PACKING SYSTEMS

GLOBE
CONTROL VALVES

VALTEKSUL™

Packing Systems
Globe Control Valves

Introduction

Fugitive emissions in industrial equipments are nowadays the object of continuous studies and analysis aiming at the elimination or reduction, at the lowest possible rates, of fluid leaks to the environment.

This bulletin is intended to provide control valves users with relevant information about the globe valves packing systems standardized by ValtekSul, in accordance with modern requirements and regulations regarding fluid emissions into the environment, a topic of critical relevance in current times. Regulations from regulatory agencies such as the EPA*; ISO 15848-1 standards; ANSI/FCI 91-1, as well as specific user regulations, have been subject to strict requirements in relation to such a sensitive matter.

In the past, the packing selection of a control valve was based solely on an analysis of the operating temperature. For most valve specifications, the materials used were limited to the PTFE at temperatures up to 450°F (232°C), or the graphite packing for higher temperatures.

In this selection, other factors were not taken into account, such as: friction effects, hysteresis, life cycles, thermal expansion and pressure gradients, as well as the technological characteristics of the packing sets and their compatibility with the process fluids.

In virtue of our experience, we recognize that several other factors influence the good performance and long operating life of the packing, such as the surface finish on the plug stem, the polishing of the hole in the valve bonnet, the depth characteristics of the packing box, as well as its distribution. These factors strongly influence good performance.

As a selection principle, we can consider two types of packing in Globe control valves. The so-called Standard packings, lacking the environmental leakage rates regulated by international organizations, and the so-called Premium packings, which are the most effective and reliable, presenting leakage rates that must be inferior than 500 parts per million (ppm) or, in some cases, less than 100 ppm. For operating conditions requiring zero leakage coefficients, ValtekSul offers the Bellows-Pac™ system.

All options of packing systems offered by ValtekSul aim to meet the current requirements, within technical specifications, requested by the market.

The specifications included in this bulletin regarding operating temperatures and pressures facilitate the correct selection of the packing configuration. Although the so-called Standard packing systems can achieve good leakage control, the characteristics of their materials and configurations are limited, not supporting more severe operating conditions, thus increasing the risk of leakage to the environment.

However, if used in process controls that do not operate with volatile organic compounds, this packing system can achieve reliable rates for long periods, always within its pressure and temperature limitations.

The Premium packings are designed to provide leakage coefficients of less than 500 ppm. However, if the design operating conditions are maintained, as well as an adequate maintenance, these packings can reach coefficients even lower than 100 ppm. The Premium packings generally have greater restrictions than Standard packings. Our lengthy operating experience in addition to the technological configuration of the stems and packing box in ValtekSul globe valves are a guarantee of a long and efficient operational life.

ValtekSul Premium packing is tested and certified to ISO 15848-1, TA-LUFT and FCI 91-1 standards.

Technology

The design architecture of the various packing models offered by ValtekSul in the extensive family of globe control valves has been recognized for decades as the most modern fugitive emissions control system on the international market.

The professional responsible for the selection, use and maintenance of any control valve, regardless of the process severity where it will be installed, must be attentive to the variety of packing systems currently available.

* EPA - Environmental Protection Agency
ppm - Parts Per Million

Packing Systems
Characteristics and Advantages

The high efficiency characteristics of the various ValtekSul's globe valve packing systems are based on technological advances such as:

Characteristics	Advantages
Separate bonnet and bonnet flange	■ As the bonnet and its flange are not built in a single piece, it allows the bonnet in its assembly to be positioned in fully alignment with the plug stem.
Plug double guided system	■ A double guided system, well spaced from each other, allows fine alignment in the plug assembly.
Uniform compression	■ The double guided system allows for uniform packing compression, preventing leakage and uneven wear.
Robust plug stem	■ The robust dimension of the plug stem, a standard in all ValtekSul control valves, with an area around 2.3 times the area of conventional valves on the market, reduces the risks of deflection in the stem, which can cause leakage, especially in control valves of large size or in operations with high pressure drops.
Deep packing box	■ Another advanced technology characteristic is the great depth of the packing housing in the valve bonnet. Due to the long strokes provided by the use of cylinder-piston actuators, a standard on all ValtekSul control valves, the distance between the lower and upper guides is greater than that provided by the stroke itself. This prevents foreign particles from damaging the upper packing assembly, which is responsible for its operational efficiency. The bottom guide has a wiper guide function.
Packing set anti-blowout rings	■ The entire packing set is protected by close-tolerance mechanical anti-blowout packing rings.
Guides of diverse manufacturing materials	■ Guides, packing spacers and anti-blowout rings are manufactured as standard material from AISI 316 stainless steel (UNS S 31600). Other materials are provided in compatibility with th fluid.
Live-load system	■ In operations with temperature and pressure gradients, as well as in valves operating with high strokes, the packing system is provided with a set of springs that provide a constant live-load in the packing.

Packing Systems
Globe Control Valves

Standard Packing Selection

ValtekSul offers three Standard packing systems for use in globe control valves:

■ **"V" Rings** ■ **Square Braided Rings** ■ **Graphite Square Rings**

Packing System	Packing Composition	Maximum Pressure[3]		Operational Temperatures [1]				Alternatives of Use	Tests Results [4]	Perfor-mance	Friction Level
				Plain Bonnet		Extended Bonnet					
		psi	bar	ºF	ºC	ºF	ºC				
"V" Rings	PTFE "V" Rings	4000	276	-100 to 400	-73 to 204	-200 to 600	-129 to 316	Standard-Double Vacuum	TV	Good	Low
	PTFEG "V" Rings	4500	310	-100 to 500	-73 to 260	-200 to 700	-129 to 371	Standard-Double Vacuum	TV	Satisfactory	Low
Square Rings	PTFE braided	4500	310	-100 to 500	-73 to 260	-200 to 700	-129 to 371	Standard-Double	TV	Good	Medium
	AFPI braided	1500	103	-60 to 800	-51 to 427	-160 to 1100	-107 to 593	Standard-Double	TV	Satisfactory	Medium
	FEP braided	3500	238	-60 to 1100	-51 to 593	-160 to 1400	-107 to 760	Standard-Double	TV	Good	High
	Graphite	4000	276	-60 to 1000	-53 to 537	-160 to 1300	-107 to 704	Standard-Double	TV	Good	High

Premium Packing Selection

ValtekSul offers three Premium packing systems for use in globe control valves:

■ **PT™ System** ■ **PTG & PTG-XT™ System** ■ **Latty Pack™ System**

Packing System	Packing Composition	Maximum Pressure[3]		Operational Temperatures [1]				Alternatives of Use	Tests Results [4]	Perfor-mance	Friction Level
				Plain Bonnet		Extended Bonnet					
		psi	bar	ºF	ºC	ºF	ºC				
PT™	Combination of: PTFE "V" rings and Carbon filaments	3000	207	-60 to 450	-51 to 232	-150 to 650	-101 to 343	Standard Standard-Double Vacuum	TV [4]	Great (below 500 ppm)	Low
PTG-XT™	Combination of: PFE "V" rings and Vespel CR6100	4000	276	-20 to 550	-29 to 288	-100 to 750	-73 to 399	Standard Standard-Double Vacuum	C [4]	Excellent (below 100 ppm)	Low
Latty Pack™	Combination of Latty 3265 LM and Latty Graf 6995 NG	4000	276	-50 to 500	-46 to 260	-150 to 700	-101 to 371	Standard Standard-Double	C [4]	Excellent (below 100 ppm)	Medium

Notes: (1) Temperature limitations applied to the body to meet packing specifications. Exceeding these limits causes an increase in the leakage coefficient, as well as a decrease in packing life expectancy.

(2) Do not use at temperatures above 800˚F (427˚C) in oxidizing services such as air or oxygen.

(3) Maximum pressure is influenced by temperature. Consult attached graphs. For applications that exceed the indicated values, consult ValtekSul Sales Engineering.

(4) The indication "TV" indicates tests carried out at ValtekSul's facilities. The indication "C" indicates certification of tests by regulatory agencies.

