VELAN

VELFLEX
Patented Technology

Cryogenic Metal Seated Butterfly Valves

The Key to Cryogenic Valve Solutions

VELAN Inc Group

VELAN inc is one of the world's leading independent manufacturer of steel gate, globe, check, butterfly and ball valves. Founded in 1949 in Montreal - Canada, VELAN inc employs over 2.000 people and is located worldwide with 14 specialized manufacturing plants in Canada, USA, France, Portugal, Germany, UK, South Korea, Taiwan, China.

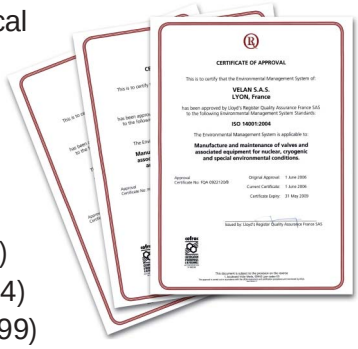
Design & Technology

VELAN SAS has strong design, research & development capabilities to keep valves on the cutting edge of technology in the field of Nuclear Power and cryogenics.
Our research laboratory is equipped with advanced facilities such as steam test loop, Cv loop, cryogenic test benches and CAD-FEM software.

Quality Assurance

With 30 years of experience in the supply of valves for critical applications, VELAN SAS has a comprehensive Quality Management system including the following certifications :

- ISO 9001 (edition 2000)
- ISO 14001 (edition 2004)
- OHSAS 18001 (edition 1999)



Maintenance & Customer Services

VELAN SAS has a fully integrated maintenance and services department able to carry out on-site servicing worldwide, that gives us a continuous feedback experience to improve valve performances.
The Maintenance & Customer Services department gathers all competences to handle large turnkey maintenance operation or specific on-site services in severe environments.

VELAN S.A.S

Located in Lyon - France, in a modern 160.000 sq.ft. (16.000 m²) plant, VELAN SAS is a 100% subsidiary of VELAN inc group (Canada).

VELAN SAS is specialised in design and manufacture of high performance valves for Nuclear and Cryogenic applications.

