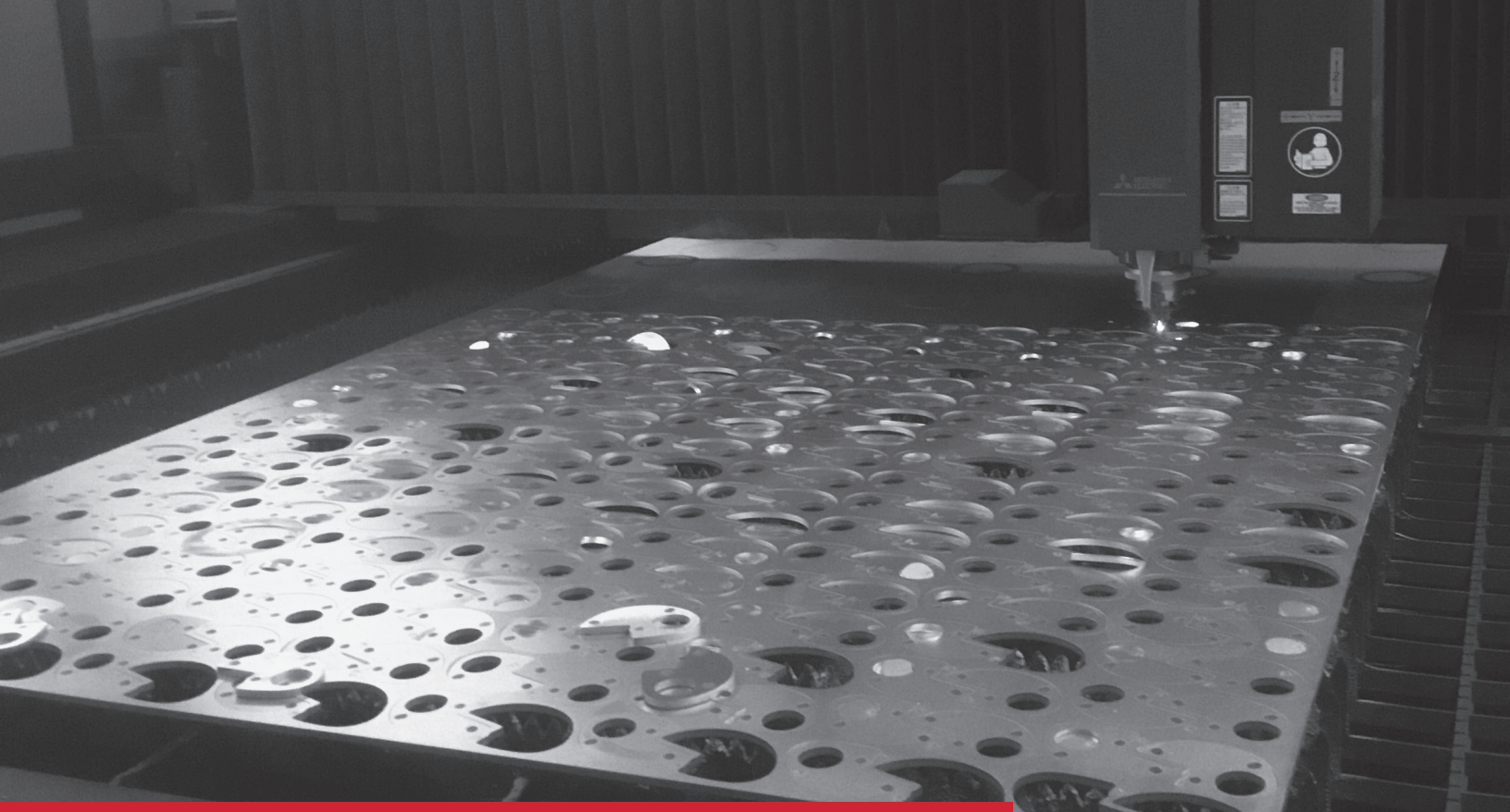


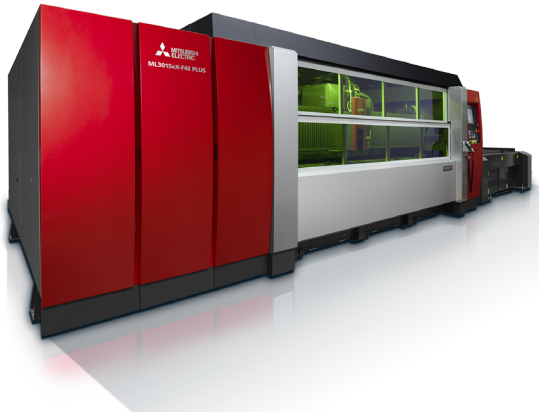
ABR

ADVANCED BURR REDUCTION

What is Blended Gas Technology?

