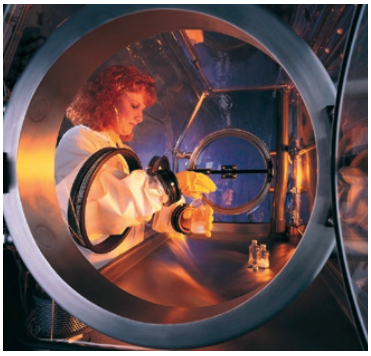
BIP® Technology: the highest purity gases consistently

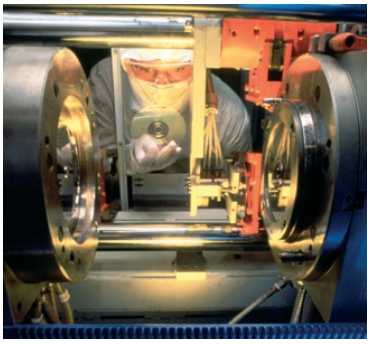
BIP® gases for high-technology welding



BIP® gases for glove boxes

"We dramatically improved the performance of our glove boxes with increased lifetime of the catalyst and reduced regeneration downtime. We wouldn't recommend anything other than BIP® cylinder technology and its very low levels of H_2O and O_2."

Arend Kooi.
Sales manager MBRAUN Glove Boxes, BFI OPTILAS B.V., The Netherlands



BIP® gases for CD/ DVD production

Minimum impurity for maximum peace of mind

In a competitive and regulated market, industries are under constant pressure to increase productivity, optimize their process and improve quality while minimizing pollution and costs. Legislation and tough competition have resulted in increased demand for ever more accurate and reliable analyses of a wide range of complex chemical compounds.
Just think: with less impurities in the gases you use, you're bound to have a head start in the race.

Make the most of the BIP® technological breakthrough; BIP® gases have impurity levels as low as 10ppb total hydrocarbons,10ppb oxygen and 20ppb moisture, meaning BIP® gases deliver the lowest level of impurities available anywhere. BIP® gases have become the analytical standard for all applications requiring high purity gases with consistently low levels of impurities: gas chromatography, inerting, high quality welding and many others.

BIP® gases for analytical applications

BIP® technology for high-tech applications

Specialist analytical and industrial applications require an assurance of gas purity at the point of use.

BIP® gases guarantee you the highest levels of purity. Ultra low impurity levels secure the accuracy of your results, giving you peace of mind so you are free to concentrate on your business.

- Purity
- Accuracy
- Stability
- Peace of mind
- Consistency
- Convenience
- Cost savings
- Performance enhancement

"In our business, we cannot afford any production stops…with BIP® technology we now have an insurance on product consistency for each single cylinder we use, from the first to the last molecule."

Willem van Wijk,
Production Manager from Alcontrol Laboratories BV Nederland.

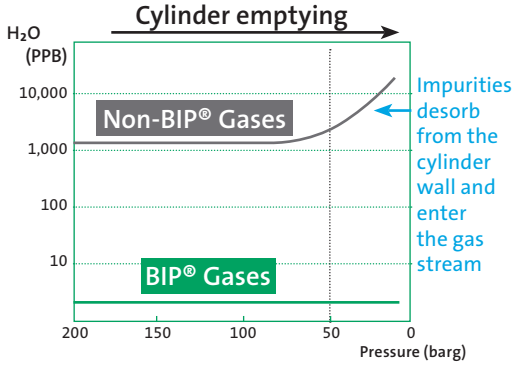
BIP® technology means failsafe analyses for all GC users

Since BIP® gases have impurity levels as low as 10ppb total hydrocarbons, 10ppb of oxygen and 20ppb of water, every gas cylinder fitted with BIP® technology gives GC users the benefit of an improved baseline, better peak separation, lower detection limits and greater sensitivity. All this in addition to greater lifetime for columns and detectors and minimal maintenance. BIP® gas is the ultimate zero-defect gas.

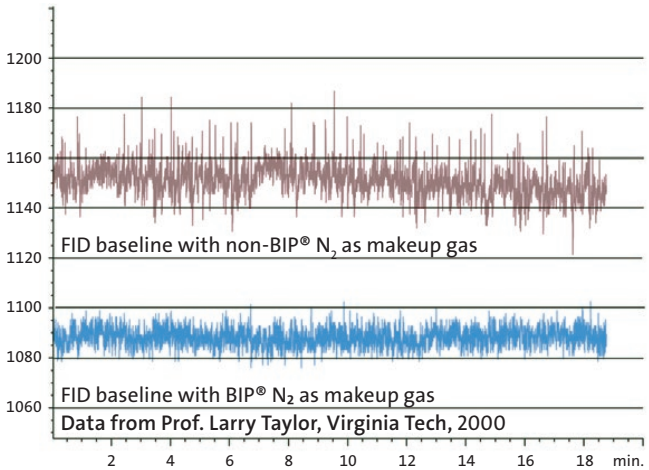
- Better analytical results

BIP® gases – Cost savings : more usable gas

The Water (H_2O) concentration in BIP® product gas remains constant as pressure in cylinder decreases. So, more usable gas per cylinder producing cost savings



BIP® gases – Performance with GC-FID



You want purity, we've got it

The BIP® purification technology, designed by Air Products, enables you to use argon, nitrogen, hydrogen and helium that are up to 300 times purer than normal cylinder gases.

Experis® gases with BIP® technology are available in three grades, featuring impurities as low as <10 ppb total hydrocarbons, 10ppb oxygen and less than 20 ppb moisture.

