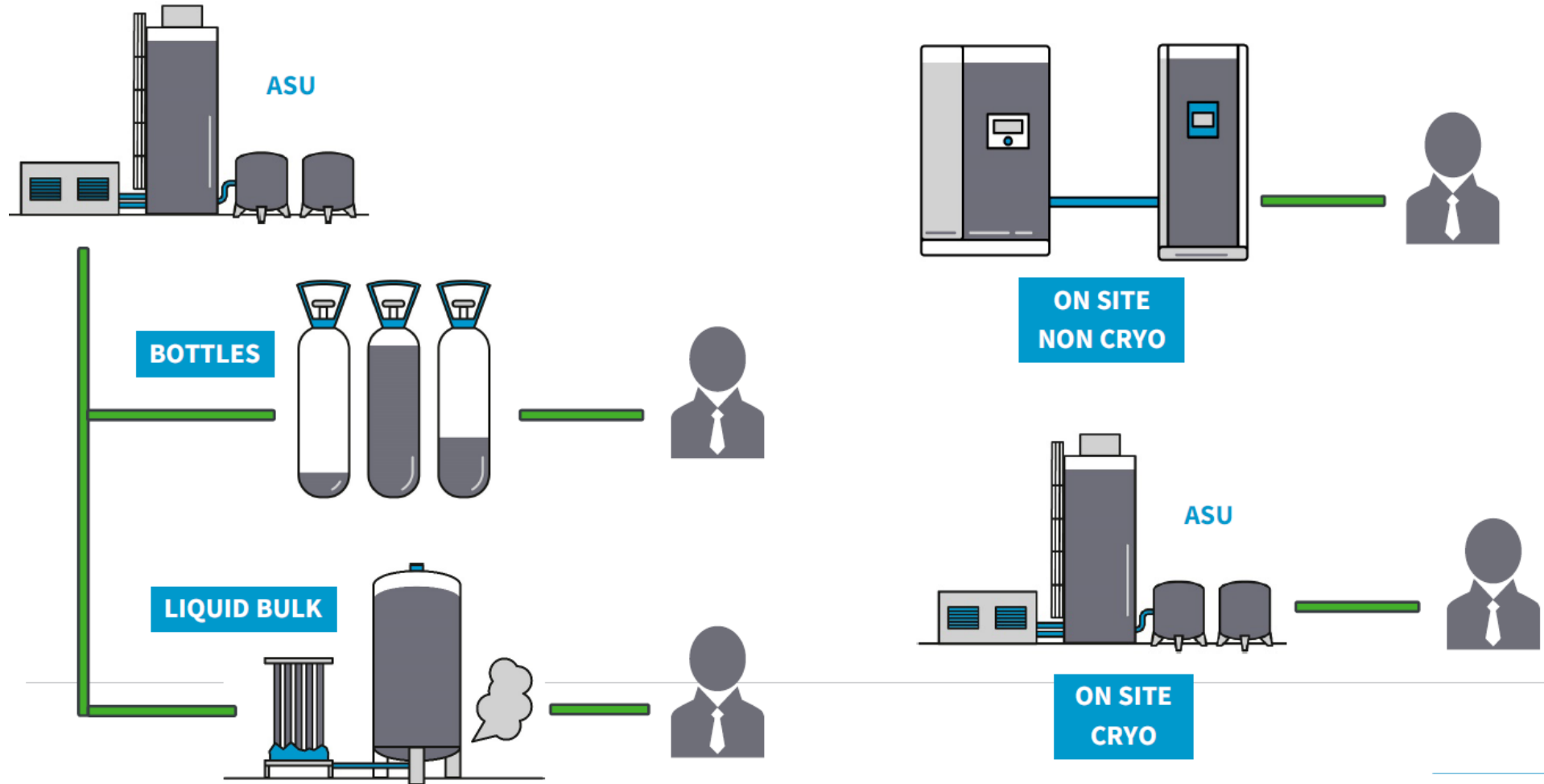


Nitrogen Generation For Laser Cutting

Craig May-Russell



Nitrogen – Supply Options Available



AIR COMPRESSORS
PREMIER DISTRIBUTOR

Air Compressors | Dryers & Filtration | Pipework Installations | Air Energy & Leak Surveys
Consumables, Hose & Fittings | Vacuum Pumps | Nitrogen Generators

ENERGY SAVING SOLUTIONS

Bottled Nitrogen

- High Quality Gas – Not Usually Necessary in Laser Cutting
- High Pressure – Laser Cutting Often Requires 30 Bar plus
- Low Initial Outlay – Simple Install & Setup
- Most Expensive Option of All Available
- High Gas Costs, plus Delivery Costs
- Wasted Gas – Bottles Returned with Gas remaining
 - Often returned with over 30Bar of gas remaining which cannot be used below this pressure



