

What are the industrial gases used in the steel industry?

Industrial gases used in the steel industry

The term "industrial gases" refers to a group of gases that are used exclusively in various industrial processes (Figure 1). They are distinguished from fuel gases. However, acetylene is sometimes considered to be an industrial gas. Specialty gases, such as neon, krypton, xenon and helium, are sometimes also considered to be industrial gases. Industrial gases are produced and supplied as gases and liquids, and are transported in cylinders, bulk liquids or as gases in pipelines. The industrial gases commonly used in the steel industry are oxygen, nitrogen, argon and hydrogen.

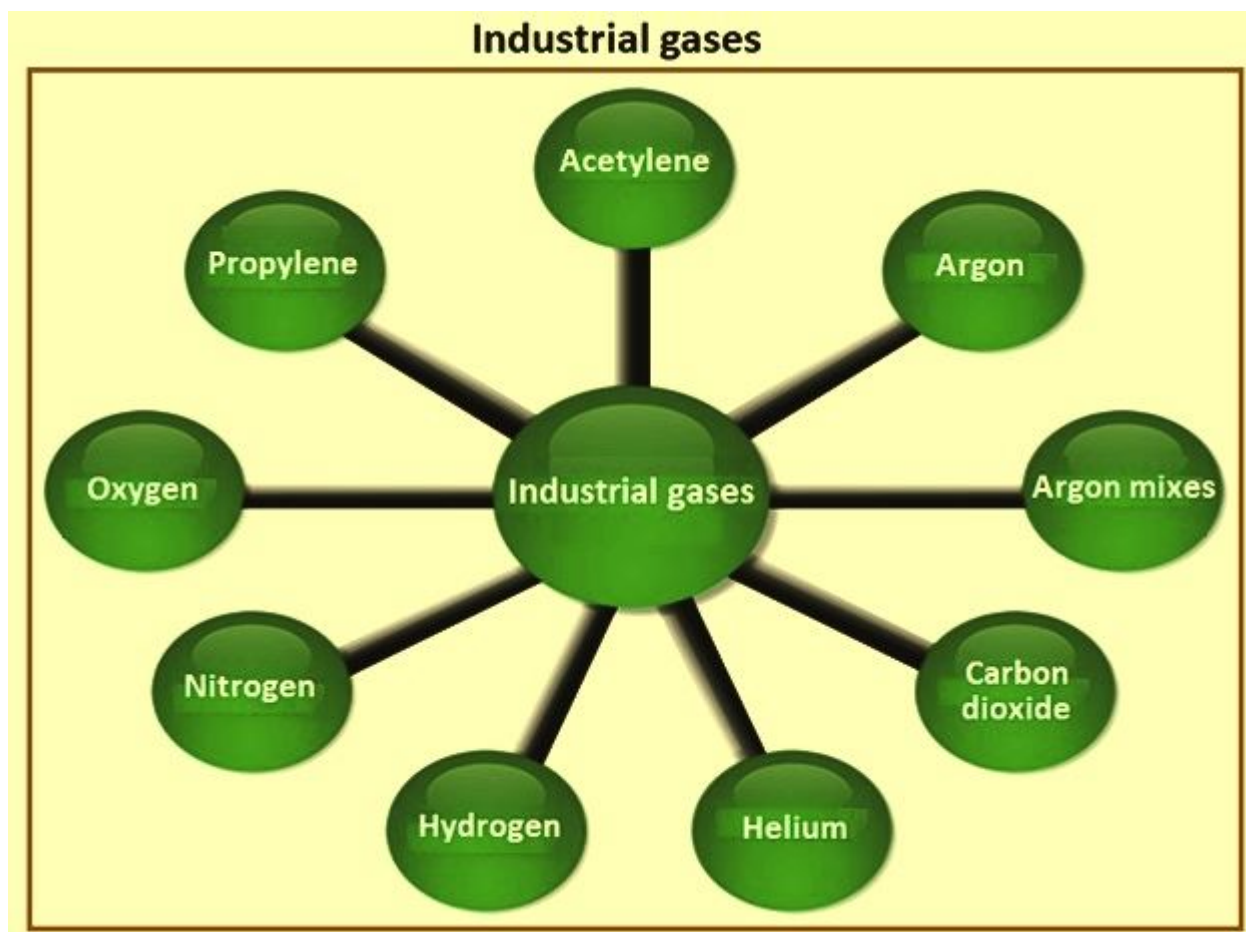


Figure 1 Industrial gases

Industrial gases are supplied in a range of different cylinders, depending on the characteristics of the gas. Some are supplied at high pressure, while others can only be supplied at low pressure. The characteristics of industrial gases determine the way in which they are supplied to customers. Gases such as oxygen, nitrogen, argon and hydrogen can easily be compressed into cylinders at a pressure of 200 bar. Acetylene, due to its characteristics, needs to be stored in a cylinder containing a "porous block" where the gas is kept in a carrier solvent.

Industrial gas cylinders are available in a range of sizes, usually classified by the water capacity of the container. Which size is most appropriate depends on a range of factors,

including consumption and flow rate. In addition, each cylinder is fitted with a cylinder valve customized to suit the gas and pressure requirements. Outlet threads are determined by national standards to ensure that only regulators compatible with these requirements can be installed. In addition, for applications requiring higher volumes, industrial gases are supplied in a series of cluster cylinder pallets, which consist of multiple cylinders connected together and shipped on pallets.

The industrial gases commonly used in the steel industry are oxygen, nitrogen, argon, hydrogen and acetylene. The properties of these gases are given in Table 1. A description of these gases is given after the table. In addition, some special gases and gas mixtures are used for instrumental analysis work in steel mill laboratories.

Tab 1 Properties of industrial gases							
Gas	Proper	U	O	Ni	A	Hy	Ace
	ty	nit	xygen	trogen	rgon	drogen	tylene
Chemical			O		A		C2
symbol			2	N2	r	H2	H2
Molecular		g/	3	28.	3		26.
weight		mol	2	01	9.95	2.02	038
	Tempe	deg	-	-	-	-	
Boiling	rature	C	183	195.8	185.9	252.8	
point at 1.033	Latent						
kg/sq cm	heat of	kc	5	47.	3	106.	
	vaporization	al/kg	0.91	586	8.791	597	
Gas							
phase	Specific	Air	1.	0.9	1.	0.0	
properties at 0	gravity	= 1	113	737	39	6998	0.91

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