Packing Systems
Standard Packing - "V" Rings

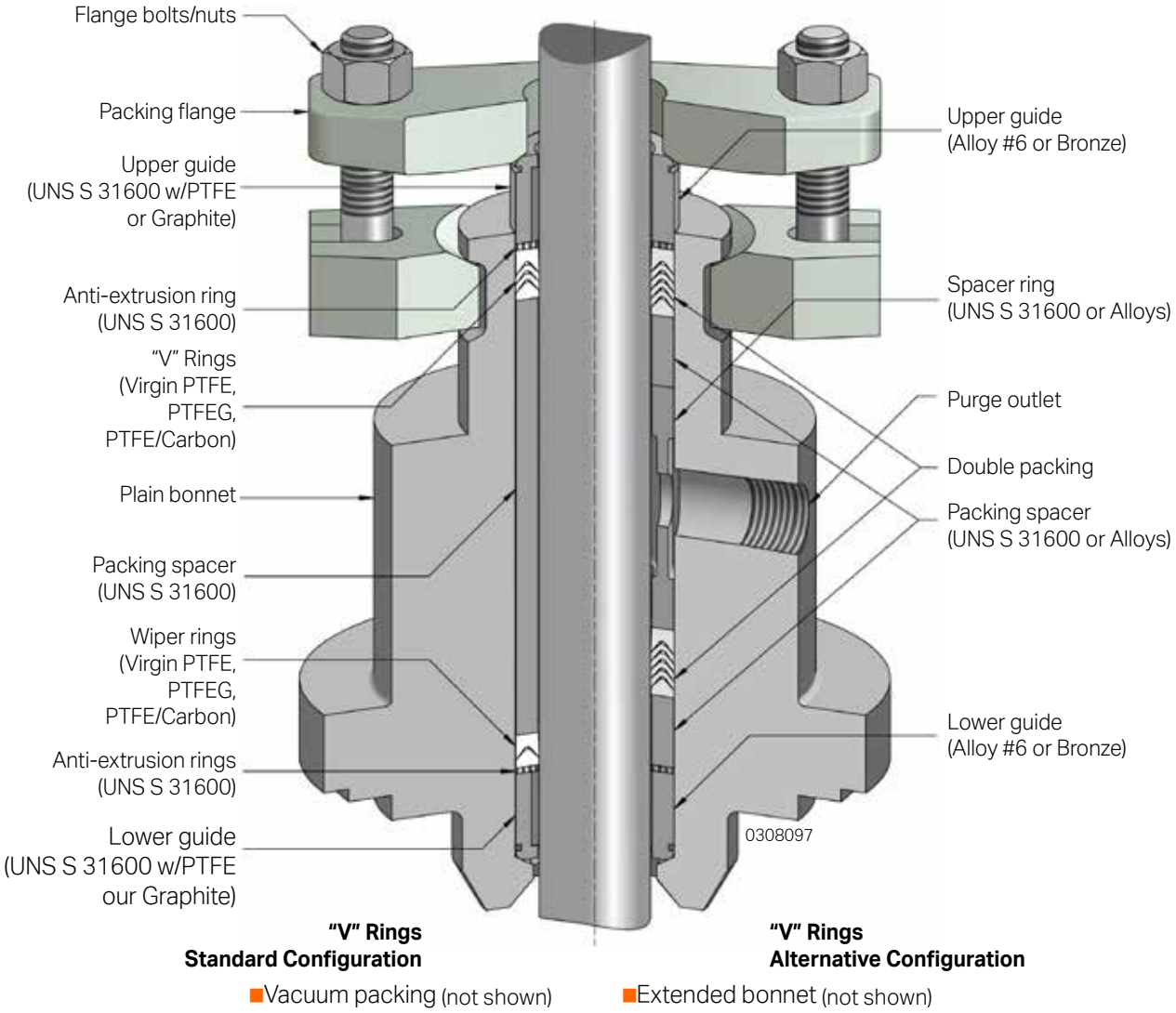

Fig. 1 - Standard Packing Configuration
"V" Rings and Optionals

ValtekSul's Standard "V" rings packing consists of a set of rings with a low coefficient of friction and long operating life.
The Standard "V" rings are made from virgin PTFE, PTFEG with glass filaments or carbon filaments. PTFE packings with glass or carbon filaments do not have the efficiency of virgin PTFE rings, however, they offer superior anti-extrusion resistance, as well as they can extend operating limits at lower or higher temperatures.
With long operational experience, this system represents the most economical solution of the entire line of packings standardized by ValtekSul.
The lower packing has a scraping and protective function for the upper packing, and thus minimize as much as possible the amount of fluid transferred to the upper packing, which is sufficiently distant from the lower one.
This packing system includes the double packing system or the packing for vacuum operations. For vacuum operations, as the atmospheric pressure is higher than the pressure inside the valve, the set is installed upside down.

Packing Systems
Standard Packing - “V” Rings

Standard Packing “V” Rings - Fig. 2

“V” PTFE
Plain bonnet

Braided PTFE
Extended bonnet

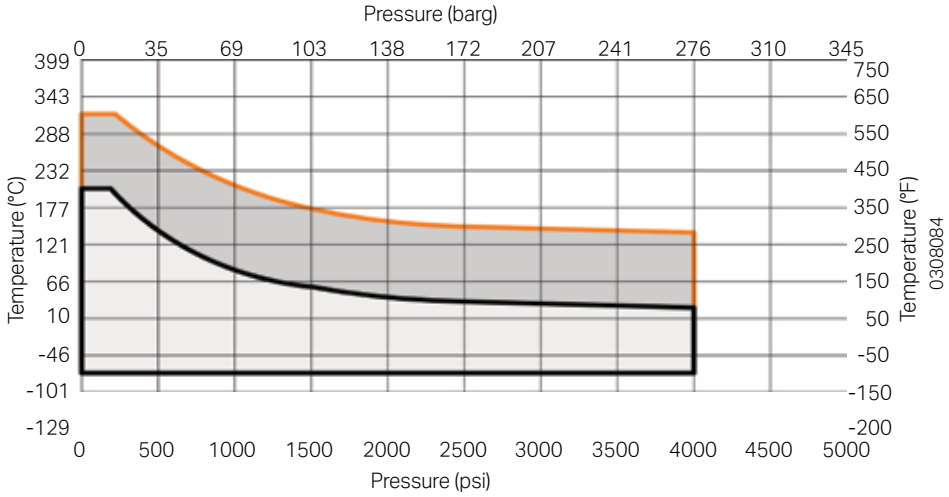

Fig. 2 - Pressure & Temperature Chart

Standard Packing Square Rings - Fig. 3

“V” PTFE
Plain bonnet

Braided PTFE
Extended bonnet

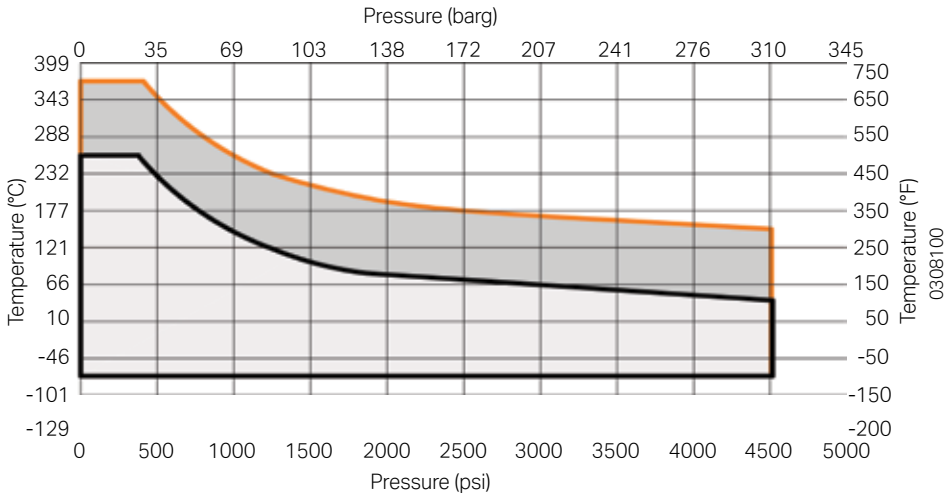

Fig. 3 - Pressure & Temperature Chart

Installation and Maintenance

The assembly of the packing set into the packing box - Fig. 1 - must be performed as follows:

1 - Assemble the cartridge-kit of the packing from the plug stem end. Assemble the entire kit and not by individual rings.