Liquid Nitrogen – Cryogenically Stored

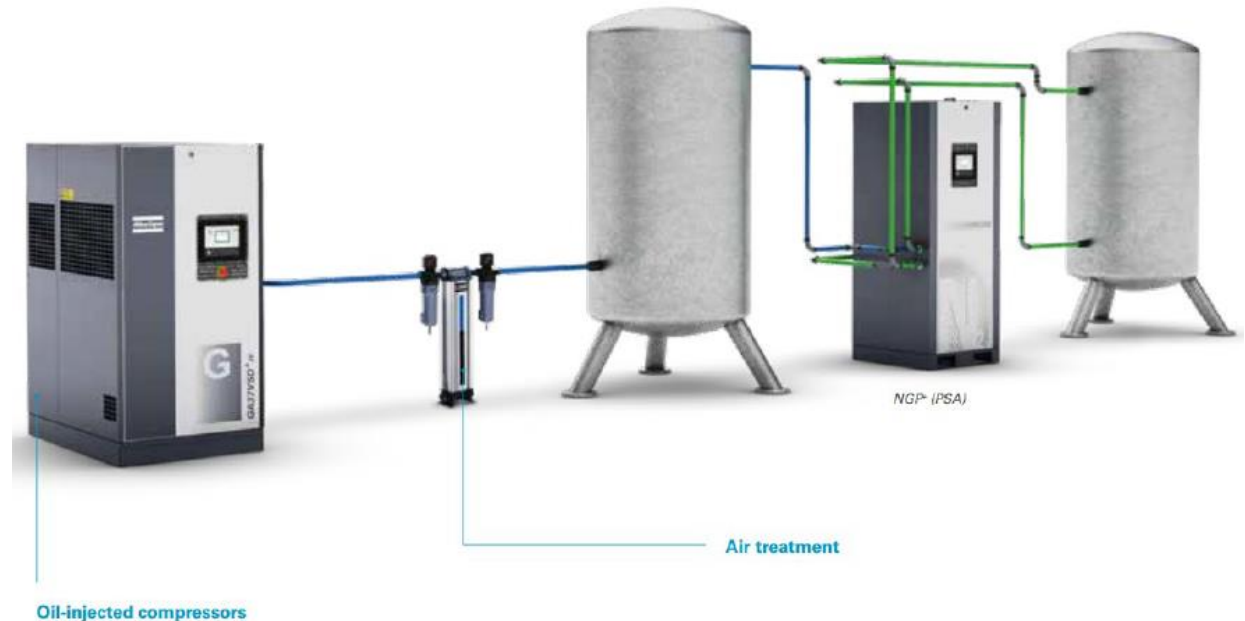
- High Quality Gas
- High Pressure Gas
- Lower Gas Cost Over Bottled Gas
- Expensive Setup Costs
- Long Term Contracts - Often tied into the supplier
- Has 'Boil-Off Losses – Vaporized N2 being released from PSV due to pressure build up
- HGV Delivery – Adding to your Carbon Footprint
- EH&S Risk – Liquid Gas has potential to be very dangerous



Self Generation Nitrogen – How Do We Do It?



- Take Clean & Dryer Compressed Air
 - From a typical compressor & internal fridge dryer @ 3°C PDP
- Remove Contaminants Using a Carbon Tower & Filters
- Store in a Suitable Vessel For a Steady Flow
- Process Through the Nitrogen Generator
 - Removing the Oxygen from the air leaves Nitrogen up to 99.999% Purity
 - The lower the acceptable purity, the lower the cost of equipment & generation costs
- Store For Use in a Suitable Vessel
- For Higher Pressure Nitrogen -We simply add a Booster (40 or 300 Bar)

