm)	Titanium	TiN		Green
20kHz	10" (254 mm)	Titanium	TiN		Green
20kHz	12" (305 mm)	Titanium	TiN		Green

\*TiN - Titanium Nitride



Traverse Cut



Plunge Cut

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