2 - Measure the plug stem diameter, as well as the diameter of the gland flange bolts, and tighten according to the torque indicated in Tab. I.

3 - Compress the packing by tightening the gland flange bolts every 1/4 turn for 4 times, alternately (right & left).

4 - For packing with glass or carbon filaments, a torque 20% greater than that indicated in Tab. I must be applied.

5 - Move the valve through its full stroke 10 times and retighten the bolts as shown in Tab. I, if necessary.

Tab. I - Torque for “V” Rings Packing

Plug Stem		Gland Flange Bol	Nominal Torque	
in.	mm	in.	Nm	in-lb
0.575	14.6	3/8	1.7	15
		1/2	2.3	20
0.890	22.6	3/8	2.0	18
		1/2	2.6	23
1.130	28.9	1/2	4.4	39
		5/8	5.5	49
1.520	38.6	1/2	5.4	48
		5/8	7.1	63
		3/4	8.5	75
2.024	51.4	1/2	7.3	65
		5/8	9.1	81
		3/4	11.0	97
2.524	64.1	5/8	11.1	98
		3/4	13.3	118
3.024	76.8	5/8	20.5	181
		3/4	24.5	217

Packing Systems
Standard Packing – Graphite Rings

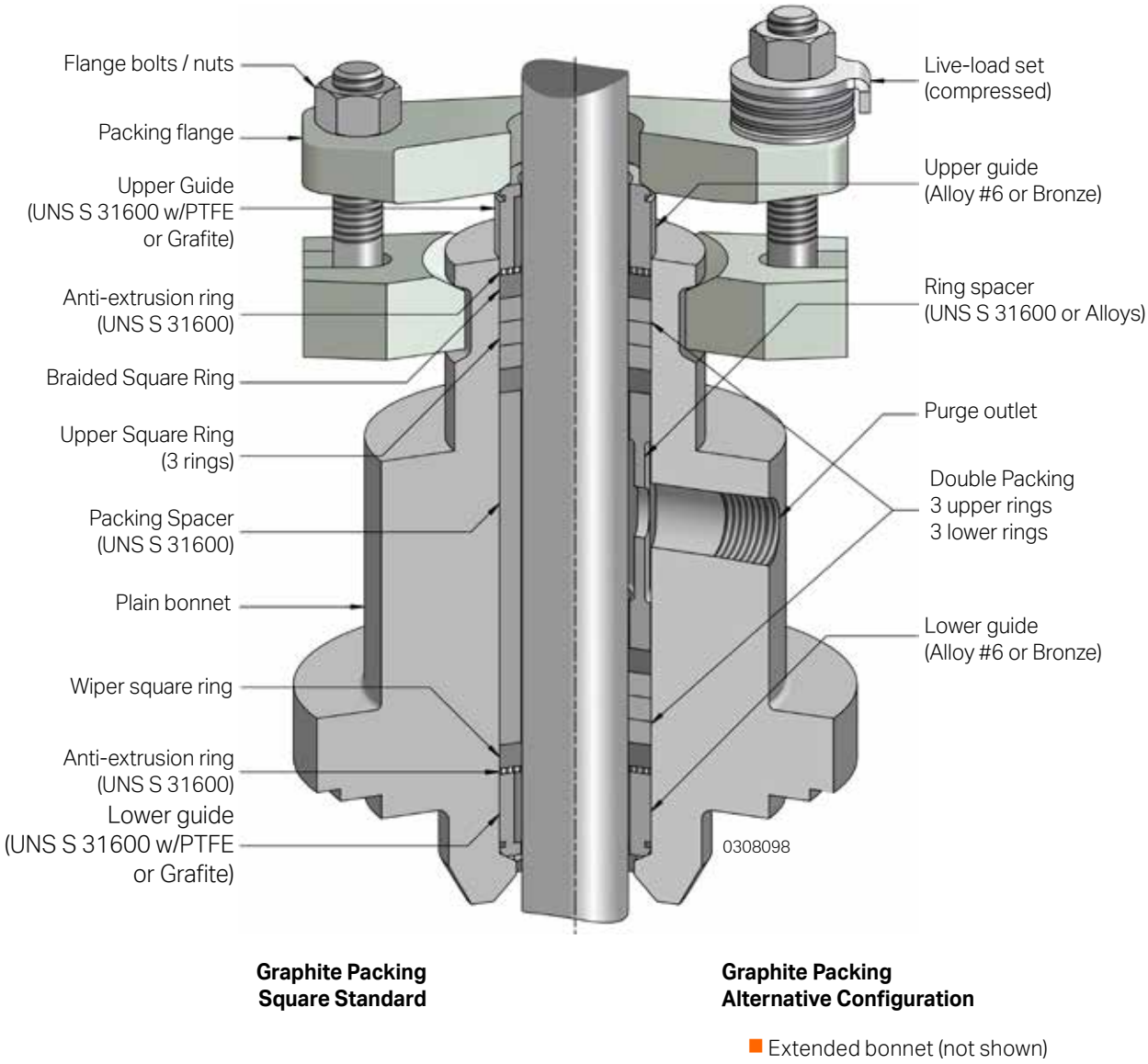

Fig. 4 - Standard and Alternative Packing Configuration
Graphite Rings

ValtekSul's Standard packing with graphite rings / molded rings consists of a set of high purity molded rings (99.5%) with reduced friction coefficients, typically high in graphite packings.
This packing is intended for use with fluids such as steam, gas and hydrocarbons, among others, and it is applicable in operations with high temperatures, including fire safety applications.

This packing model is not recommended for use in control valves with low response steps due to its friction coefficient.
This model can be used in double packing, as well as with live-load systems.

Packing Systems
Standard Packing – Graphite Rings

Standard Packing
Graphite Rings - Fig. 6

Graphite Rings
Plain bonnet

Graphite Rings
Extended bonnet

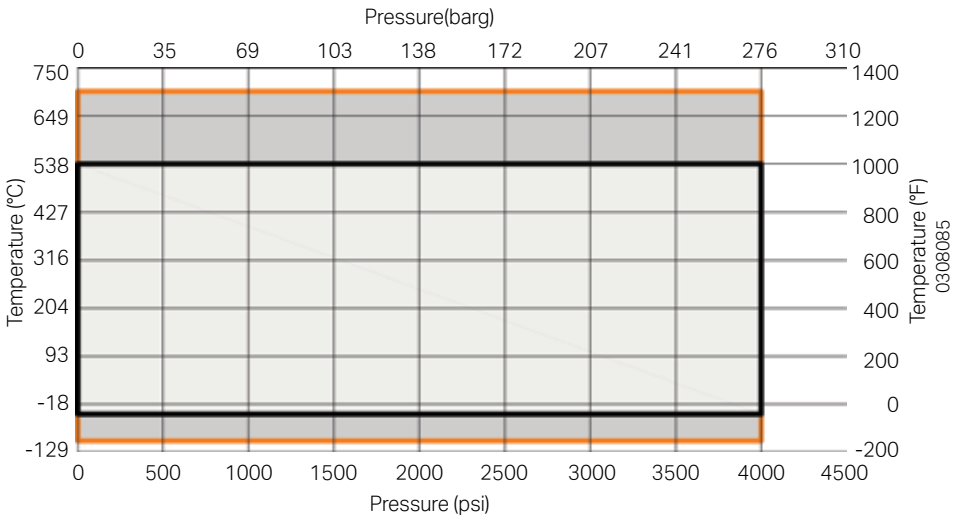

Fig. 6- Pressure & Temperature Chart

Installation and Maintenance

The assembly of the packing set into the packing box - Fig. 4 - must be performed as follows:

1 - When double packing is used, the lower packing set must be pressed down before assembling the upper set. In specific cases, ValtekSul offers information on the compression process procedure.

2 - If the live-load system is supplied, assemble according to the schematic specification provided by ValtekSul.

