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# Additional ATEX safety instructions for Soft Seated and PTFE Seated butterfly valves

| Ghibson "Soft & PTFE Seated" butterfly valves | |
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| **Type** | **"Concentric design"** |
| **Series** | **BVPD-BLPD- BVKI-BLKI-BFKI-BVKA-BLKA-BVKX-BLKX-BVTT-BLTT** |
| **Size** | **DN 40-800** |

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|  | **CAUTION: This additional ATEX safety manual must be read carefully before use, and then kept for consultation by the personnel involved in installation and routine and unscheduled maintenance. Such personnel must be competent, meaning made up of people with adequate training, knowledge and working experience to carry out the work entrusted to them correctly and to be aware of and eliminate any hazards.**<br>**Specifically, they must know the relevant standards, provisions, accident prevention regulations and operating conditions, and have authorisation from the safety officer to carry out the specific work required.** |

These supplementary instructions refer to the valves specified and described in greater detail in the catalogues "Butterfly Valves – Soft seated" [SS12/19] and "Butterfly Valves – PTFE seated" [TT10/18] (available online at the website www.ghibson.it), and are intended to provide all the additional information needed to use Ghibson valves correctly in potentially explosive atmospheres. The safety information contained in these additional ATEX operating instructions applies exclusively to butterfly valves. Further risks may arise when they are used in combination with other components (accessories such as actuators, sensors, etc.) or installed in a more complex system.

The installer/operator/end customer is responsible for considering these potential hazards.

**First of all, observe the generally applicable safety and accident prevention regulations, as well as the information contained in these ATEX operating instructions related to automated valves:**

**IN FACT, HAND-OPERATED VALVES (with lever or manual gearbox) ARE NOT COVERED by ATEX 2014-34-EU.**

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| **WARNING: examine the system specifications before installing the valve on or removing it from the line, or before any other procedure on the piping:**<br>▪ **make sure that there is no explosive atmosphere.**<br>▪ **identify the nature of the fluid being shut off and use appropriate protective clothing and equipment to prevent hazards and/or injuries.**<br>▪ **if necessary, make sure that the piping has cooled down properly.**<br>▪ **safely cut off the power sources to the actuator,**<br>▪ **depressurise the line and flush any fluid from it properly.**<br>▪ **to prevent mechanical damage, close the valve by hand before removing it from the line.** |  |

The warranty and liability depend on the terms and conditions contractually agreed with the end customer/installer/agent.

The installer/operator/end customer is the natural or legal person using the butterfly valve, or who provides the instruction for its use. The installer/operator/end customer must ensure that the following requirements are fulfilled:

- When assembled and connected, the butterfly valve must comply with the relevant directives.
- Only qualified personnel may have access to work on the butterfly valve.
- Personnel must have access to the operating instructions, including these additional ATEX instructions, before and while carrying out relevant work, and must follow such instructions.

- Personnel (operating and maintenance) are therefore informed and trained on all applicable safety and accident prevention regulations, and on safe installation procedures related to butterfly valve operation.
- These instructions must be clearly understood.
- Unqualified personnel may not work on butterfly valves.
- All necessary safety and accident prevention regulations must be observed while installing or carrying out maintenance on butterfly valves.

Contact Ghibson Italia S.r.l. if there are any doubts or training needs.

## "INTENDED USE"

The butterfly valves are designed for use in applications for shutting off, regulating and controlling the flow of a "fluid". The valve complete with its actuator [the **Partly Completed Machinery**] can only perform this function after it has been inserted between the flanges of a piping system, of which it will become part.

The permissible temperature or pressure limits (in relation to the materials, liner material/coating material) are provided on the butterfly valve marking plate as $\mathbf{TS_{min}}$ and $\mathbf{TS_{max}}$ (minimum and maximum permissible temperature) and **PS** (maximum permissible pressure).

The materials (liner, body and disc) MUST be compatible with the fluid in terms of corrosion resistance and system operating temperature and pressure, and must be suitable for the environmental conditions at the place of installation.

When installing in places with potentially explosive atmospheres, the following standard environmental conditions are set out in EN 80079-36:

- Ambient temperature from -20°C to +60°C
- Pressure from 80 kPa (0.8 bar) to 110 kPa (1.1 bar)
- Air with a typical oxygen content of 21% v/v.

**The installer/operator/end customer must assess any environmental conditions that differ from these.**

The installer/operator/end customer must expressly specify the intended type of use. The information provided **must be consistent** with the actual system design data (zone classification and gas and/or dust group).

The operating temperature limits of Ghibson butterfly valves vary, depending on the materials used. The ambient temperature limits (-50° C ≤ $T_{ambient}$ ≤ +80° C) are greater than those specified in the standard. Note that the standards refer to the fluid temperature except when the specifications explicitly state that the "design temperature" means the ambient temperature $T_{ambient}$.

The maximum operating temperature ($TS_{max}$) and the maximum operating pressure (PS) of the butterfly valve [in relation to the **fluid type** (to assess its aggressiveness/compatibility)] are closely linked to the materials chosen by the customer when ordering. The materials of the butterfly valve components must be selected according to the operating/installation conditions and specified in the purchase order.

