

High Purity Gases

From Argon to Xenon - Messer's extensive product portfolio of high purity gases



From "A" for argon to "X" for xenon, Messer offers an extensive range of high purity gases. The product portfolio comprises the "air gases" (nitrogen, oxygen and argon), carbon dioxide, carbon monoxide, hydrogen and the rare gases (helium, neon, krypton and xenon), the most important organic (e. g. methane, ethane, ethylene, acetylene, etc.) and inorganic gases (e.g. ammonia, chlorine, sulfur dioxide, etc).

Messer offers most high purity gases in several, graded qualities. Based on a strict quality management in the

manufacturing of high purity gases, Messer ensures a reliable quality of the high purity gas products.

All necessary information on specification of gases and the available container sizes are listed in the relevant product data sheets.

We will be glad to support you in finding the optimal product for your specific application.



Filling station for high-purity gases in Lenzburg

Product specification

The individual application defines the quality requirement of the gas. Due to the extreme variety of applications and corresponding specifications of gas purity as well as the type and maximum quantity of disturbing impurities, Messer provides high purity gases in several quality grades.

The point notation system has become generally established for easy identification of product purity. This indicates the purity based upon two numbers: the number before the point is the number of „nines“ of the gas purity expressed in volume percentage, and the number after the point is the final number, which is not a nine. For example: a purity of 99.9996 % is abbreviated as 5.6 with a maximum sum of 4 ppmv for the specified impurities.

The type of impurities contained in a particular pure gas largely depends on the production and purification process. For the user, however, the specification of the impurities interfering in their process is much more important. The selection of specified impurities is, therefore, based on the impurities interfering in the

typical applications of the gases. In most cases these are moisture, air components (oxygen and / or nitrogen), hydrocarbons or carbon monoxide and carbon dioxide.

Quality of high purity gases

The reliable product quality according to the product specification is the most important property of high purity gases.

In general, the final quality of high purity gases in cylinders critically depends on:

- the primary production or extraction process of the gas,
- possibly additional purification processes,
- the quality and pretreatment of the gas cylinders and
- the filling equipment and the filling processes.

Strict quality management is essential. We accurately monitor the quality of the raw materials, control all production steps and verify compliance of the final products with the specifications. Depending on the type of gas, the filling process and quality specification, the control measurements range from batch to individual cylinder analysis.

Compressed gas cylinders

The table below contains typical data for dimensions and contents of some standard cylinders. The designation of the cylinder provides information on the:

- Type (F: cylinder, B12: bundle of 12 cylinders),
- Geometric volume (in liters),
- Material (no indication: steel, Alu: aluminum),
- Filling pressure (e.g. 200 bar).

For example: “F50 200 bar” means a steel cylinder with a geometric volume of 50 l and a filling pressure of 200 bar. In addition, depending on the type of gas, there are numerous special containers, e.g. cylinders with filling material (for acetylene) or drums for some organic and inorganic gases.

Duplex bundle

Many installations at customer’s sites are designed for the 200 bar-technology. However, in order to benefit from the 300 bar supply option, Messer offers duplex systems.



Such 300 bar bundles are equipped with an integrated pressure regulator so that a safe use for 200 bar approved installations is possible without any additional measure.

Cylinder	Gas Content	Outside Diameter	Length	Empty Weight
	<i>m³</i>	<i>mm</i>	<i>mm</i>	<i>kg</i>
F 2 200 bar	0.4	100	350	2.5
F 5 200 bar	1	140	440	5.5
F 10 200 bar	2	140	810	12
F 20 200 bar	4	204	790	25
F 20 300 bar	6	204	815	39
F 33 300 bar	10	229	1150	50
F 50 200 bar	10	229	1500	57
F 50 300 bar	15	229	1488	71
F 2 Alu 200 bar	0.4	102	390	2.6
F 5 Alu 200 bar	1.0	140	525	6.5
F 10 Alu 200 bar	2	140	995	11
F 20 Alu 200 bar	4	204	940	23.4
F 40 Alu 200 bar	8	229	1455	46
F 50 Alu 200 bar	10	250	1530	57.5
B 12 x F 50 200 bar	120	L 990 / B 750 / H 1'838		920
B 12 x F 50 300 bar	180	L 990 / B 750 / H 1'838		1'100
MegaPack 4 (B4 x F 150 200 bar)	120	L 870 / B 880 / H 2'260		1'020
MegaPack 4 (B4 x F 150 300 bar)	180	L 870 / B 880 / H 2'260		1'020
MegaPack C4 (B4 x F 150 200 bar)	120	L 920 / B 930 / H 1'950		1'100
MegaPack C4 (B4 x P 150 300 bar)	180	L 920 / B 930 / H 1'950		1'100