3 - In certain applications, where graphite packing comes into contact with the lower packing in the plug stem area, a nickel layer is applied to reduce the friction coefficient.

4 - Measure the plug stem diameter, as well as the diameter of the gland flange bolts, and tighten according to the torque indicated in Tab. II.

5 - Compress the packing by tightening the gland flange bolts, with an increment of around 25% of the lower value indicated in Tab. II, until reaching the desired torque.

6 - Move the valve through its full stroke 10 times and re-tighten the bolts as shown in Tab. II, if necessary.

7 - *This step must be performed in accordance with the user's security policy.* Once the valve is in operation and has reached operating temperature, retighten the packing bolts to the desired torque value. If leaks are detected, tighten until reaching the maximum torque indicated in Tab. II.

Packing Systems
Standard Packing – Graphite Rings

Tab. II - Torque for Graphite Rings Packing

Plug Stem Diameter		Gland Flange Bolt	ANSI Pressure Class							
			150-300-600		900		1500		2500	
			Torque Nominal							
in.	mm	in.	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm
0.575	14.6	3/8	4-5	5-6	6-7	8-9	9-11	13-15	15-18	21-25
		1/2	5-6	7-8	7-9	10-12	12-15	17-20	20-25	28-34
0.890	22.6	3/8	4-5	6-7	6-8	9-11	11-13	15-18	18-22	24-30
		1/2	6-7	8-9	9-10	12-14	14-17	20-24	24-29	33-39
1.130	28.9	1/2	10-12	13-16	15-18	20-24	25-30	34-41	43-50	59-68
		5/8	12-15	17-20	19-23	25-31	31-37	42-51	51-62	70-85
1.520	38.6	1/2	13-16	18-22	20-24	27-32	32-39	44-53	54-66	73-89
		5/8	16-20	22-27	24-30	33-40	41-49	55-66	67-82	91-111
		3/4	20-24	27-32	30-35	40-48	48-58	65-79	81-99	110-134
2.024	51.4	1/2	17-21	23-28	25-30	34-41	41-50	56-68	74-84	100-114
		5/8	21-25	29-34	31-38	42-51	52-63	70-85	87-105	118-142
		3/4	25-30	34-41	38-45	51-61	63-75	85-102	104-126	141-171
2.524	64.1	5/8	26-31	35-42	38-46	52-62	63-77	85-104	105-123	143-173
		3/4	30-37	41-50	46-54	62-74	76-91	103-124	126-153	171-208
3.024	76.8	5/8	47-57	64-77	71-86	96-117	117-142	159-193	193-235	262-318
		3/4	56-68	76-92	86-102	116-139	142-171	192-232	232-281	315-381

Packing Systems
Standard Packing – Braided Rings

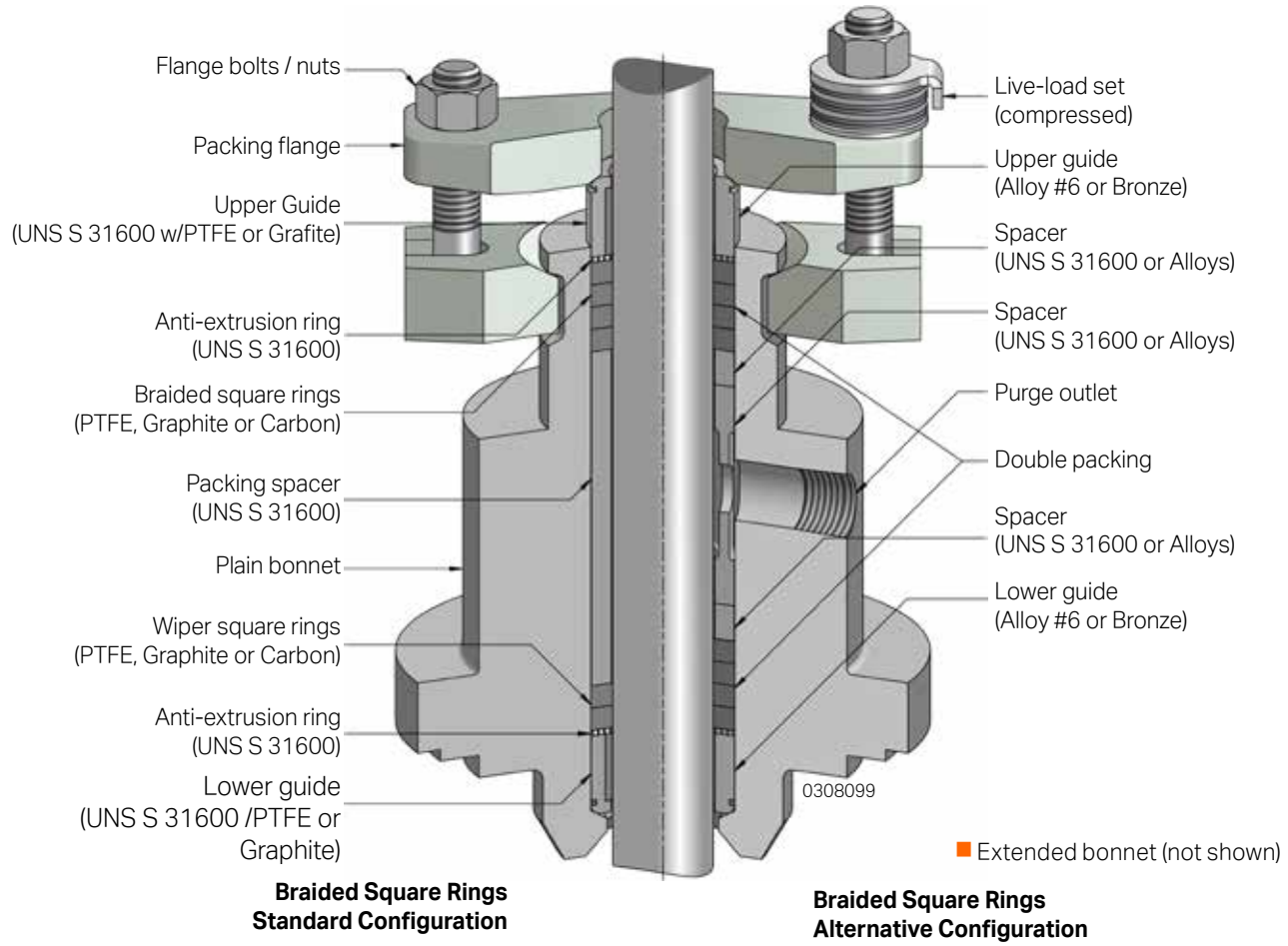

Fig. 7 - Standard and Alternative Packing Configuration
Braided Rings

The Standard square ring packing of braided configuration used in ValtekSul's globe control valves can be composed of three types of materials. Each of these three different square packing designs is used with the standard bore dimensions and bonnet depth. These square packing models achieve long operating life and can be assembled in single or double packing versions, besides the live-load version. The types of materials standardized by ValtekSul are:

Braided PTFE

This packing consists of braided, high-density continuous filaments of PTFE. It has high extrusion resistance, as well as excellent resistance to a wide range of chemicals, including fluids with suspended solids.

Braided Carbon

This packing consists of a combination of high purity, medium density carbon and Inconel™ filaments, which reinforces the anti-extrusion capability of the packing at high pressures. This square packing offers safety benefits towards high temperature fluids, without the high coefficient of friction associated with graphite molded packings. This type of packing is offered with or without a zinc corrosion inhibitor

Braided Graphite

This fireproof packing consists of a combination of high purity flexible graphite filaments encapsulated by a mesh of fine filaments of Inconel™. These wires are braided and molded into a high-density packing ring. Although they have a high coefficient of friction, they offer excellent performance in high pressure steam applications. It is recommended to harden the plug stem as a way of optimizing the sealing capacity in the valve.