Gas	Helium			Nitrogen			Hydrogen		Argon	
Grade	**BIP**	**BIP ECD**	**BIP Plus**	**BIP**	**BIP ECD**	**BIP Plus**	**BIP**	**BIP Plus**	**BIP**	**BIP Plus**
O_2	< 10 ppb	< 10 ppb	< 10 ppb	< 10 ppb	< 10 ppb	< 10 ppb	< 100 ppb	< 100 ppb	< 10 ppb	< 10 ppb
H_2O	<20 ppb	< 20 ppb	< 20 ppb	< 20 ppb	<20 ppb	<20 ppb	< 20 ppb	< 20 ppb	< 20 ppb	< 20 ppb
THC*	< 100 ppb	< 100 ppb	< 50 ppb	< 100 ppb	< 100 ppb	< 50 ppb	< 10 ppb	< 10 ppb	< 100 ppb	< 50 ppb
$CO+CO_2$	< 0.1 ppm	< 0.1 ppm	< 50 ppb	< 0.5 ppm	< 0.5 ppm	< 50 ppb	< 0.1 ppm	< 50 ppb	< 100 ppb	< 50 ppb
H_2	–	–	< 100 ppb	< 0.2 ppm	< 0.2 ppm	< 50 ppb	–	–	–	–
CFC**	–	< 1 ppb	–	–	< 1 ppb	–	–	–	–	–
N_2	< 1 ppm	< 1 ppm	< 100 ppb	–	–	–	< 1 ppm	< 0.2 ppm	< 1 ppm	< 0.3 ppm
NO_x	–	–	–	< 100 ppb	–	< 20 ppb	–	–	–	–
SO_2	–	–	–	–	–	< 20 ppb	–	–	–	–
Certification of conformity	Batch	Batch	Individual	Batch	Batch	Individual	Batch	Individual	Batch	Individual

** THC = as CH_4*
*** CFC = halocarbons*

"The slightest contamination could compromise our isotope measurements or damage our equipment. BIP® technology has enabled us to balance our technical demands with cost constraints."

Cyril GIRARDIN, Engineer, INRA, France

A range of shapes and sizes to suit every need

From Mini to Maxi packages, Experis® gases with BIP® technology are available in three container sizes:

- Mini BIP® cylinder: a 10 litre cylinder that is light and easy to carry thanks to the valve guard handle
- The traditional 47 litre BIP® cylinder
- BIP® cylinder pack: a 12x50 litre pack
- Maxi BIP® cylinder pack: a 300 bar 18x50 litre pack with greater storage capacity for high consumption applications

A suitable size whatever the gas requirement

Pure genius, from the inside out

The revolutionary BIP® technology system is a self-contained purification system consisting of a specially designed valve and purifier bed. The BIP® system purifies gas at high pressure to achieve lower levels of impurities just before it leaves the cylinder.

- Lowest levels of impurity guaranteed
- As low as <10 ppb total hydrocarbons, < 10 ppb O_2 and < 20 ppb H_2O
- No more hassle and cost associated with external purifiers

"Switching over to BIP® cylinder technology is very easy because no adaptation of the current system is required."

Dr. Frank David. R&D Manager, Research Institute for Chromatography, Belgium.

More than gas, it is reliability

This market leading technology features a non-return valve and residual pressure valve making it impossible for external contamination to enter the cylinder. Besides, Air Products carries out strict quality controls to guarantee the purity of the gases. Each cylinder is delivered with a certificate of conformity. Perfect gas quality is therefore assured every time. Though minimal, the risks associated with gas contamination are serious and costly – business critical results become unreliable or late, production delays are incurred, not to mention all the hassle and cost. BIP® technology provides insurance against such risks plus up to 20% more usable gas compared with traditional cylinders.

- No rogue cylinders
- Certified specs
- More usable gas for your money

But don't take our word for it…

It's a success that's widely recognised. BIP® technology received the Queens Award for Innovation in the UK in 2004 and is used by thousands of customers in Europe, including the top five manufacturers of analytical equipment as well as the national laboratories of seven European countries.

…just ask our customers!

"The BIP® cylinder technology from Air Products has demonstrated the potential for cost savings up to 70% in the FAME (fatty acid methyl ester) analysis system."

Dr. A Edge, Laboratory of the Government Chemist (LGC), UK.

BIP® Helium confirms that Einstein's predictions were right

Albert Einstein may be widely regarded as a genius of the twentieth century but some of his well-known predictions about the nature of the universe had been left unchallenged for more than a century. Now, an important space experiment has at last concluded that he was right all along.

The experiment, known as the Gravity Probe B, set out to test Einstein's Theory of Relativity about the nature of the universe – in particular his theory that space and time are distorted by the presence of massive objects like the Earth. Backed by NASA and Stanford University, the experiment has taken more than 40 years to complete.

As part of the experiment, four gyroscopes were launched into space to orbit the earth aboard a satellite at an altitude of 400 miles (640 km)

It was found that the Earth's presence caused the arc travelled by the satellite to shift at a rate of 37 milliarc-seconds. With an uncertainty of 19%, this measurement concurred with Einstein's prediction of 39 milliarc-seconds per year.

To assist with the experiment, Air Products supplied both gaseous and liquid helium. The gaseous helium, which was used to spin the gyroscopes, was supplied using Air Products' award-winning BIP® cylinder technology and was used to fill the inflight pressure bottles. The premium quality of the gases provided with BIP® cylinders avoid impurities that could have caused the gyroscope to freeze up and stop spinning.

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