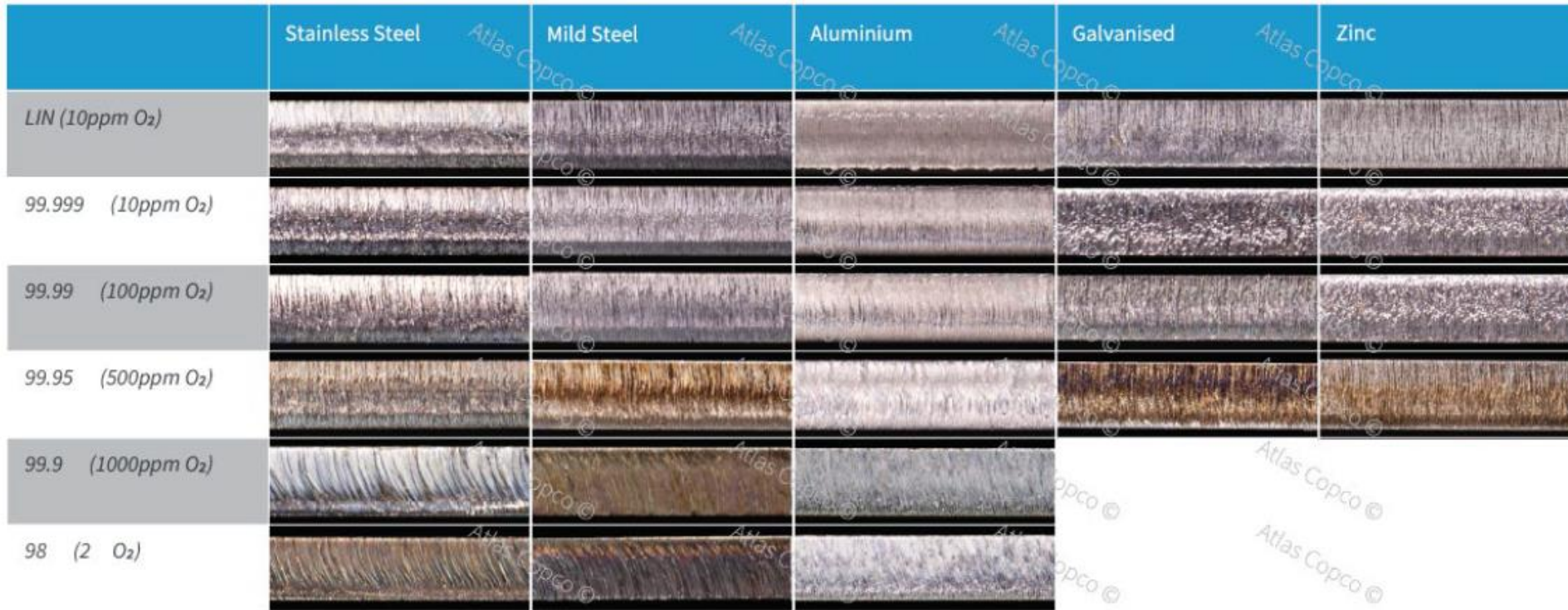


AIR COMPRESSORS
PREMIER DISTRIBUTOR

Air Compressors | Dryers & Filtration | Pipework Installations | Air Energy & Leak Surveys
Consumables, Hose & Fittings | Vacuum Pumps | Nitrogen Generators

ENERGY SAVING SOLUTIONS

Nitrogen Purity for Laser Cutting



Typical Purity ←

This picture table shows the cutting edge result for 3mm parts, cut with different gas purity. The N₂ purities mentioned refer to inert gas purities. Laser parameters (e.g. cutting speed) can have minor impact on these test results.

