

# The Role of Gas in Precision Laser Cutting across Industries

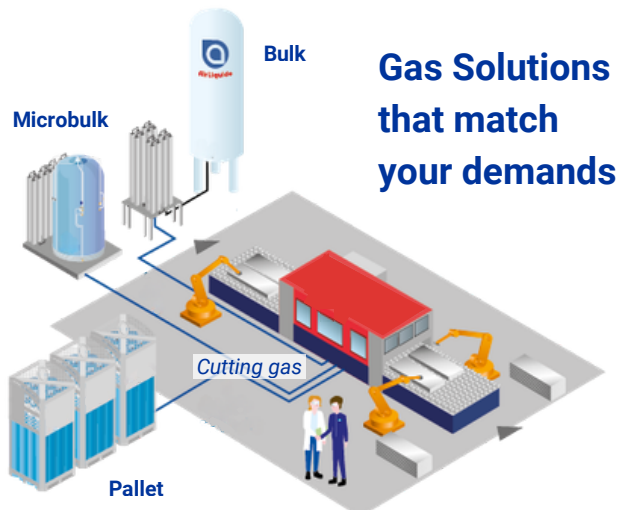
## We deliver:

- ✓ Reliability and performance
- ✓ Uninterrupted beam quality
- ✓ Superior edge finish
- ✓ Significant cost and part savings
- ✓ Increased productivity per hour

## A Manufacturing Revolution

The precision, speed, and versatility of **fibre laser cutting** is driving innovation. Manufacturers expect gas supply to not only match **machine manufacturer specifications**, but also to flexibly scale with their production demands.

The laser equipment is an **expensive and crucial part** of your metal fabrication process. When optimising input materials and parameters, working with our readily available experts is an effective way to boost your operations.



## Considering?

Industrial Manufacturers often raise similar concerns.

### How can I improve my quality and productivity?

High-purity lasing and assist gas help achieve less oxidation and smoother cutting. Our LASAL™ gas solutions ensure stable, surge-free flow that allows you to run your machine at **optimal cutting speed**.

### How do I protect my laser cutting component?

Gas impurity levels strongly influence **component longevity**. Our LASAL™ range exceeds OEM machine manufacturer standards for moisture and hydrocarbon levels, avoiding internal contamination.

### Can I set it and forget it?

Compressed air systems require **regular downtime** during maintenance of dryers, compressors and filters. Air Liquide teams manage maintenance of our gas systems, allowing you to focus on your cutting.

### Do I need a lot of CAPEX to upgrade Air Liquide's gas system if I want an extra laser cutting machine?

It actually requires little to no CAPEX. You can either increase the top-up frequency or switch to a larger tank. We have multiple solutions to suit your needs.

# The 3 Hot Debates of Assist Gas

## #1 Compressed air vs. Nitrogen

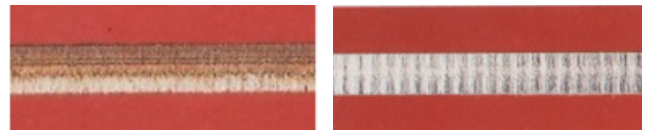
Choosing high purity Nitrogen (N<sub>2</sub>) over compressed air gives **superior edge quality and silverish appearance**.

Features	Compressed Air	High Purity N <sub>2</sub>
Edge Quality (> 5mm)	++ + + + +	+ + + + + +
Cutting Speed	++ + + + +	+ + + + + +
Material Versatility	++ + + + +	+ + + + + +
Laser Component Longevity	++ + + + +	+ + + + + +
Power Savings	+ + + + + +	+ + + + + +
Maintenance	+ + + + + +	+ + + + + +

Note: + + + + + indicates maximum performance

## #2 N<sub>2</sub> and O<sub>2</sub> Gas purity

Air Liquide's pure gases delivers precision cuts, minimal oxidation, and maximum machine efficiency.

