



# Acetylene



$C_2H_2$

## How can I tell how much acetylene is in my Air Products cylinder?

Due to its hazardous nature, acetylene cannot be compressed into cylinders like other gases such as oxygen. Inside an acetylene cylinder there is a porous “mass” which is highly absorbent and filled with a solvent (acetone or dimethylformamide (DMF)). Acetylene gas is then dissolved into this solvent.

The amount of solvent in each cylinder is checked prior to filling and corrected to ensure it matches the tare weight stamped on the cylinder. The tare weight is equal to the weight of the empty cylinder plus the valve, guard\*, mass and the solvent. We identify this tare weight as ‘Tare’ on our cylinders (see photo below).

*\*DE: does not include the removable dome cap.*

The only way you can see for yourself how much acetylene is inside your cylinder is to weigh it and subtract the tare weight from the gross weight of the cylinder, this then gives the nett weight of the acetylene.

## Can I use a regulator to view acetylene content in a cylinder?

No. It is not possible <sup>1</sup> to use a cylinder regulator to view how much acetylene gas is in a cylinder. The pressure present in an acetylene cylinder is generated by the acetylene gas which has been released from the solvent. This pressure is dependent on the temperature of the cylinder and not the amount of acetylene in the cylinder.



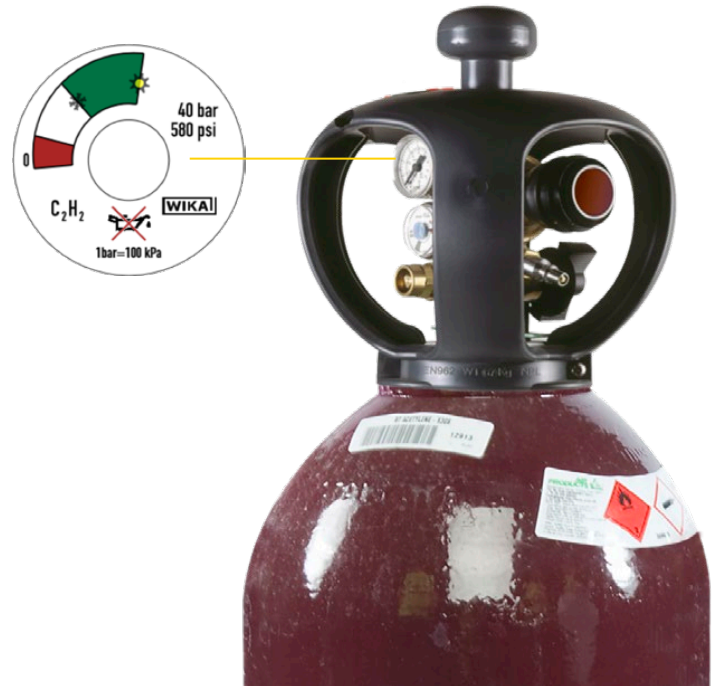
## What should I expect to see on the inlet gauge of my acetylene regulator?

When connected to a correctly filled acetylene cylinder, the inlet pressure gauge should indicate a pressure as shown in the table below:

Temperature °C	Pressure Bar(g) – acetone solvent	Pressure Bar(g) – DMF solvent
+40	21	To follow
+30	19	To follow
+20	15	To follow
+10	10.5	To follow
0	10	To follow
-10	8	To follow

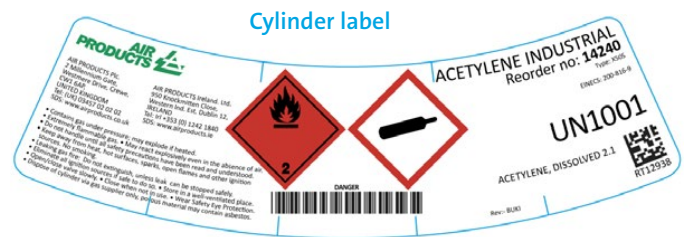
# The Air Products acetylene Integra® cylinder

The Air Products acetylene Integra® cylinder incorporates a special built-in cylinder pressure gauge that recognises the impact of ambient temperature relative to pressure. The scale on the gauge displays a range of pressures which should be achieved when the cylinder is full under normal ambient conditions. The gauge shows a 'sun' icon to indicate the pressure generated by a full cylinder on a warm day (To follow) and a 'snowflake' icon for the pressure on a cold day (To follow).



