



Visualisation of a plant concept with four storage blocks of six modules each.

Your brief

From this, WOLF sets tube diameter, wall thickness and tubes per module

351 kg

Calculation example: usable per module with 16 tubes, between 140 and 15 bar at 40 °C

3 design codes

AD 2000, EN 13445 or ASME Section VIII, as you choose

Calculation example: buffer time and energy content by number of modules

Hours during which the plant absorbs the surplus of an electrolyser or replaces its output. Usable between 140 and 15 bar at 40 °C.

Modules	Usable in t	Energy content in MWh	Buffer time in hours at			
			25 MW	50 MW	100 MW	200 MW
6	2.1	70	4.6	2.3	1.2	0.6
12	4.2	140	9.3	4.6	2.3	1.2
24	8.4	281	18.5	9.3	4.6	2.3
36	12.7	421	27.8	13.9	7.0	3.5
48	16.9	562	37.1	18.5	9.3	4.6

1 MW of electrolyser capacity corresponds to 18.2 kg of hydrogen per hour (55 kWh/kg); lower heating value 33.3 kWh/kg. The usable quantity depends on the minimum pressure at your consumer; WOLF calculates it for your minimum pressure and sizes the tubes and modules to your load and pressure profile.

Permits in the EU

Under the Seveso III Directive (2012/18/EU), a site holding 5 t of hydrogen or more is a lower-tier establishment, 50 t or more an upper-tier one; other dangerous substances on site are taken into account. National permit thresholds apply in addition. The decisive figure is the maximum inventory at the filling limit. It is higher than the usable quantity; WOLF states it in the project.

Directive 2012/18/EU, Annex I, Part 2, entry 15.

Information for planning and permits

With the plant concept

- Plant layout
- Budgetary quotation

In the project

- Safety concept and P&ID
- Load data for the foundations
- Maximum inventory per expansion stage
- Draft inspection plan
- Participation in your HAZOP

Your enquiry

For your plant concept with a budgetary quotation, send the following to sales.hydrogen@rjwolf.de: application and gas source, usable quantity or buffer time, compressor discharge pressure and minimum pressure at the consumer, filling and withdrawal rates, load cycles and service life, site plan and lowest ambient temperature, design code, schedule and expansion stages.

Daniel Wolf

Telephone +49 2739 8970-0 · sales.hydrogen@rjwolf.de · www.rjwolf.de

Robert Josef Wolf GmbH & Co. KG · Dortmunder Straße 2 · 57234 Wilnsdorf · Germany

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More information:
www.h2-anywhere.com



Key data and scope of supply

Key data

Feature	BLOXX CUSTOM
Type	Tube storage plant made of storage modules, stacked on up to three levels, in storage blocks with valve gallery, platforms and stairs
Design basis	Your brief on pressure, storage capacity, load cycles, temperature, plot area and safety; from this, WOLF determines tube diameter, wall thickness, material and length, tubes per module, modules and levels
Storage module	Storage tubes in a steel frame with header, remotely operated isolation valve and its own relief line, assembled before delivery
Storage tube	Steel tube with forged hemispherical heads
Calculation example	16 tubes per module, each with about 2.5 m ³ water capacity and about 25 kg of hydrogen at 140 bar and 40 °C; per module 351 kg usable between 140 and 15 bar, about 3,900 Nm ³ , 11.7 MWh (lower heating value)
Code and conformity	AD 2000, EN 13445 or ASME Section VIII as you choose; in the EU, conformity assessment under the Pressure Equipment Directive with a notified body
Load cycles	Fatigue and crack growth assessment for hydrogen service, aligned with the chosen code; permissible load cycles and calculated service life stated in the project
Protection	Isolation valve per module, fails closed on loss of power; pressure relief per module that cannot be isolated; filling monitored at the interface station
Fire protection	Gas and flame detectors, emergency depressurisation through vent stacks as set out in the safety concept; as an option, passive fire protection jet-fire tested to ISO 22899-1
Inspection	On request, pressure and leak test of each module before delivery; periodic inspection module by module on site to the project inspection plan
Transport and installation	Modules shipped without hydrogen as abnormal loads, connected by clamp and flange joints; dimensions, masses and crane requirements in the project

Scope of supply

WOLF agrees the scope of supply and the interfaces to compressor, control system, foundations and utilities with you in the project.



Storage module as an abnormal load, visualisation.

Calculation example for the reference design with 140 bar filling pressure and 15 bar residual pressure at 40 °C, real gas values, standard volume to DIN 1343. Pressures are gauge pressures. The image is a visualisation of a plant concept. WOLF defines quantities, pressures, tube dimensions and design for each project to your brief; only the offer and the order confirmation are binding. Subject to technical change.