Air Tech Photo

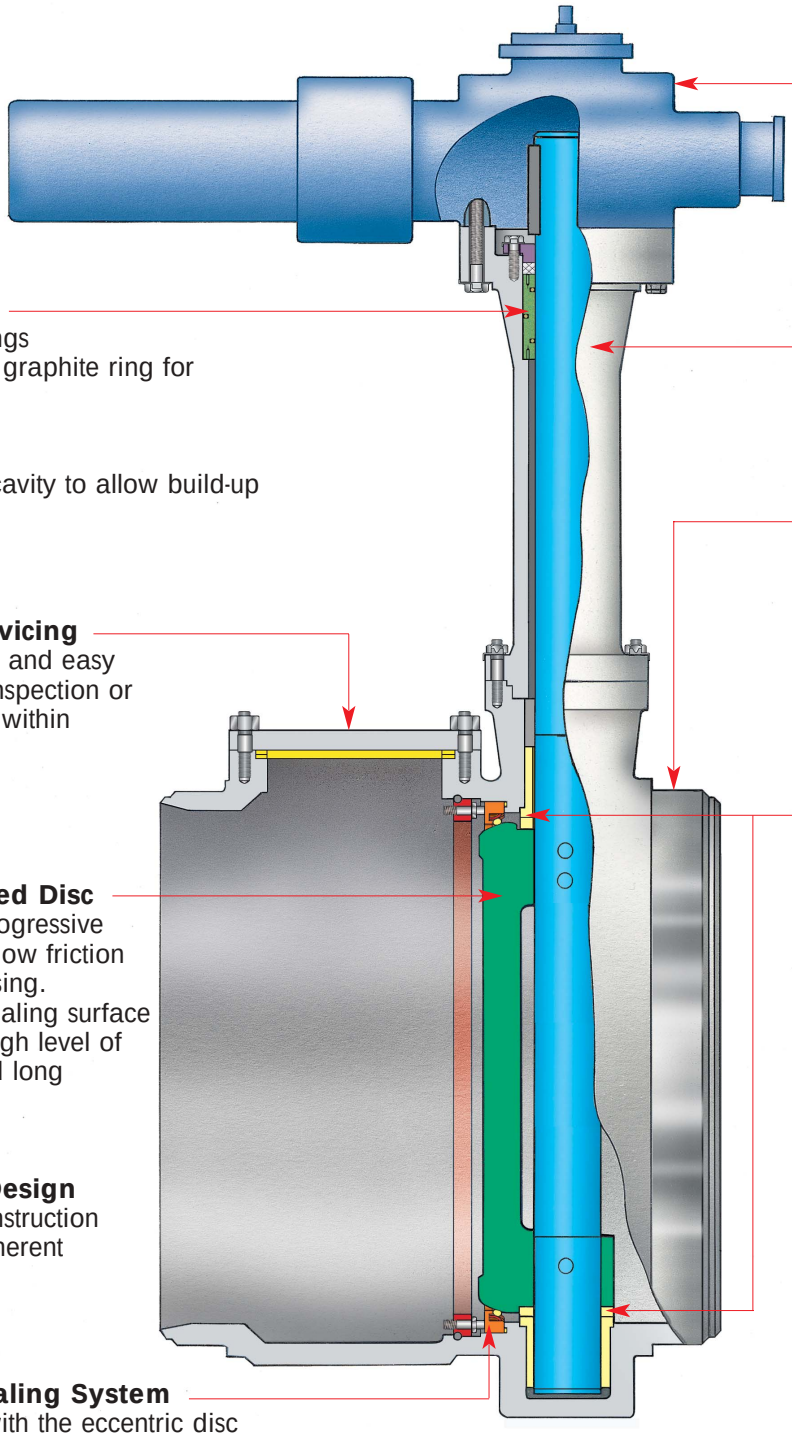
High Performance Production Equipment

High performance production equipment such as CNC machining centers, plasma hard facing stations, 3D measuring machine, clean assembly room, enables us to provide to our customers a constant high level of quality.

Worldwide Sales Network

VELAN SAS products are available worldwide through the sales network of VELAN inc group.

Valve design features



- **Actuators**
  Pneumatic, hydraulic, electric or manual gear
  Fast acting actuators for Emergency Shut Down function (ESD)

- **Stem Seal**
  - Viton O-rings
  - Expanded graphite ring for "fire safe"

- **Extended Bonnet**
  With a sufficient gas column to keep the stem packing away from the cold fluid

- **No Cavity**
  There is no cavity to allow build-up of solids

- **High Quality Castings**
  With X-ray and PT examinations from approved foundries

- **In-Line Servicing**
  Allows quick and easy in-line seat inspection or replacement within minutes

- **Stainless Steel Shaft Bearings**
  Coated with nickel-reinforced PTFE for high cycle and smooth operation

- **Off-Centered Disc**
  Ensures a progressive smooth and low friction seat-disc closing.
  Hardened sealing surface to provide high level of tightness and long lifetime

- **Fire Safe Design**
  All metal construction providing inherent fire safe

- **Unique Sealing System**
  Combined with the eccentric disc rotation, the patented flexible metallic seat provides an exceptional tight shut-off even with high temperature fluctuations