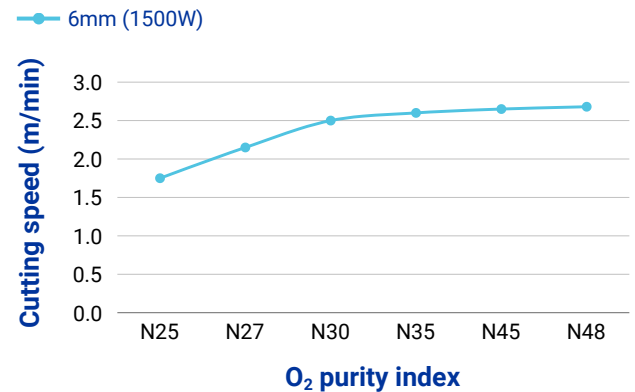


Industrial N<sub>2</sub>

High Purity N<sub>2</sub>

- **Uninterrupted beam quality** with 5N+ (> 99.999%) N<sub>2</sub> gas purity to reduce **oxidation**

## Correlation of O<sub>2</sub> Gas Purity vs. Cutting Speed



- Significantly reduced **cost per part** with O<sub>2</sub>
- Increased **productivity per hour** with O<sub>2</sub>

## #3 Edge quality

### Mild Steel

0.5X-1X: N<sub>2</sub> produces better cutting finish



10mm CS cut by 12kW laser (0.83X) with N<sub>2</sub>



10mm CS cut by 12kW laser (0.83X) with Air

### Stainless Steel

0.5X-2X: Oxidation worsens with thickness



Smooth edge with N<sub>2</sub>



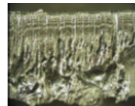
Oxidised appearance with Air

### Aluminium Alloy

Compressed air produces more dross



Cut with N<sub>2</sub>



Cut with Air

## Our customers value...

### High Purity

Air Liquide's LASAL™ range covers high purity lasing and process gases.

#### LASAL™ 2001

Quality-controlled N<sub>2</sub> perfect for cutting stainless steel under high pressure.

#### LASAL™ 2003

Quality-controlled O<sub>2</sub> dedicated to cutting carbon steels. Improves cutting speed by 10-40% with quality cut edges.

Our LASAL™ branded gases, equipment, and services are based on **worldwide standards** in order to be **acknowledged** by international laser manufacturers.



# Supply Modes that Suit Your Operations

Packaging Types	Cylinder	Pallet	Liquid Gas Cylinder (LGC)	Job Site Skid (JSS)	Microbulk	Bulk
						
Reference Monthly Consumption Rate	≤ 500 Nm <sup>3</sup>	≤ 1,000 Nm <sup>3</sup>	≤ 2,000 Nm <sup>3</sup>	≤ 3,000 Nm <sup>3</sup>	≤ 5,000 Nm <sup>3</sup>	≥ 5,000 Nm <sup>3</sup>
Pressure Range	150-300 bar	150-300 bar	5-12 bar	1-30 bar	1-30 bar	1-30 bar

## Air Liquide's Onsite Mixer

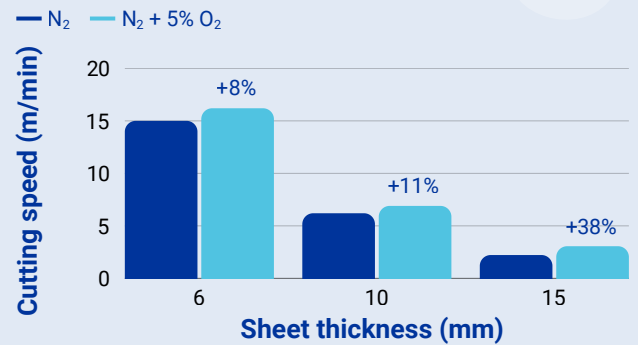


### Aligned with OEM recommendations

Many Machine Manufacturers (OEMs) now specify Nitrogen-Oxygen (N<sub>2</sub>-O<sub>2</sub>) mixes for high-pressure laser cutting to enhance **productivity**.

- ISO 14175 compliant
- No electricity
- No buffer tank
- No Annual Calibration = **No Worries**

### Cutting speed of low alloy steel with N<sub>2</sub>-O<sub>2</sub>



## Auto Changeover for Cylinders and Pallets

### Maximise your throughput

By ensuring a steady, uninterrupted gas supply pressure, you eliminate production downtime during cylinder swaps. This consistent pressure optimises cutting speed and edge quality, significantly reducing scrap. Achieve peak efficiency with a seamless, high-purity gas delivery system built for 24/7 operations.



### Contact us

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