## How do I inform myself of how much acetylene is in my Air Products cylinder?

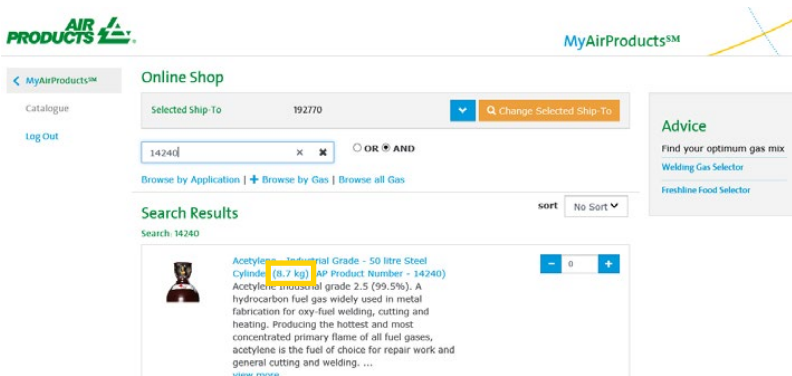
All cylinders and packs are identified with a product number. This linked to a volume amount, stated in Kg, which is shown on your user information, such as the order screen when using MyAirProducts or on your invoice. See example below for the X50S acetylene cylinder using order code PR14240:



### Invoice

Invoice		Air Products Plc 2 Millennium Gate Westmere Drive Crewes Cheshire CW1 6AP VAT Reg.No. GB217759047	
Currency: GBP		Date: 03.12.2018	Invoice No.: [REDACTED]
Page: 2 of 3			
Item	Product Detail	Quantity	Price
0020	Acetylene - Industrial Grade - 50 litre Steel Cylinder (8.7 kg) EA	1	20.000
	1 X 8.7 KG		
	Product Price		
	VAT		20.000 %

### MyAirProducts customer ordering/information portal



MyAirProducts gives you everything you need to manage your gas online - secure, online access, 24 hours a day, 365 days a year from any device.

## How do we get right?

Air Products operates a quality management system which is accredited part of our ISO9001 accreditation. This process of control ensures all cylinders are filled accurately by weight. Our processes ensure the weigh scales used to fill acetylene cylinders are calibrated, ensuring the correct amount of acetylene gas added to each cylinder.

## Solvents used in acetylene cylinders

### What is the difference between acetone and DMF?

Acetone is the most commonly used solvent, is the best choice for most applications and is available in individual cylinders and cylinder packs. DMF is selected when high purity acetylene, free from solvent contamination, is needed at high withdrawal rates. DMF is only used in cylinder packs.

## Practical use of acetylene

### What is the maximum withdrawal rate from an acetylene cylinder?

Use the correct flow rate for the acetylene application. To minimize the withdrawal of liquid solvent, acetylene should be withdrawn from the cylinder at a rate not to exceed 1/10 (one-tenth) of the capacity of the cylinder per hour during intermittent use. For full withdrawal of the contents of the cylinder on a continuous basis, the flow rate should be no

more than 1/15 (one-fifteenth) of the capacity of the cylinder per hour. Too high a flow rate causes solvent carry-over, flame disturbance and reduces the effectiveness of flashback prevention devices. Alternately, flashback may occur when the acetylene flow rate is lower than equipment needs.

#### Industrial grade

Product code	Cylinder /pack size	Weight of gas (kg)	Valve	Solvent	Gaseous litres of gas [2]	Maximum withdrawal – continuous (lpm)	Maximum withdrawal – intermittent (lpm)
14228	X10S	1.75	BS4	Acetone	1591	1.7	2.6
465456	X10SH	1.75		Acetone	1591	1.7	2.6
14232	X30S	6	BS4	Acetone	5455	6.0	9.0
123805	X30s	6	Integra® outlet	Acetone	5455	6.0	9.0
14240	X50S	8.7	BS4	Acetone	7909	8.7	13.1
14243	X51S	10	BS4	Acetone	9091	10.1	15.1
14244	X58S	9.4	BS4	Acetone	8545	9.4	14.2
140325	12X51S	102	BS4	DMF	92727	To follow	To follow

#### Premier grade

27311	X30S	6	BS4	Acetone	5455	6.0	9.0
185697	X51S	9.4	BS4	Acetone	8545	9.4	14.2
181859	12X51S	102	BS4	DMF	92727	To follow	To follow

#### Valve information

- BS4: 5/8" BSP left hand thread for use with separate dedicated regulator and flash back arrestor.
- Integra® outlet: Quick connection outlet with integrated flash back arrestor connection.

NB: As can be seen, the size of the cylinder/pack does not directly correlate to the cylinder contents, therefore, the contents in Kg – is the primary point of reference.