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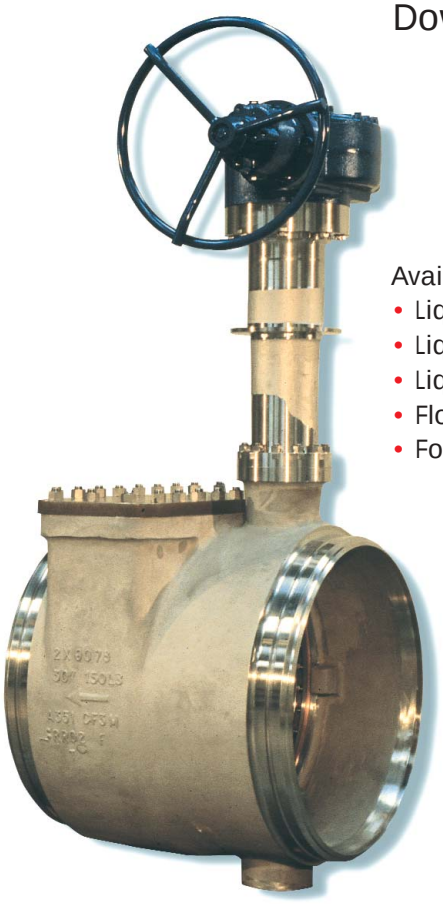
42” BW Side Entry Butterfly Valve after cryogenic tests

Reliability

Reliability of valve operation affects service life and ease of inspection and maintenance. In order to predict reliability, a sound valve design must be backed up by a stress analysis and functional qualification testing under critical operating conditions.

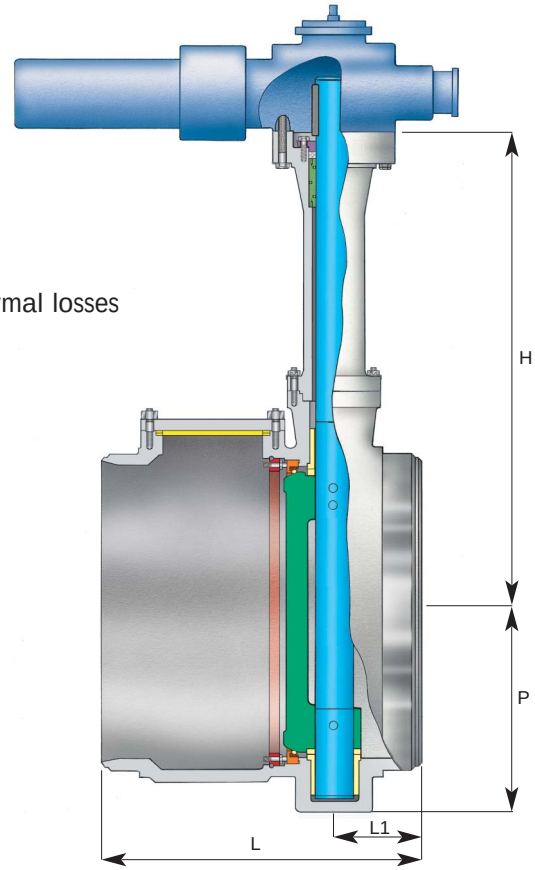
Butt weld end valves

DN 150 - 1050 NPS 6” - 42”
Class 150 - 300
Down to -252°C (-420°F)



Available versions for :

- Liquefied Hydrogen
- Liquefied Oxygen
- Liquefied Helium, reduced thermal losses
- Flow control service
- Forged Design



Materials

Part	ASTM grade	Part	ASTM grade
Body	A 351 CF 3M	Extension	A 351 CF 3M or A 479 F 316L
Stem	A 479 F 316 or Gr. 660	Gasket	Graphite
Disc	A 351 CF 8M or A 182 F 316	Stud	A 320 B 8M
Metallic seal	Copper or Nickel alloy	Nut	A 194 gr 8

Other materials available on request

Dimensions, Cv class 150

DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900	950	1000	1050
NPS	6	8	10	12	14	16	18	20	24	26	28	30	32	36	38	40	42
H	610	640	665	715	760	807	855	932	1050	1110	1170	1220	1240	1295	1510	1590	1590
P	122	148	180	207	232	270	303	331	395	430	455	500	520	560	648	680	703
L	395	410	455	480	530	555	590	625	680	625	770	795	830	900	1100	1190	1190
L1	125	130	140	145	165	165	175	185	190	200	215	215	230	265	315	335	335
Cv	903	1730	2810	4175	5850	7850	10190	12880	19370	23200	27440	32100	37210	48790	55200	62320	69860
Weight	79	96	147	200	275	335	425	555	824	1004	1202	1337	1606	2190	2252	3040	3048

Class 300 data available on request.
For larger sizes, contact us.