Typical data of compressed-gas cylinders

Identification of the properties and hazards of gases in cylinders

The marks on the shoulder of compressed gas containers contain the specific cylinder number as well as information about approval for gas species, test dates, materials, owner, etc.

It is important to note that the marks of the approval for gas species is no indication of the actual content; this is solely specified on the label of the cylinder.

Labelling

Labels attached to the cylinder shoulder or body serve for identification of the gas in the cylinder. In accordance with ADR/RID or SDR (European and Swiss transport regulations) and CLP (European regulation on Classification, Labelling and Packaging of substances and mixtures) the labels contain the name of the gas, the UN number, the ADR symbols and CLP pictograms, as well as safety information for transportation and advice on the safe handling of the gas (hazard and precautionary statements).





The labels and the Safety Data sheets should be read carefully before using the gas.



Hazardous goods label

Shoulder color

The color coding of the cylinder shoulders is defined in EN 1089-3. A distinction is made according to four possible hazards: inert, flammable, oxidizing and toxic / corrosive. In addition, special colors are explicitly defined for some gases.

Properties	Shoulder color	Examples
Inert	 Bright green (RAL 6018)	Krypton, xenon, neon, shielding gas mixtures, compressed air
Flammable ⁽¹⁾	 Red (RAL 3000)	Hydrogen, methane, ethylene, forming gas, nitrogen / hydrogen mixture
Oxidizing ⁽²⁾	 Light blue (RAL 5012)	Oxygen mixtures, nitrous oxide mixtures
Toxic and/or corrosive ⁽³⁾	 Yellow (RAL 1018)	Ammonia, arsine, chlorine, fluorine, carbon monoxide, nitric oxide, sulfur dioxide

Colour coding of the cylinder shoulder according to EN 1089-3

¹⁾ See ADR/RID for definition of flammable / non-flammable.

²⁾ See ADR/RID for definition of oxidizing / non-oxidizing.

³⁾ See ADR/RID for definition of toxic / non-toxic and corrosive / non-corrosive. In this case, corrosive means causing burns to human tissue.

Gas	Schulterfarbe
Nitrogen (N ₂)	 Black (RAL 9005)
Oxygen (O ₂)	 White (RAL 9010)
Argon (Ar)	 Dark green (RAL 6001)
Acetylene (C ₂ H ₂)	 Oxide red (RAL 3009)
Nitrous oxide (N ₂ O)	 Blue (RAL 5010)
Carbon dioxide (CO ₂)	 Grey (RAL 7037)
Helium (He)	 Brown (RAL 8008)

Colour coding for specific gases

Argon Ar

Bezeichnung / Kennzeichnung
CAS-Nummer 7440-37-1
Bezeichnung nach ADR UN 1908 ARGON, VERDICHTET, 2.2, (E)
Behälterbezeichnung Schmelzfarbe: dunkelgrün

Wesentliche Eigenschaften
verdichtetes Gas, schwerer als Luft, farblos, geruchlos

Gefahrensymbole

Physikalische Eigenschaften
Molare Masse 39,948 kg/kmol
Gasdichte bei 0°C und 1,013 bar 1,784 kg/m³
Dichteverhältnis zu Luft 1,3797