Packing Systems
Standard Packing – Braided Rings

Standard Packing

Braided PTFE
Plain bonnet

Braided PTFE
Extended bonnet

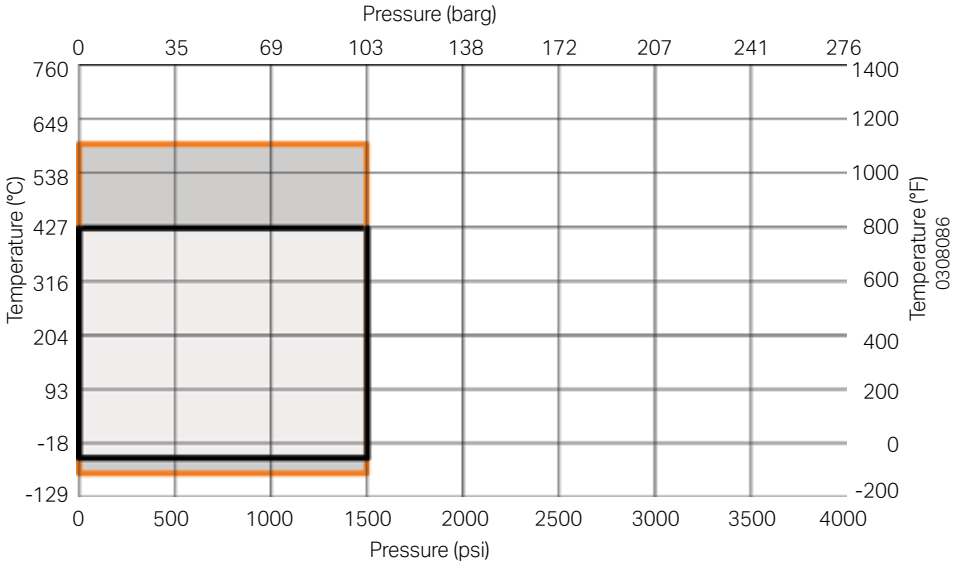

Fig. 8 – Pressure & Temperature Chart

Standard Packing

Braided Graphite
Plain bonnet

Braided Graphite
Extended bonnet

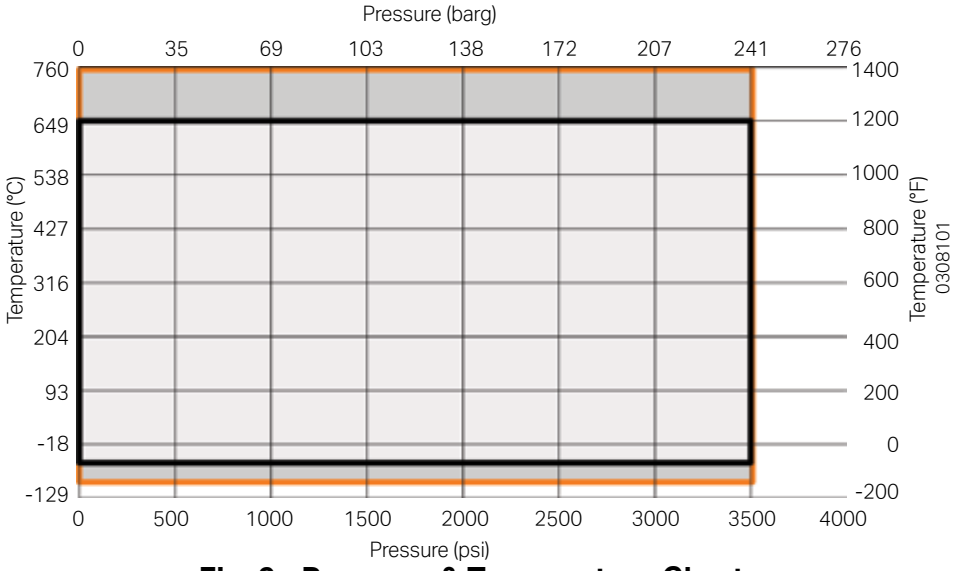

Fig. 9 - Pressure & Temperature Chart

Installation and Maintenance

The assembly of the packing set into the packing box - Fig. 7 - must be performed as follows:

1 - To reduce friction in the non-PTFE braided packing, the valve stem can be lightly coated with nickel-plated anti gripping lubricant.

2 - The angled cut of the packing braided ring must be properly overlapped with the cut of the adjacent ring offset by 90˚.

3 - For double packing, the lower packing must be compressed independently of the upper packing. If the torque is provided by ValtekSul, assemble according to the information provided by the factory.

4 - Measure the plug stem diameter, as well as the diameter of the gland flange bolts. Press the packing at the smallest value of Tab. III.

5 - Alternately compress the bolts of the packing box in increments of around 25% of the minimum torque value indicated in Tab. III, until reaching the desired torque coefficient.

6 - Move the valve through its full stroke 10 times and retighten the bolts as shown in Tab. III, if necessary.

7 - *This step must be performed in accordance with the user's security policy.* Once the valve is in operation and has reached operating temperature, retighten the packing bolts to the desired torque value. If leaks are detected, tighten until reaching the maximum torque indicated in Tab. III.

Packing Systems
Standard Packing – Braided Rings

Tab. III - Torque for Braided Rings Packing

Plug Stem Diameter		Gland Flange Bolt	150-300-600		900		1500		2500	
			Nominal Torque							
in.	mm	in.	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm
0.575	14.6	3/8	7-9	9-12	9-11	12-15	13-15	17-20	18-23	25-31
		1/2	9-10	12-14	11-13	15-18	15-18	21-25	24-29	32-39
0.890	22.6	3/8	7-9	10-12	10-12	14-16	14-17	19-23	21-25	28-34
		1/2	9-10	12-14	12-14	16-19	18-21	24-28	27-32	36-43
1.130	28.9	1/2	13-15	17-20	18-21	24-29	27-32	37-44	43-52	58-70
		5/8	15-18	20-24	21-26	29-35	33-40	45-54	52-64	71-87
1.520	38.6	1/2	15-19	21-26	21-26	29-35	33-40	45-54	54-65	73-88
		5/8	18-22	25-30	26-31	35-42	41-49	55-67	66-80	90-109
		3/4	21-26	29-35	30-37	41-50	48-58	65-79	80-96	108-130
2.024	51.4	1/2	19-23	26-31	27-32	36-44	42-51	57-69	68-83	92-112
		5/8	23-27	31-37	32-39	44-53	52-62	70-84	85-102	115-138
		3/4	27-32	36-44	38-46	52-62	61-74	83-101	102-122	138-165
2.524	64.1	5/8	27-32	37-44	39-46	53-63	63-76	85-103	103-123	139-167
		3/4	32-38	43-52	46-55	62-75	74-90	101-122	122-148	165-200
3.024	76.8	5/8	46-56	63-76	68-83	92-113	105-136	143-184	184-223	250-303
		3/4	55-66	75-90	82-99	111-134	133-162	181-219	220-267	299-362