# Typical operating conditions

## What are the performance characteristics when using different nozzles with acetylene?

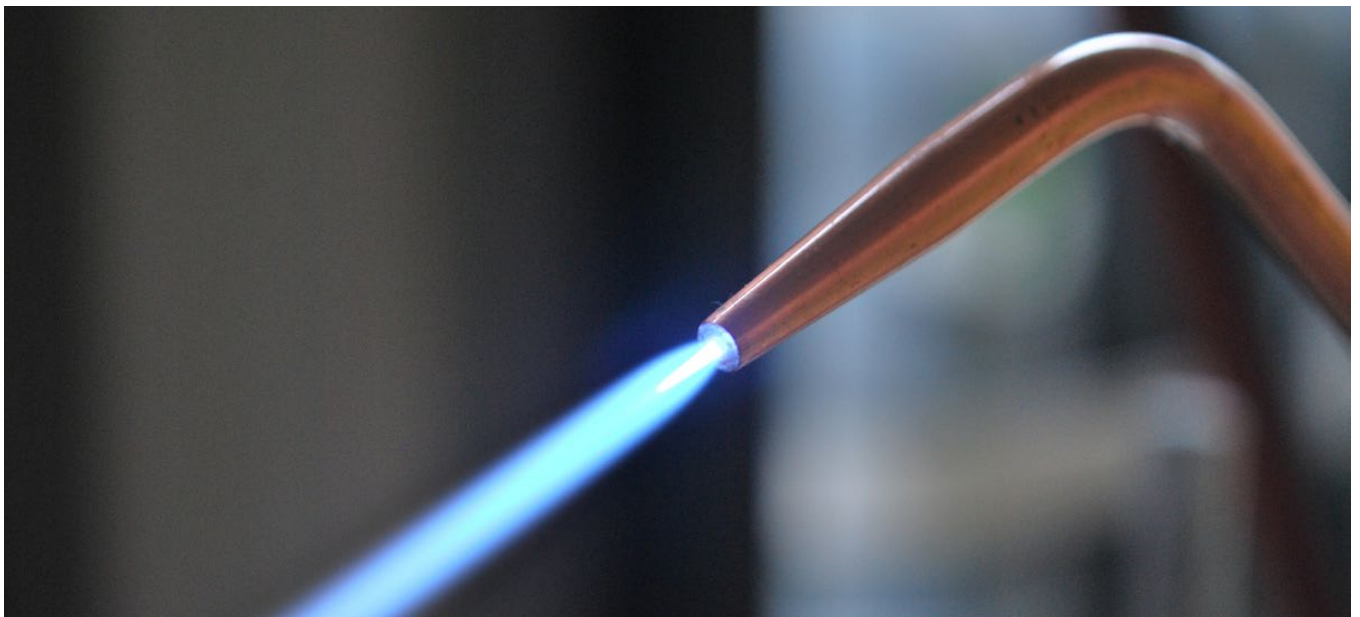
When using nozzles for cutting, welding and brazing, nozzle manufacturers guidance is the initial reference, however, as a guide, the following details the parameters for equal pressure nozzle-mix torches:

### Cutting

Nozzle size Inches	Plate thickness mm	Acetylene pressure bar	Oxygen pressure bar
1/32	3.0 - 6.0	0.15	1.5 - 2.0
3/64	6.0 - 20.0	0.15	2.0 - 3.0
1/16	20.0 - 75.0	0.15 - 0.2	3.0 - 4.0

### Welding and brazing

Nozzle size Nº	Plate thickness mm	Acetylene pressure bar	Oxygen pressure bar
1	0.9	0.15	0.15
2	1.2	0.15	0.15
3	2.0	0.15	0.15
5	2.6	0.15	0.15
7	3.2	0.15	0.15
10	4.0	0.2	0.2
13	5.0	0.3	0.3
18	6.5	0.3	0.3
25	8.0	0.4	0.4
35	10.0	0.6	0.6



## What do I need to do after transporting an acetylene cylinder?

If you need to transport an acetylene cylinder horizontally, ensure it is left to stand upright for 24 hours prior to use.

## Safe use of acetylene

### What is the maximum withdrawal rate from an acetylene cylinder?

- Secure cylinders in an upright position during storage, transportation and use.
- Use a suitable trolley when moving cylinders.
- Comply with safety requirements regarding the use of oxygen and acetylene cylinders and associated equipment.
- Wear all required personal protective equipment (PPE).
- If you need to transport an acetylene cylinder horizontally, ensure it is left to stand upright for 24 hours prior to use.
- Use an approved lighting up and shutting down procedure

## Further references

### Where can I find additional information relating to set-up and operating practice?

The **Air Products Welders Handbook** includes information on the following:

- Assembly and initial set-up
- Purging the system
- Lighting up
- Shutting down
- Quality
- Operating techniques

These handbooks are available directly from Air Products' customer service centre or via your Account Manager.

Notes:

[1] – When a cylinder is nearly empty (less than 1 kg) and the pressure drops below 6 bar, there is a relationship between pressure, temperature and acetylene content.

[2] – Based on Nm<sup>3</sup>/1000 @ 15°C

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