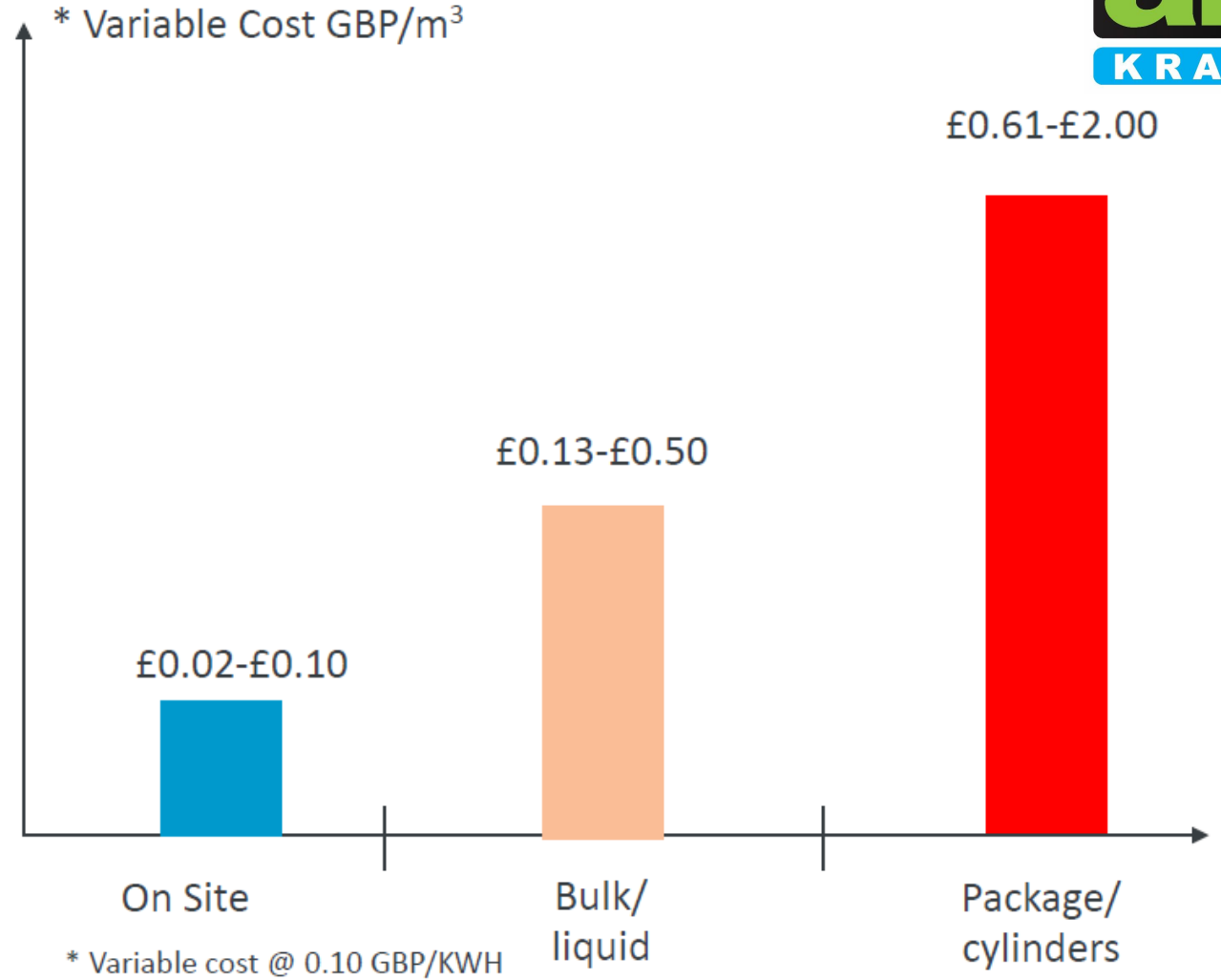
	Stainless Steel	Mild Steel	Aluminium	Galvanised	Galvanised
1mm	99.9 (1000ppm O ₂)	99.9 (1000ppm O ₂)	98 (2 O ₂)	99.95 (500ppm O ₂)	99.95 (500ppm O ₂)
3mm	99.99 (100ppm O ₂)	99.99 (100ppm O ₂)	98 (2 O ₂)	99.99 (100ppm O ₂)	99.99 (100ppm O ₂)
5mm	99.99 (100ppm O ₂)	99.99 (100ppm O ₂)	98 (2 O ₂)	n/a	n/a

This table shows the lowest gas purity for which no difference with liquid N₂ can be observed yet. The N₂ purities mentioned refer to inert gas purities. Laser parameters (e.g. cutting speed) can have minor impact on these test results.

How Much Do The Different Options Cost?



- Ask us for a specific cost calculation for your site info@airkraft.co.uk
- Cost of Buying Nitrogen – Per Meter Cubed



AIR COMPRESSORS
PREMIER DISTRIBUTOR

Air Compressors | Dryers & Filtration | Pipework Installations | Air Energy & Leak Surveys
Consumables, Hose & Fittings | Vacuum Pumps | Nitrogen Generators

ENERGY SAVING SOLUTIONS

Will It Really Work?

- Example
- Customer in the South West Using N2 Cutting With Two Bystronic Fiber Lasers
- High Volume Production
- Using Atlas Copco Skid 8 'Container Package'
- Gas Generated – 42 Nm³/h with 480 Nm³ of Storage @ 99.99% Purity
- Saving £2,500 p/month vs Bulk Nitrogen
- Ask us for a specific cost calculation for your site info@airkraft.co.uk



Try Before You Buy...

NGP⁺ nitrogen generator

- Automatically regulates requested nitrogen pressure and purity
- Self-protective monitoring of the feed air temperature, pressure and dew point
- High-quality absorbent
- Automatic, fast start-up eliminates risk of overflow and absorbent damage
- Stand-by mode for energy savings

Nitrogen storage

(40-bar receiver or 300-bar cylinders)

GA VSD⁺ compressor

- VSD⁺ Permanent Magnet motor reduces energy use on average 50%
- Upright design with small footprint
- Few components for an increased uptime
- Direct drive with fewer parts, no gears or belts, no shaft seal

Nitrogen booster

(40 or 300 bar)

Take Up The **Try Before You Buy Offer !**

Take An Atlas Copco Skid Package
On Try Before You Buy

Request Details info@airkraft.co.uk