High speed nitrogen cutting remains the big draw of fibers. Although, it can leave a burr as the material gets thicker, as well as requiring a boatload of nitrogen.

Mitsubishi has spent years developing cut conditions for blended assist gas.
The process is called Advanced Burr Reduction or ABR.
The Benefits include:



- Less Burr
- Lower Overall Gas Consumption
- Faster Feed Rates
- Weldable and Paintable Edges (customer experience)
- Less Pierce Spatter

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ADVANCED BURR REDUCTION

Process and Package

In this process, the blender combines a small percentage of oxygen with nitrogen. Several Mits CO2 customers have quietly been using and swearing by ABR on aluminum and galvanized for years. Now, the fiber application range has expanded to carbon steel and stainless as well.

The ABR package includes a blender and cutting data. The cost is really pretty modest, not much more than a nice dedicated air cutting system. The blender runs on 110V and an 02 sensor is the only annual replacement item. With a variable mixing rate of 1 - 25%, it's possible to make your own air for cutting.

Nozzle Gap: in an attempt to reduce nitrogen consumption and increase speed some fiber vendors advocate cutting with the nozzle nearly touching the material. However, such a small gap can lead to crashes and expensive head parts taken out in the process. ABR uses a safe nozzle gap.

Unit Controls

Examples: ABR (blended gas) vs. straight nitrogen. Feedrates may vary depending on the preferred edge, but the comparative difference between the two processes remains about the same.

Success Stories

Model	Material	Thickness	N2 Feedrate	Flow	ABR Feedrate	Flow
6kw eX-F	201 stainless	.060”	1260 ipm	1215 cfh	1400 ipm	565 cfh
6kw eX-F	201 stainless	.105”	320 ipm	1218 cfh	750 ipm	1040 cfh
6kw eX-F	304 stainless	.25”	160 ipm	1395 cfh	200 ipm	750 cfh
6kw eX-F	hrpo	.187”	235 ipm	1825 cfh	320 ipm	1450 cfh
8kw eX-F	hrpo	.105”	800 ipm	1250 cfh	1050 ipm	755 cfh
8kw eX-F	hrpo	.375”	125 ipm	2200 cfh	165 ipm	1305 cfh

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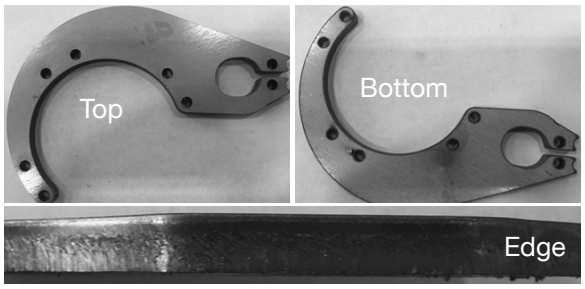
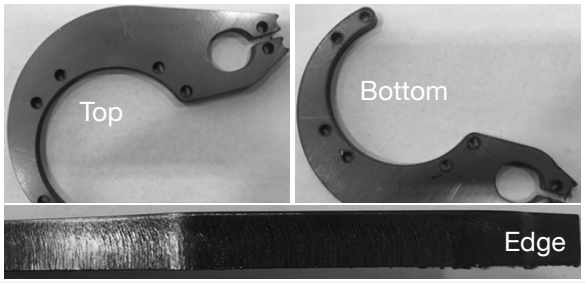


.25” 304 Stainless Steel

- Time to process part: 20 sec
- Feed rate used: 200” / 365”
- Gas flow needed with ABR = 700 SCFH
- Gas Flow with N2 = 1565 SCFH
- Max Speed ABR = 380” Max speed N2 = 225”

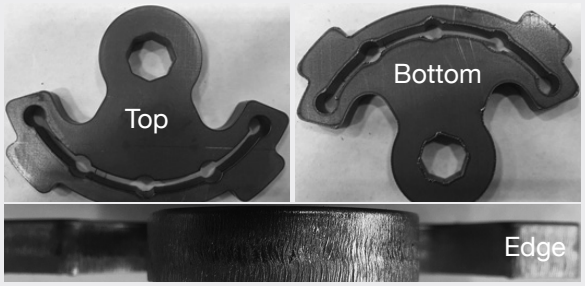
.25” 5052 Aluminum

- Time to process part: 16 sec
- Feed rate used: 150” / 325”
- Gas flow needed with ABR = 1940 SCFH
- Gas Flow with N2 = 1801 SCFH
- Max Speed ABR = 400” Max speed N2 = 325”