All dimensions are in mm
Weights are in kg

Design Standards

ANSI B16.34, ANSI B16.25, API 6FA, API 607, BS 6755, API 598.
In compliance with European Pressure Equipment Directive (PED), CE Marking for Europe.

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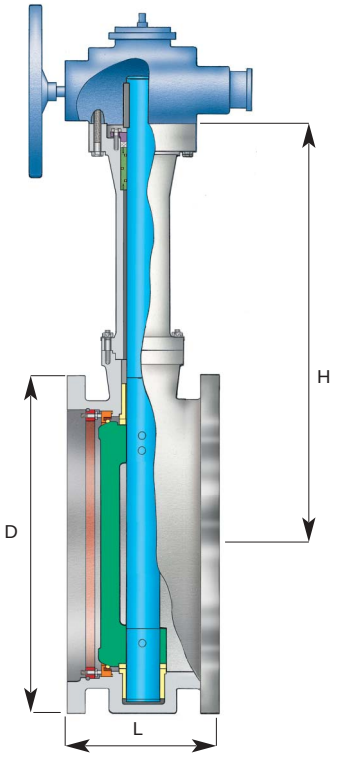
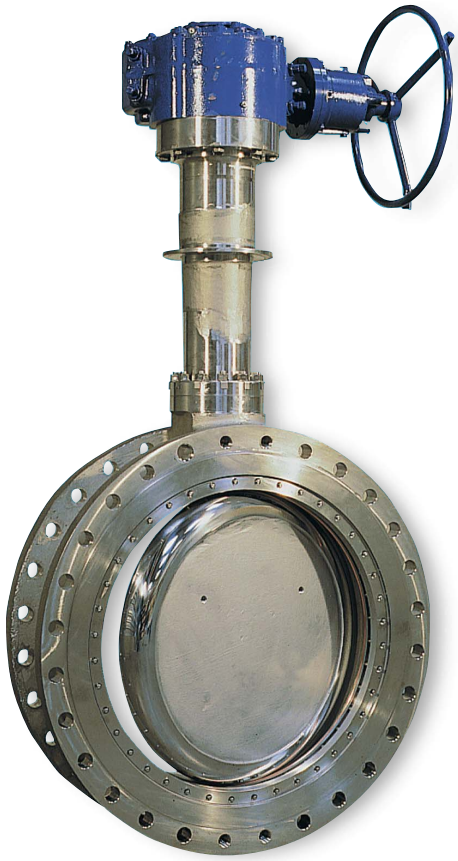
Flanged valves

DN 150 - 1200 NPS 6” - 48”
Class 150 - 300
Down to -252°C (-420°F)





Available versions for :

- Liquefied Hydrogen
- Liquefied Oxygen
- Liquefied Helium, reduced thermal losses
- Flow control service
- Forged Design

Materials

Part	ASTM grade	Part	ASTM grade
Body	A 351 CF 8M	Extension	A 351 CF 3M or A 479 F 316L
Stem	A 182 F 316 or Gr. 660	Gasket	Graphite
Disc	A 351 CF 8M or A 182 F 316	Stud	A 320 B 8M
Metallic seal	Copper or Nickel alloy	Nut	A 194 gr 8

Other materials available on request

Dimensions, Cv class 150

DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
NPS	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
L	140	152	165	178	190	216	222	229	267	288	292	308	318	330	410	430	470
H	610	640	665	715	760	807	855	932	1050	1145	1170	1220	1240	1295	1590	1590	1700
D	280	343	407	483	534	597	635	699	813	870	927	985	1060	1170	1289	1346	1511
Cv	930	1730	2810	4175	5850	7850	10190	12880	19370	23200	27440	32100	37210	48790	62320	69860	95770
Weight	59	81	117	170	255	315	395	395	649	815	990	1067	1277	1555	2658	2658	3150