Packing Systems
PT Premium Packing

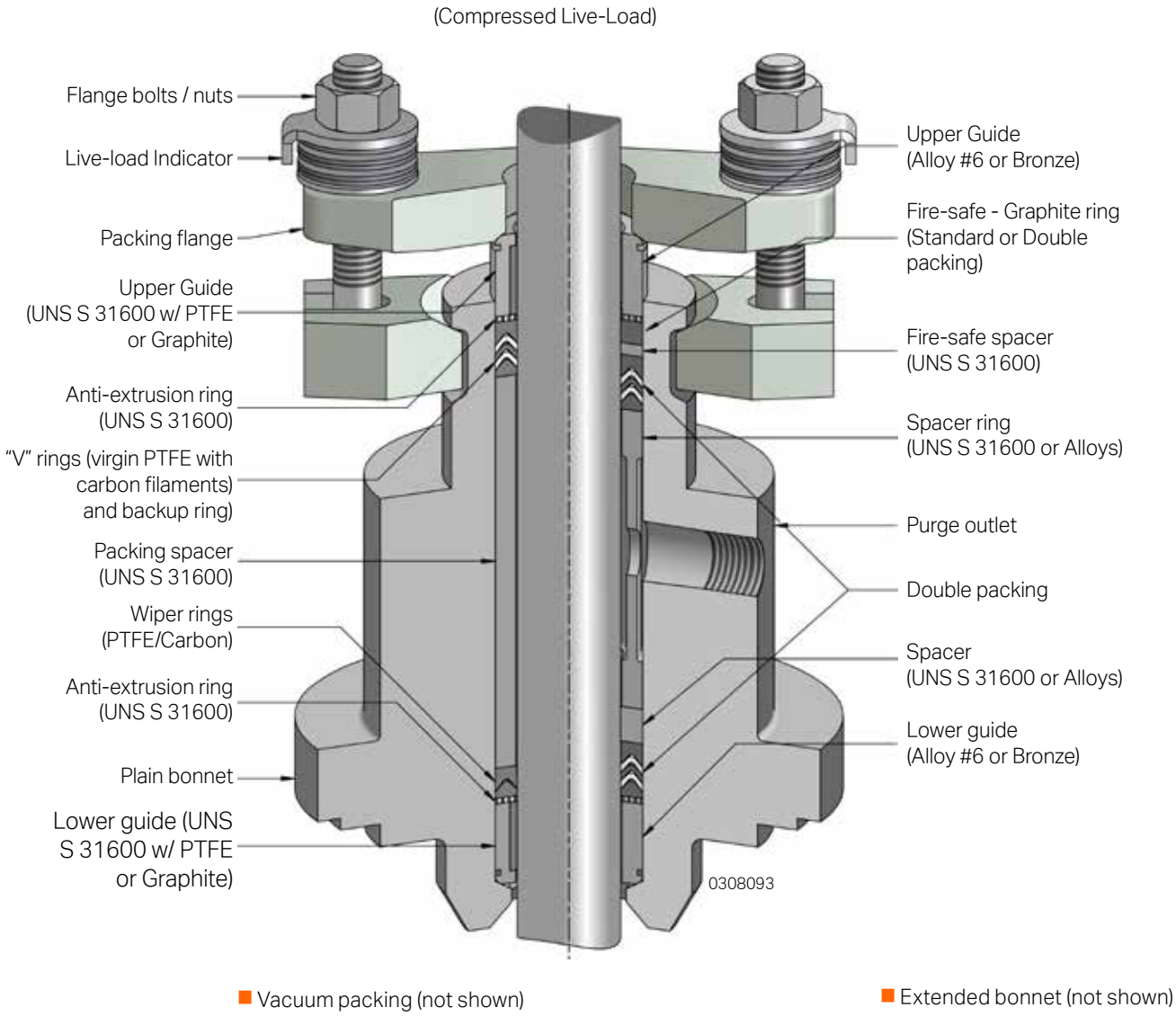

Fig. 10 - Premium Packing Configurations - PT

ValtekSul's PT live-loaded packing consists of a set of virgin PTFE "V" rings and PTFE rings with carbon fibers. This packing set was designed to reduce the adverse effects of temperature gradients due to the excellent low coefficient of friction characteristic of the PTFE. This packing set is always pressed by live-load spring systems. The live-load set has a position indicator in order to visually recall the assembly position in the maintenance process. ValtekSul's PT packing system is a more economical solution than the PTG or PTG-XT systems, within its operating pressure and temperature limitations (tab. IV). This system also supports double packing, vacuum system and extended bonnet .

Packing Systems
PT Premium Packing

Premium PT Packing Configurations

PTFE/Carbon - "V" Rings
Plain bonnet

PTFE/Carbon - "V" Rings
Extended bonnet

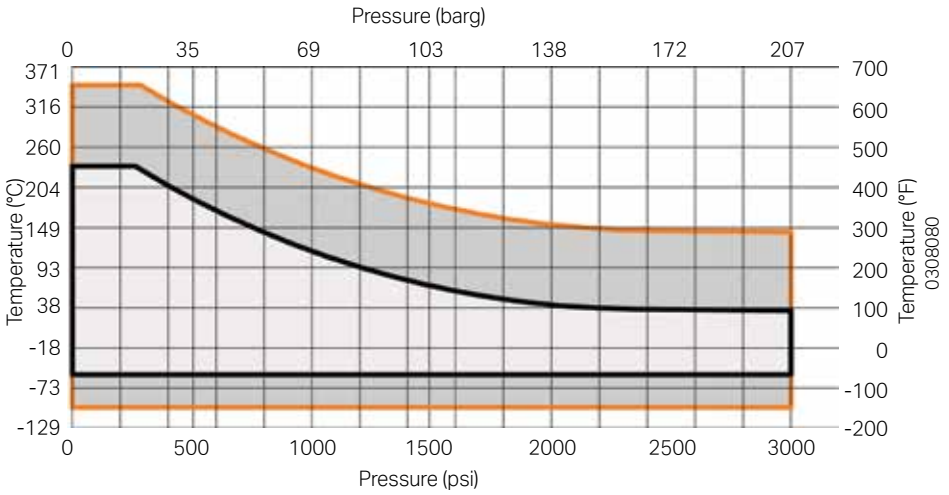

Fig. 11 - Pressure & Temperature Chart

Installation and Maintenance

The assembly of the Premium PT packing set into the packing box - Fig. 10 must be performed as follows:

1 - Assemble both packing sets in the plug stem as an entire kit and not as individual rings.

2 - The lower smaller disc of the spring button set must be installed initially. The remaining four must be installed together as shown.

3 - Position the indicator washer pointing down and contrary to the plug stem.

4 - Tighten the gland flange nuts no more than one turn at a time, alternately, until the upper indicator washer is leveled with the bottom of the adjacent lower disc.

5 - Move the valve through its full stroke 10 times and retighten, if necessary.

6 - Once the valve is in operation and an additional torque is required, tighten as indicated in Tab. IV

7 - If the lower disk of the live-load set is beneath the indicating tag of the upper washer, it is a sign that the packing is consolidated and worn. The gland flange nuts must be retightened to ensure sufficient load as indicated in step 4.

8 - If the packing is of the fire-safe type, apply a torque 20% higher than that indicated in Tab. IV.

Tab. IV - Premium PT Packing Torques

Plug Stem		Gland Flange Bolt	Nominal Torque	
in.	mm	in.	ft- lb	Nm
0.575	14.6	3/8	25	2.8
		1/2	34	3.8
0.890	22.6	3/8	29	3.3
		1/2	38	4.3
1.130	28.9	1/2	65	7.3
		5/8	81	9.2
1.520	38.6	1/2	80	9.0
		5/8	104	11.8
		3/4	127	14.3
2.024	51.4	1/2	108	12.2
		5/8	135	13.2
		3/4	162	18.3
2.524	64.1	5/8	166	18.5
		3/4	285	22.2
3.024	76.8	5/8	300	33.9
		3/4	361	40.8

