


OX
TALMAX™

4 1/2"
x .05" x 7/8"
115 x 1.2 x 22.2mm
TYPE 1 / TIPO 1

JTS
WHEEL LIFE

PM MAX
921

POINTE DE DIAMANT

DIAMOND EDGE

DIAMOND DESIGN

A three-year research project results in a first-of-its-kind diamond-tipped wheel for cutting metal

by Jimmy Myers, senior editor



The resin-bonded abrasive wheel has for years been the go-to source for fabricators cutting metal. Researchers at Lenox believe they are about to change that, however, with their new steel-bodied, diamond-tipped wheel.

Matt Lacroix, director of marketing at Lenox, Newell Brands, notes that it took many years for masonry workers to adopt diamond-tipped wheels to cut concrete, which is now the norm in that field. However, he believes that slow adoption rates won't be the case with MetalMax diamond-tipped wheels. Rather, after three years of research, the wheel is something machine shops, metal fabricators, welding shops and service centers will quickly gravitate to.

"We're not looking for small increments of growth," Lacroix says. "We're looking to completely overhaul metalcutting capability. The advancement in cutting performance and operator safety should drive immediate change."

That change will be seen in a wide range of cutting applications. MetalMax wheels are for use on die grinders and angle grinders as well as circular saws, pull-down chop saws and gas-powered saws. MetalMax wheels range in size from 1.5 in. to 14 in. in diameter.

RELEASING RESIN

Resin-bonded abrasive wheels are the metalcutting norm, especially with angle and die grinders. These types of wheels are inexpensive and bought by the hundreds on big job sites, but offer little in terms of productivity. They break easily, wear down with every rotation and can cause injuries.

"You start making a few cuts and the diameter of the wheel just continues to shrink until you can't cut anymore," Lacroix says. "They wear out extremely fast, forcing the operator to change wheels frequently, sometimes several times a day."

Most resin-bonded wheels can also be snapped with a bare hand, which is

even more of an issue in a grinder that operates at high RPMs.

"If the wheel gets caught in the material and the operator bends it a little bit to try to free it up, those wheels can snap just like that," Lacroix explains with a snap of his fingers. "From a safety standpoint, they're extremely dangerous."

When sawing, resin-bonded wheels can also become projectiles if they break while the saw is operating, presenting a danger to the operator and anyone nearby. Additionally, resin-bonded wheels are an environmental hazard – giving off a "considerable amount of odor and debris," Lacroix says.

THE DIAMOND SOLUTION

Attaching diamonds to wheels and blades is nothing new, Lacroix notes, but the temperatures generated by the friction when cutting masonry pales in comparison to that of cutting metal. The issue then is creating a

bond that allows the diamonds to stay attached to the wheel despite the high temperatures.

James Malaguez, senior brand manager at Lenox, says the technology to this point has involved non-ferrous metal applications. However, the →



Lenox worked for three years researching how to bond diamonds to the edge of the wheel that wouldn't break off during metalcutting applications. They achieved it with the MetalMax wheel.



Lenox's MetalMax wheel is available in 1.5 in. to 14 in. diameters.

MetalMax wheel represents the first foray into an application for cutting a variety of metals.

"We needed a matrix," Malaguez says, "an element to retain the diamond that is able to withstand the rigors of metalcutting."

The three years of research were spent developing proprietary technology to braze the diamonds on the edge of the wheel. Finally, a team of Lenox engineers and a close unnamed partner "cracked the code."

"It was something we were able to develop," Malaguez says. "We are the first to bring this technology to the market in a big way."

To solve the issue of decreased diameter with every rotation of the wheel, Lenox went with a steel body for the wheel, which doesn't shrink at all during use. Because the steel body maintains its size, the operator can get the full life out of the diamond edge. This translates into much longer cutting life and higher levels of production.

COMING TO MARKET

Metalworkers in a variety of fields began using MetalMax wheels in July, and end user feedback thus far has

been positive, says Malaguez. One hydraulics manufacturer has been using it on 1045 hard-chrome-plated hydraulic cylinder rods. Previously, the only way to get through the chrome plating was to make a precut around the rod to break through the chrome before they could make the cut through the cylinder rods.

"With MetalMax," Malaguez says, "they cruise through that in one pass, one straight cut goes right through the chrome plating and through the rod."

Another example is a fabrication shop owner who has been using MetalMax wheels on stainless pipe. The flexible resin-bonded wheels they were using weren't rigid enough to make straight cuts, which necessitated a secondary operation to make corrections. →

Unlike resin-bonded abrasive wheels that bend, crack and can possibly shatter during use, Lenox's MetalMax wheel is rigid and never loses its diameter.





MetalMax wheels serve as an alternative to abrasive cutoff wheels, offering increased durability as well as smooth, clean and even cuts.



“With MetalMax,” Malaguez says, “he could get a perfectly straight cut and totally eliminate that second grinding operation. We hear stories like that on a daily basis.”

Perhaps the biggest perk realized when adopting the new diamond-tipped wheel is the fact that it has

been rigorously tested and can make a thousand or more cuts, which translates to roughly 30-times the life of a resin-bonded abrasive wheel. The tests revealed average performance for a 4.5-in. wheel in 1-in. carbon steel square tube versus a thin bonded abrasive cutoff wheel.

“We had to do a thousand or more cuts in a number of different materials,” Lacroix says, adding that the claim is backed up on [video](#). The materials MetalMax is built to cut include steel, stainless steel, rebar, sheet metal, non-ferrous and cast iron. However, Malaguez is hearing feedback from end users having success cutting exotic materials, but it’s purely anecdotal at this time as Lenox hasn’t put the wheel through those tests.

TECHNOLOGY CATALYST

Lacroix says the catalyst behind the new wheel is simply part of the Lenox tradition as an innovative brand. The company, which has its roots in metalcutting dating back to 1915, has been delivering superior performance and technologies across a range of products, including bandsaw blades, reciprocating saw blades, hole saws, hacksaws and jig saws.

“That’s really where we make our hay,” Lacroix says. “By delivering advanced cutting products, end users are able to

increase production and efficiencies within their operations. Ultimately, our solutions help them find ways of achieving their cutting goals.”

Lacroix says that in developing MetalMax wheels, Lenox is simply living up to the brand promise, offering superior cutting technology, productivity gains, increased safety and in, this case, even environmental benefits with the reduction of odor and debris.

Malaguez concurs.

“However you look at it,” he says, “there will be incredible benefits over the existing technology today.” ■

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