All dimensions are in mm
Weights are in kg

Dimensions, Cv class 300

DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900
NPS	6	8	10	12	14	16	18	20	24	26	28	30	32	36
L	140	152	165	178	190	216	222	229	267	288	292	308	318	330
H	610	640	665	715	760	807	855	932	1050	1145	1170	1220	1240	1295
D	317.5	381	444.5	520.5	584	647.5	711	774.5	914.5	970	1035	1090	1150	1270
Cv	930	1730	2810	4175	5850	7850	10190	12880	19370	23200	27440	32100	37210	48790
Weight	73	101	142	215	315	385	495	580	809	1064	1292	1462	1672	1950

For larger sizes, contact us.

All dimensions are in mm
Weights are in kg

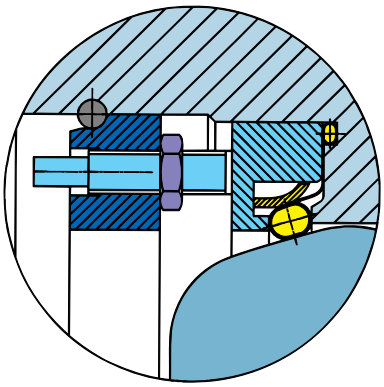
Design Standards

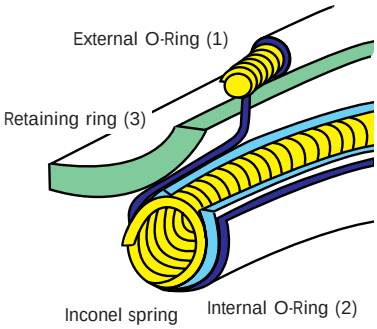
ANSI B16.34, ANSI B16.5, ISO 5752 short pattern, BS 5155, MS SSP 44, API 6FA, API 607, BS 6755, API 598.
Standard flange finish is FF and SF, other types (RF, RTJ...) are optional.
Alternative flange standards available on request.
In compliance with European Pressure Equipment Directive (PED), CE Marking for Europe.

Advanced Technical Features

Metallic flexible seat

A double spring-energized metallic O-ring seat provides a static (1) and dynamic seal (2) as well as the inherent fire safe function.
Each O-ring has a double envelope, the inner one in stainless steel, the external one in copper or nickel alloy. The spring is made of Inconel.
The flexible retaining ring (3) ensures a complementary contact pressure onto the disc.
Thanks to a special arrangement, the tightening screws are secured by a jam nut and can't be lost inside the piping.





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In-line easy maintenance

This design allows easy and quick in-line maintenance.
Thanks to the window placed on the side of the valve, free access inside the valve is possible for inspection and maintenance without disaccoupling the actuator.
No special tool is required.

Fire safe function

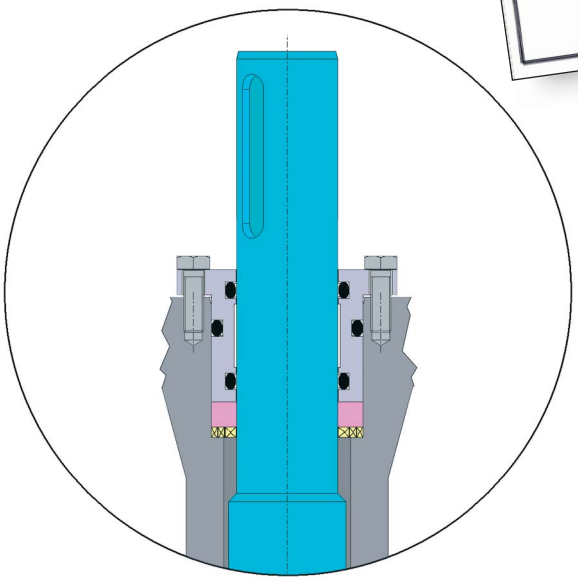
In compliance with:
- API 607
- API 6FA
- BS 6755 - Part II

BUREAU VERITAS

TEST CERTIFICATE N° LYN 498 221.A

Stem sealing

Stem sealing is achieved by a system of superposed O-ring gaskets and a graphite packing for the fire-safe function.