Packing Systems
PTG-XT Premium Packing

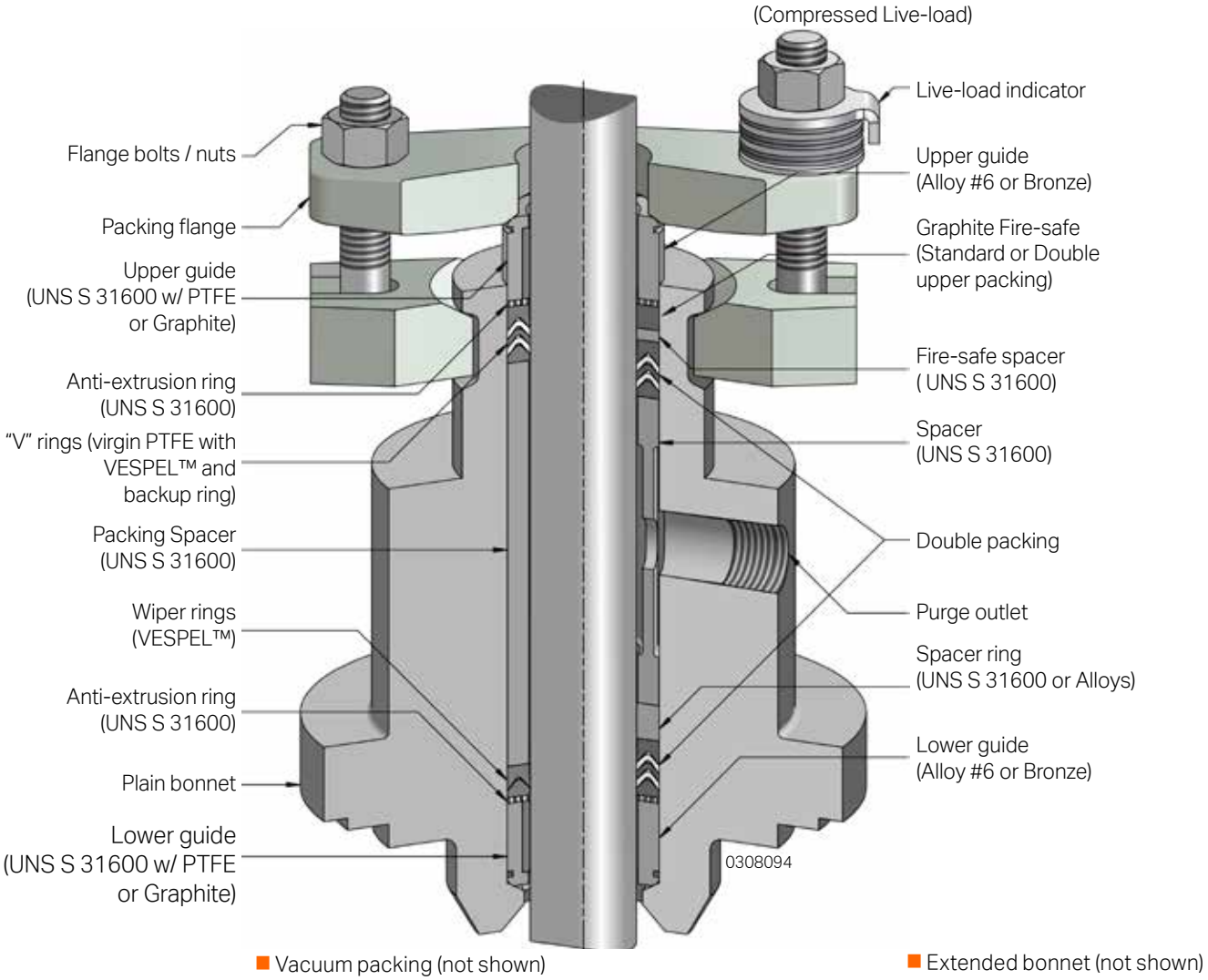

Fig. 12 - PTG-XT Premium Packing Configuration

The PTG-XT system is a Premium packing set formed by PFE "V" rings combined with Vespel CR 6100® backup rings, a high strength elastomer. This combination of advanced and modern technology results in enormous sealing capacity under conditions of high temperature and pressure gradients.
The live-load system, provided by the gland flange set of springs, is responsible for absorbing the variations caused by thermal and pressure gradients, thus reducing the need for additional tightening and maintenance. Since the PFE is an elastomer almost as chemically inert as the PTFE, it can be used in similar applications.
When the PTG-XT system is correctly installed and maintained, it achieves leakage coefficients of less than 100 ppm.
The PTG-XT system meets the ISO 15848-1Class B certification as well as the FCI 91-1 Class B1.
The PTG-XT system allows for double packing assembly with a fire-safe configuration option. It can also be installed with extended bonnets as well as for vacuum operations.
The PTG-XT system can also be installed with other approved technologies, such as the DuPont Kalrez® or the Green Tweed Chemraz®.

Packing Systems
Engaxetamento Premium PTG-XT

PTG-XT Premium Packing Configuration

PFE/Vespel CR6100®
Plain bonnet

PFE/Vespel CR6100®
Extended bonnet

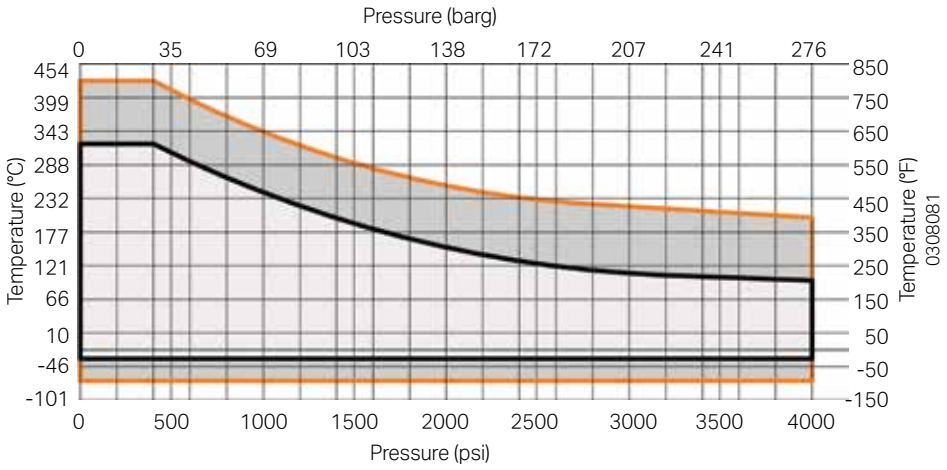

Fig. 13 - Pressure & Temperature Chart

Installation and Maintenance

The assembly of the PTG-XT Premium packing set into the packing box - Fig. 12 - must be performed as follows:

1 - Before installing the upper packing, apply a light coat of DuPont Krytox 206® Grease (recommended) around the concave center of the "V" rings, as well as in the female ring.

2 - Assemble both sets in the plug stem as an entire kit and not as individual rings.

3 - If the live-load system is supplied, assemble according to the specification provided in page 14.

4 - Measure the plug stem diameter, as well as the diameter of the gland flange bolts, and tighten according to the torque indicated in Tab. V.

5 - Compress the packing by tightening the gland flange bolts in ¼ turn, alternately and crosswise, until reaching the desired torque. For packings with live-load system, follow instructions on page 14.

6 - For fire-safe packing, a torque 20% greater than that indicated in Tab. V must be applied.

Tab. V - PTG-XT Premium Packing Torques

Plug Stem		Gland Flange Bolt	Nominal Torque	
in.	mm	in.	ft- lb	Nm
0.575	14.6	3/8	27	3.0
		1/2	37	4.2
0.890	22.6	3/8	32	3.6
		1/2	42	4.8
1.130	28.9	1/2	71	8.1
		5/8	90	10.2
1.520	38.6	1/2	88	10.0
		5/8	115	13.1
		3/4	139	15.8
2.024	51.4	1/2	119	13.5
		5/8	147	16.7
		3/4	178	20.2
2.524	64.1	5/8	180	20.4
		3/4	216	24.5
3.024	76.8	5/8	331	37.6
		3/4	398	45.2