Weitere Informationen entnehmen Sie bitte dem Sicherheitsdatenblatt CH-AR-003A

Ventil / Armaturen
Ventilschneide 300 bar: DIN 477 Nr. 6-W 21 80 x 1/4"
300 bar: ISO 5145 Nr. 1; W 30 x 2

Empfohlene Armaturen Spectrolab PM 51 / FM 52 exact
Spectrochem FE 51 / FE 52 exact

Spezifikation / Lieferform	Argon 4.8	Argon 5.0	Argon 6.0
Zusammensetzung			
Ar	99,998	99,999	99,999
			Vol.-%
Neberbestandteile			
O ₂	3	2	0,3
N ₂	10	5	0,5
KW (als CH ₄)	0,2	0,1	0,1
CO + CO ₂	0,2	0,1	0,1
H ₂ O	4	3	0,5
Ballonvolumen			
CAN-Gas	-	0,01	-
F 2 200 bar	-	-	0,43
F 5 200 bar	1,1	-	-
F 10 200 bar	2,1	2,1	2,1
F 20 200 bar	4,3	-	-
F 50 200 bar	10,7	10,7	10,7
F 50*12 200 bar	128,6	128,6	128,6
F 50 300 bar RPV	-	15,3	-
F 50*12 300 bar RPV	183,4	183,4	-
F 50*12 300 bar Duplex	183,4	183,4	-
MegaPack CA 300 bar Duplex	183,4	183,4	-

Hinweise
Anwendungen:

Messer Schweiz AG
Sonnenstrasse 75
5600 Lenzburg
info@messer.ch
http://www.messer.ch

Version 1.1 (05/2020)

Product data sheets

Comprehensive information on our products, such as the specifications and the standard cylinder sizes are stated on the relevant product data sheet. Messer offers high purity gases in various cylinder sizes to meet the requirements of every application. This comprises high purity gases in 1 l pressure cans up to cylinder bundles. Based on the information of the product data sheet you can easily choose the optimal solution for your specific application. A list of the physical properties of the respective gas and information about the required withdrawal equipment are provided as well.

Safety Data Sheet
according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
Argon
New data: 24/02/2013
SDS reference: CH-AR-003A
Supersedes: 17/05/2015
Revision date: 01/04/2020
Version: 1.0

Warning

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Trade name : Argon
SDS no : CH-AR-003A
Chemical description : Argon
CAS-No. : 7440-37-1
EC-No. : 231-147-0
EC Index No. :
Registration-No. : Listed in Annex IV / V REACH, exempted from registration.
Chemical formula : Ar

1.2. Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses : Industrial and professional uses. Perform risk assessment prior to use.
Test gas/calibration gas.
Purge gas, diluting gas, inerting gas.
Purging.
Laboratory use.
Use for manufacture of electronic/photovoltaic components.
Shield gas for welding processes.
Contact supplier for more information on uses.
Food applications.
Consumer use.
Uses advised against : Attention: These products must not be applied to humans or animals unless they are expressly designated as medical or medicinal gases!

1.3. Details of the supplier of the safety data sheet
Company identification : Messer Schweiz AG
Sonnenstrasse 75
5600 Lenzburg - Switzerland
T 0041 62 886 41 41
www.messer.ch
info@messer.ch

1.4. Emergency telephone number
Emergency telephone number : 0041 62 886 41 41 / Toll-free: 0041 44 251 51 51

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification according to Regulation (EC) No. 1272/2008 (CLP)
Physical hazards : Press. Gas (Comp.) H280

2.2. Label elements
Messer Schweiz AG
Sonnenstrasse 75
5600 Lenzburg, Switzerland
0041 62 886 41 41
EN (English) SDS Ref.: CH-AR-003A 1/10

Safety data sheets

Safety data sheets are particularly important for the safe use of pure gases and gas mixtures. These documents provide information on the properties, hazards, as well as instructions for the handling, disposal and transport according to the REACH and GHS/CLP regulations. Moreover, safety data sheets include the relevant actions for firefighting, and recommendations to limit and monitor exposure.