Low pressure drop

For gases

$$\Delta P = P_1 \cdot \sqrt{P_1^2 - 2\ dT \left(\frac{Q_g}{393\ Cv}\right)^2}$$

ΔP = Pressure drop : bar
P_1 = Upstream pressure : bar
Q_g = Volumetric flow of gas : m^3/h
d = Specific gravity of gas in standard conditions
T = Absolute temperature : K
Cv = Flow coefficient

For liquids

$$\Delta P = d \left(\frac{Q_L}{Kv}\right)^2$$

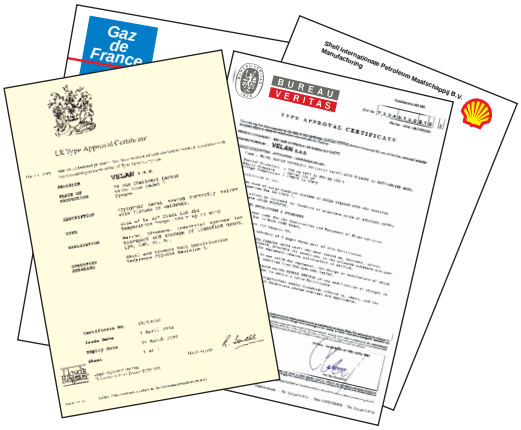
ΔP = Pressure drop : bar
Q_L = Flow of liquid : m^3/h
d = Specific gravity of liquid
Cv = Flow coefficient = 1.16 Kv

Capabilities & Experience

Testing

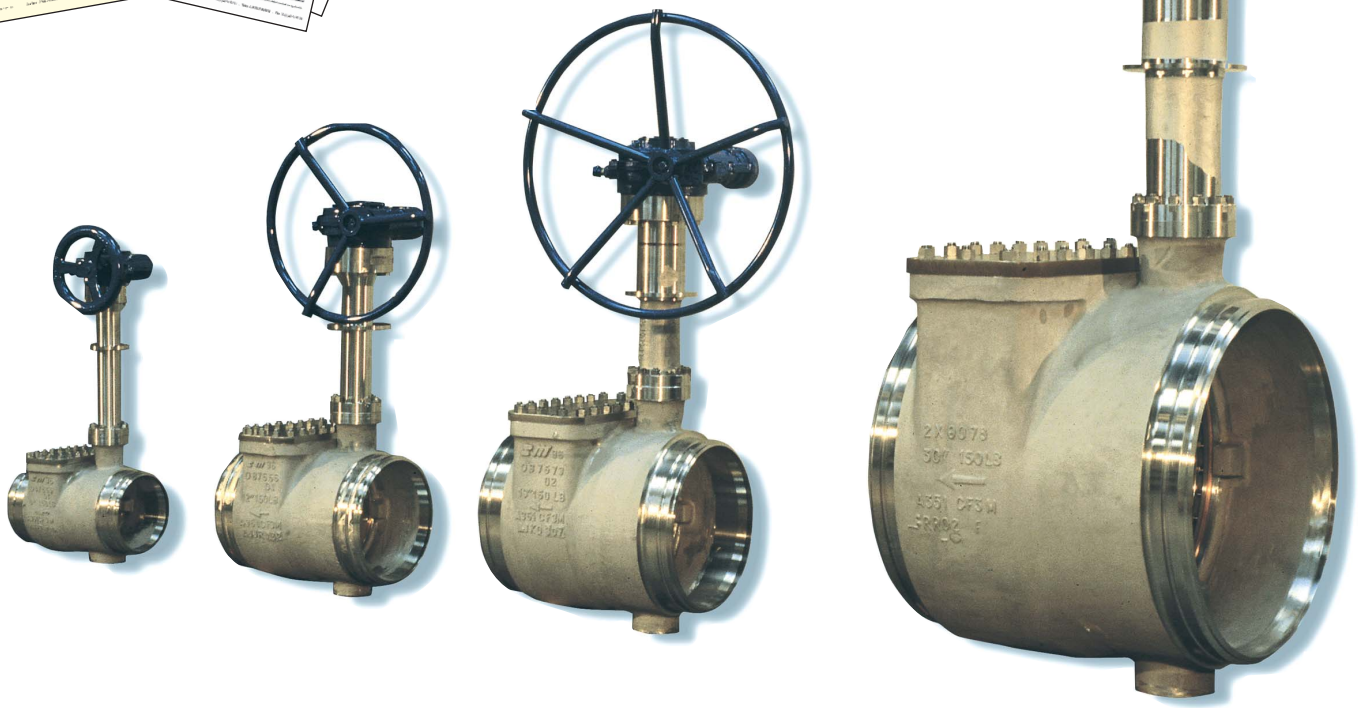
1600 m² dedicated to testing and inspection, including :