Packing Systems
LATTYpack Control Packing System - EC™

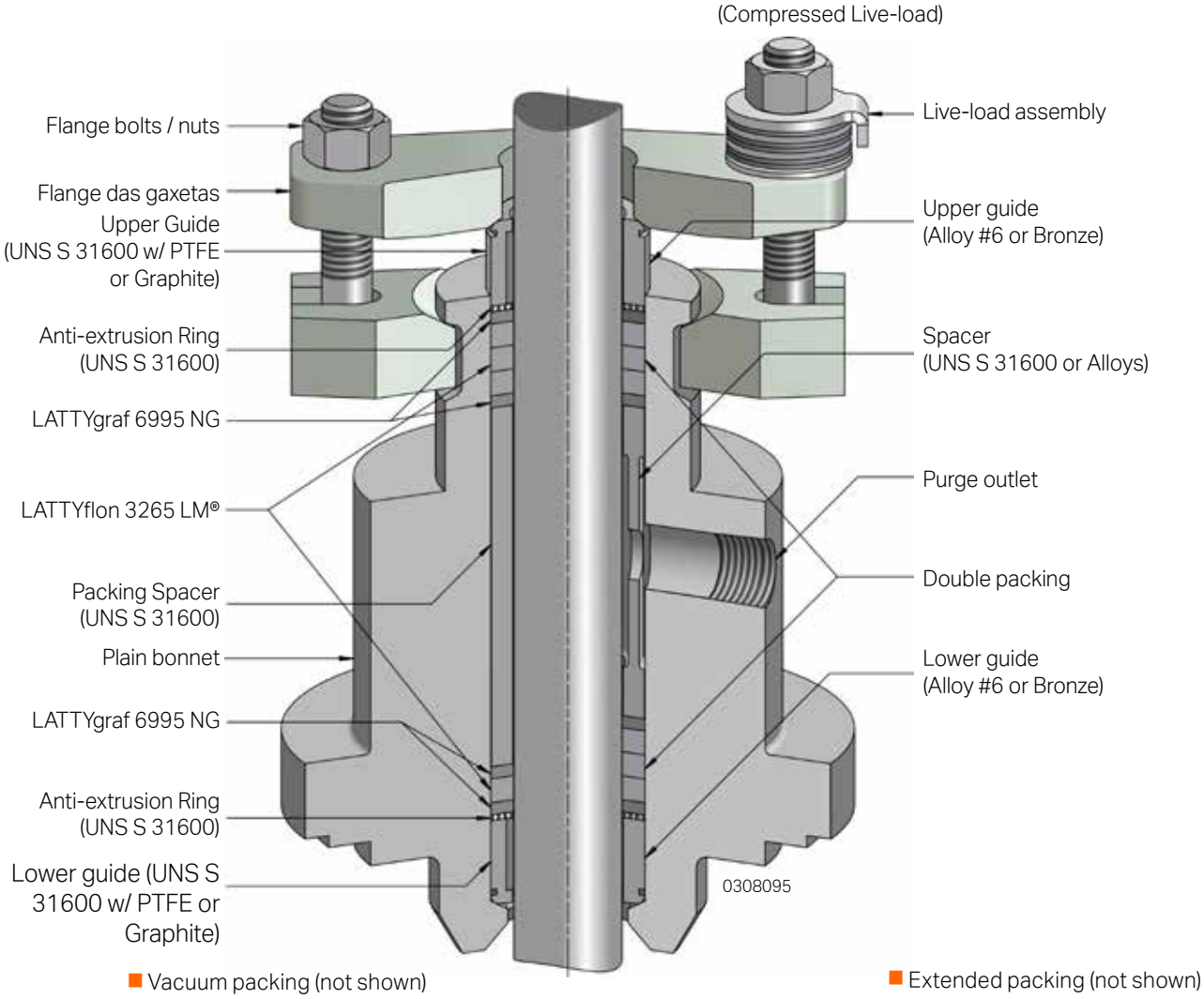

Fig. 14 - LATTYpack Control Premium Packing Configuration

The LATTYpack Control™ packing system, standardized by ValtekSul as Premium packing, uses a two-stage system to achieve low leakage coefficient in a wide range of industrial fluids. This system is composed of braided PTFE/Carbon rings and anti-extrusion molded rings with excellent levels of tightness, low levels of friction and high elastic recovery.
The LATTYflon 3265 LM® set is produced with a PTFE impregnated carbon yarn core and encapsulated by a PTFE braided jacket. Its highly elastic structure ensures tightness and low coefficients of friction and hysteresis. The LATTYflon 3265 LM® set contains a corrosion inhibitor that protects the packing surface inside the valve bonnet.
The LATTYgraf 6995 NG® packing system is made with high purity expanded graphite yarns (>99.5%) contained in an Inconel® mesh that contains an agent that improves the coefficient of friction and a corrosion inhibitor, ensuring broad protection within the valve bonnet. This system can be combined with other configurations such as the LATTYgraf EF NG or the LATTYflon 6265 M in mixed assemblies.
These systems installed on ValtekSul globe valves comply with ISO 15848-1 Class A regulations. The assembly with live-load systems that operate in thermal or fluid pressure gradients is allowed. The assembly with extended bonnets as well as with double packing is also allowed.

Packing Systems
LATTYpack Control Premium Packing - EC™

LATTYpack Control Premium Packing Configurations

LATTYpack EC®
Plain bonnet

LATTYpack EC®
Extended bonnet

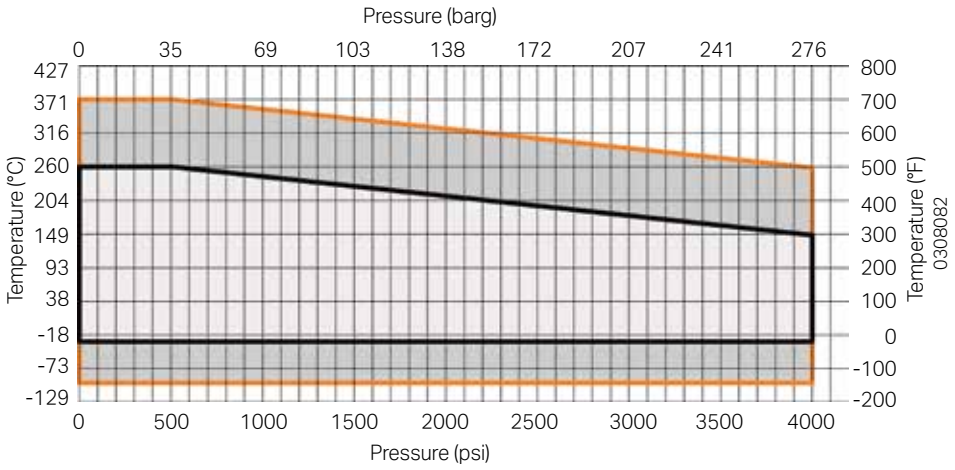

Fig. 15 - Pressure & Temperature Chart

Installation and Maintenance

The assembly of the LATTYpack Control Premium packing set - EC™ into the packing box - Fig. 14 - must be performed as follows:

1 - In double packing (twin-seal) assembly, the lower packing set must be assembled independently of the upper set, and properly tightened.

If the live-load system is supplied, assemble according to the schematic specification provided by ValtekSul.

2 - Measure the plug stem diameter, as well as the diameter of the gland flange bolts, and tighten according to the minimum torque indicated in Tab. VI.

3 - Alternate the packing tightening in increments of 25% of the lower torque value until reaching the desired torque.

4 - Move the valve through its full stroke 10 times, and retighten the set until the torque value indicated in Tab. VI, if necessary.

5 - Once the valve is in operation and has reached operating temperature, retighten the packing again, if necessary, to the maximum values indicated in Tab. VI.

Attention: the user's security protocols must be respected.

Packing Systems
LATTYpack Control Premium Packing - EC™

Tab. VI - LATTYpack Control™ Packing Torques

Plug Stem Diameter		Gland Flange Bolts	ANSI Pressure Class							
			150-300-600		900		1500		2500	
			Nominal Torque							
in.	mm	in.	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm
0.575	14.6	3/8	6-7	8-11	6-7	8-11	11-13	15-18	13-15	17-20
		1/2	9-10	12-14	9-10	12-14	14-17	19-23	16-19	22-26
0.890	22.6	3/8	7-9	9-12	7-9	9-12	12-14	16-19	13-16	18-22
		1/2	9-11	12-15	9-11	12-15	15-19	21-26	19-23	26-31
1.130	28.9	1/2	15-18	21-25	15-18	21-25	27-33	37-45	32-39	43-53
		5/8	19-24	26-33	19-24	26-33	34-41	46-56	39-47	53-64
1.520	38.6	1/2	20-24	27-33	20-24	27-33	35-43	47-58	41-49	55-67
		5/8	25-30	34-41	25-30	34-41	44-52	59-71	50-61	68-83
		3/4	30-36	40-49	30-36	40-49	51-62	69-84	60-73	81-99
2.024	51.4	1/2	27-32	36-43	27-32	36-43	44-55	60-74	52-64	71-86
		5/8	32-39	43-53	32-39	43-53	55-67	74-91	64-78	87-106
		3/4	38-46	51-63	38-46	51-63	63-80	86-108	76-93	103-126
2.524	64.1	5/8	39-47	53-64	39-47	53-64	67-82	91-111	77-94	105-128
		3/4	46-56	63-76	46-56	63-76	80-97	108-131	92-114	125-154
3.024	76.8	5/8	71-88	97-119	71-88	97-119	123-150	167-203	144-176	195-238
		3/4	86-105	116-191	86-105	116-191	146-179	198-243	170-208	231-282

Quality Management System

ISO 9001-2015
Certificate nº 31001 QM 15
DQS GmbH
DQS Brazil
ISO 14001™ Certified

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