Argon Ar

Bezeichnung / Kennzeichnung
CAS-Nummer 7440-37-1
Bezeichnung nach ADR UN 1908 ARGON, VERDICHTET, 2.2, (E)
Behälterbezeichnung Schmelzfarbe: dunkelgrün

Wesentliche Eigenschaften
verdichtetes Gas, schwerer als Luft, farblos, geruchlos

Gefahrensymbole

Weitere Informationen entnehmen Sie bitte dem Sicherheitsdatenblatt CH-AR-003A

Bezeichnung
Farbloses, geruchloses Edelgas, schwerer als Luft. In geschlossenen Räumen wird die Atemluft verdrängt, keine Warnsymptome (Erstickungsgefahr).

Materialien
Flaschen u. Ventile: alle Zylinder Werkstoffe
Dichtungen: PTFE, PCTFE, PVDf, PA, PP, IR, NBR, CR, FVM, Q, EPDM

Physikalische Eigenschaften		Dampfdruck bei 0°C	
Molare Masse	39,948 kg/kmol	Gasdichte bei 0°C und 1,013 bar	1,784 kg/m ³
Siedepunkt	150,86 K	Dichteverhältnis zu Luft	1,3797
Temperatur	48,98 bar	Gasdichte bei 10°C und 1 bar	1,669 kg/m ³
Dichte	0,5287 kg/l	Umverträglichkeit	
Tropfpunkt	83,90 K	Flüssig bei Ts zu mp Gas (15°C, 1 bar)	0,8352
Temperatur	0,6891 bar	Wärmeleitfähigkeit	
Druck	830 bar 35°C	Bei bei 0°C	-0,36*10 ⁻³ bar ⁻¹
Steiggeschwindigkeit	81,290 K; 189 °C	Quotienten bei 80°C und 1 bar	-0,61*10 ⁻³ bar ⁻¹
Temperatur	1,3840 kg/l	spezifische Wärmekapazität cp	0,5216 kJ/kg K
Flüssigdicke	181,3 kJ/kg	Wärmeleitfähigkeit	178,2*10 ⁻⁴ W/m K
Verdampfungswärme	dynam. Viskosität		22,8*10 ⁻⁴ Ns/m ²

Hinweise
Anwendungen:

Messer Schweiz AG
Sonnenstrasse 75
5600 Lenzburg
info@messer.ch
http://www.messer.ch

Version 1.1 (05/2020)

Technical data sheets

Further information on high purity gases can be found in the technical data sheets, which contain tables listing the properties, the main physical data as well as the compatibility of materials for each gas. The technical data sheets can be found on page 2 of the corresponding product data sheets.

The physical properties of the most frequently used gases are also compiled in our mobile "Gasprops"- App, which is available for iOS and Android.

Cylinder connection and equipment

The valve outlet connections of gas cylinders comply with the relevant national standards. These standards define the valve outlet connections depending on the type of gas. Only the outlet connections of 300 bar cylinders are defined EU-wide in the ISO 5145:2004. The appropriate connection is specified on the product data sheet.

Appropriate equipment is needed for the safe withdrawal of the gas. A cylinder pressure regulator can be used if only one application has to be supplied with gas and the cylinder can be placed right next to the point of use. With a central gas supply system, consisting of pressure control panels, pipelines and tapping points at the various points of use, the gas cylinders are safely stored outside of workplaces.



Further information

Special brochures are also available on the following topics:

- Specialty Gases
- Gas Mixtures
- Helium
- Balloon Helium
- CANGas
- Specialty Gas Equipment
- Process Gases for Analytical Applications
- Environmental Analysis
- myLab.

For further information please also visit the specialty gases - website of the Messer Group.

You can easily reach the website via the link in the address or with the QR code shown here.



gasesforlife.de



Reine Gase: 01 / 2021

Service and support

We will be glad to support you in choosing the suitable gas quality and gas supply equipment for your specific requirements.

MESSER 
Gases for Life

Messer Schweiz AG

Seonerstrasse 75

5600 Lenzburg

Tel. +41 (0)62 886 41 41

info@messer.ch

<https://www.messer.ch>

<https://specialtygases.messergroup.com>