- alcohol test bench for pressure tests at ambient temperature.
- in-house cryogenic testing facility, including 2 nitrogen pools and a cryogenic bunker (for high pressure tests) for valve sizes up to 80" (DN 2000).
- all our tests are performed in accordance with the most stringent international standards.



Qualifications & type approvals

Pioneer in development of cryogenic butterfly valves for LNG, liquefied gases and aerospace applications, VELAN is always keeping its valves on the cutting edge of technology to provide high performance valves to the great satisfaction of its clients as attested by numerous references.



Main Applications :

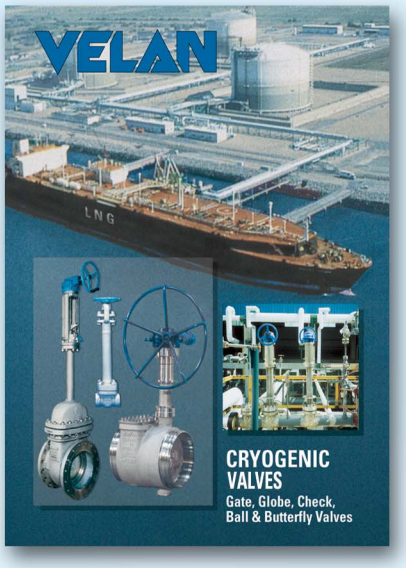
- LNG Liquefaction Plants
- LNG Receiving Terminals
- Air Separation Processes
- Petro-Chemical Processes
- Gas To Liquid (GTL)
- Aero-Space Storage Facilities

Main Fluids :

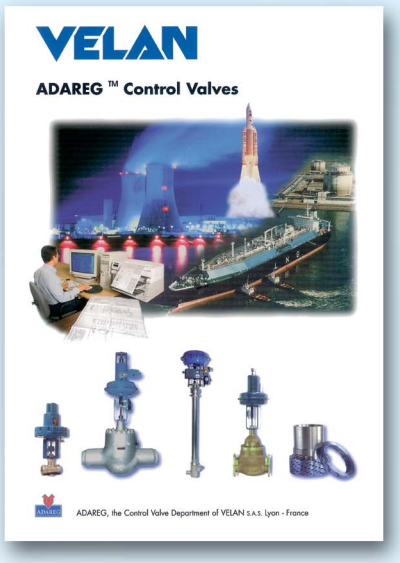
Fluid	Boiling Point (°C)	Boiling Point (°F)
Propylene	-47.60	-53.68
CO2	-78.50	-109.30
Ethylene	-103.70	-154.66
LNG	-161.60	-258.88
Oxygen	-182.96	-297.33
Nitrogen	-195.80	-320.44
Hydrogen	-252.87	-423.17

VELAN's Cryogenic Valves Range:

TORQSEAL



VEL - CRYO



ADAREG CONTROL VALVES

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