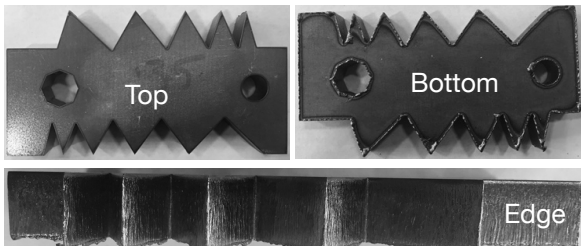
.25” Mild Steel HRPO

- Time to process part: 17 sec
- Feed rate used: 185” / 350”
- Gas flow needed with ABR = 1305 SCFH
- Gas Flow with N2 = 1500 SCFH
- Max Speed ABR = 350” Max speed N2 = 250”



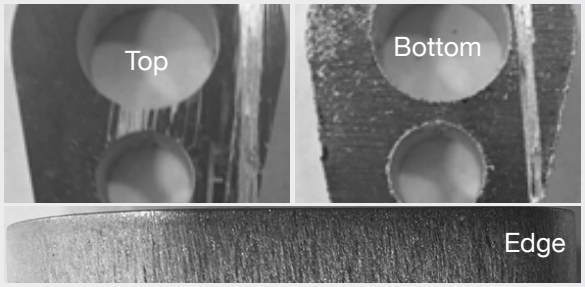
.375” Mild Steel HRPO

- Time to process part: 22 sec
- Feed rate used: 105” / 135” / 165”
- Gas flow needed with ABR = 1305 SCFH
- Gas Flow with N2 = 2200 SCFH
- Max Speed ABR = 165” Max speed N2 = 125”



.5” Mild Steel HRPO

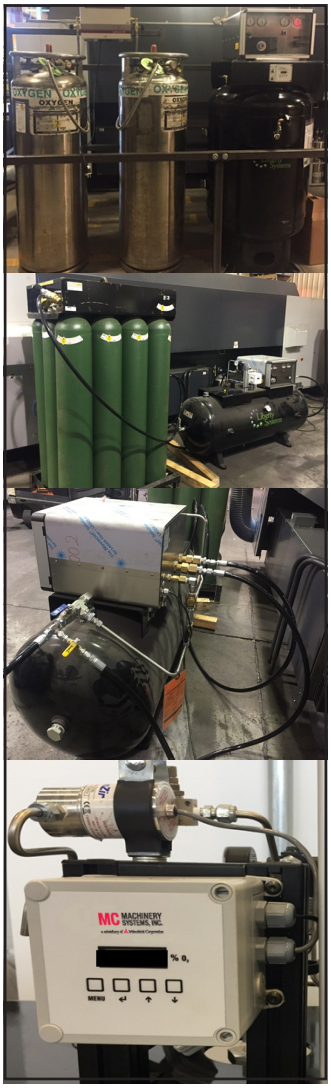
- Time to process part: 20 sec
- Feed rate used: 200” / 365”
- Gas flow needed with ABR = 700 SCFH
- Gas Flow with N2 = 1565 SCFH



Aluminum 5052 .5”

- Time to process part: 20 sec
- Feed rate used: 200” / 365”
- Gas flow needed with ABR = 700 SCFH
- Gas Flow with N2 = 1565 SCFH

ABR
ADVANCED BURR REDUCTION



Gas Supply

Many customers have preexisting gas supplies. Usually, consisting of Bulk O2 and N2. The N2 is around 400 PSI, but the O2 can be considerably lower. If the application needs 400 PSI, a secondary O2 source will need to be provided. This can be accomplished by utilizing high pressure dewars or 12 packs of high pressure cylinders. The rate at which the O2 is used, is considerably lower.

Gas Connections

- 1 connection for O2 source
- 1 connection for N2 source
- This installation connected a line to port 2 and port 3 on the outlet from the unit

Consumables

- The unit is powered by 110VAC
- An O2 sensor is the only expected yearly replacement item

ABR is not for all applications. You need high pressure oxygen when you get into the thicker range, which may require a secondary oxygen source. The percentage of oxygen to the blended gas is nominal, and as the examples show the overall gas reduction can be substantial while leaving a nicer edge. ABR has prompted some fence sitters to pull the trigger on their first fiber.

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