**NEVER EXCEED the fluid pressure PS and temperature range $TS_{min}$–$TS_{max}$ specified on the plate of each butterfly valve.**


**The term "INTENDED USE" therefore means full compliance with the specified parameters.**

**NB**: The installer/operator/end customer must also consider that the temperature limit $T_{ambient}$ may be further restricted by the specific actuator used. **CHECK THE RELATIVE DOCUMENTATION**

Butterfly valves that are suitable for use in ATEX classified zones have a second plate in addition to the standard one. For space reasons, this additional plate contains a permitted reduction in the marking (point 11.4 - EN ISO 80079-36:2016) with **II 2GD** in accordance with ATEX Directive 2014/34/EU, followed by **Ex h X** for the indications required by the EN ISO 80079-36 standard.

For example: 

with **X** indicates that the user must read and consider these additional ATEX safety instructions, including Annex I, in order to obtain all the information needed to assess the suitability of the valve and its correct use in the specific explosive atmosphere.

Below is the key to understanding the full but generic indications. For this reason, they will be provided again in Annex I for the valve type.

**EPT[1] xx ATEX xxxx[2]**

**II 2G Ex h[3] II[4]v[5] 85°C…z°C[6](Ty[7]) Gb[8]**
**II 2D Ex h[3] III[9]C[10] 85°C…z°C[6] Db[11]**
**-50°C ≤ $T_{ambient}$[12] ≤ +80°C**

**CODING KEY**

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| 1) | "**EPT**"**-** reference to the notified body to which the Technical File related to the ATEX Directive has been submitted. |
| 2) | "**xx ATEX xxxx**"**-** Tech. File reference number: **14 ATEX BVSS-2020** |
| 3) | "**h**"**-** is the symbol used for non-electrical equipment **with "c" constructional safety protection** in accordance with EN ISO 80079-37:2016. |

Ghibson butterfly valves are suitable for use in ATEX 1 and 21 zones (and therefore also 2 and 22) with some restrictions that can be specified with the following symbols:

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| 4) | "**II**"**-** indicates the "Explosion group": this symbol is used for equipment that is suitable for explosive gas atmospheres. |
| 5) | "**v**"**-** Ghibson valves may be restricted to use with group **IIB** or **IIA** gases. The discriminating factor is the thickness of the paint or disc coating, if any:<br>- for unpainted valves (stainless steel of bronze-aluminium body) or those with standard painting (60-80 µm thick) or no coating → thickness < 0,2mm→ no restrictions → **IIC/IIB/IIA** indiscriminately.<br>- for coated discs or valves with special painting (200 µm ≤ thickness < 2mm) → **IIB / IIA restrictions: Group IIC gases such as hydrogen, acetylene, carbon disulphide, etc.) are therefore EXCLUDED**.<br>- for thickness ≥ 2mm → only **Group IIA gases**<br>**THE VALVES ARE NEVER SUITABLE FOR FLAMMABLE AND CHEMICALLY UNSTABLE GASES (i.e. flammable gases capable of explosive reactions even without air or oxygen) and HYBRID MIXTURE.** |
| 6) | "**z°C**"**-** as already explained, the maximum surface temperature of the valve depends on the fluid temperature and environmental conditions. "**z**" is therefore variable, and its upper limit will depend on the liner, |

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| | except in valves with aluminium bodies. See Table 1 below and Annex I. |
| 7) | **"Ty"-** the maximum surface temperature of the valve depends on the fluid temperature and environmental conditions. **Ty** is therefore variable, and its upper limit will depend on the liner (**$T_{liner\ max}$**), except in valves with aluminium bodies. See Table A and Annex I.<br>Conversely, the minimum temperature is only given on the standard plate. The PED refers to the fluid temperature when it states that the choice of materials depends on their mechanical properties: some CANNOT be used for temperatures < -10°C, for example GJS-400-15 cast iron, while others must undergo the Charpy test (Resil. ≥ 27J at $T_{min\ required}$). |
| 8) | "**Gb**"**-** indicates the "EPL - Equipment Protection Level" of Ghibson valves in relation to gaseous atmospheres. It indicates that they are suitable for Zone 1 and therefore also Zone 2 (inside/outside).<br>**They cannot be used in Zone 0**. |
| 9) | "**III**"**-** indicates the "Explosion group": this symbol is used for equipment that is suitable for explosive dust atmospheres. |
| 10) | "**C**"**-** indicates that Ghibson valves can also be used with conductive dusts. |
| 11) | "**Db**"**-** indicates the "EPL - Equipment Protection Level" of Ghibson valves in relation to dust atmospheres.<br>It indicates that they are suitable for Zone 21 and therefore also Zone 22 (inside/outside).<br>**They cannot be used in Zone 20**. |
| 12) | "**$T_{ambient}$**"**-**: ambient temperature range.<br>• Some system specifications require a "low design temperature" explicitly due to the minimum ambient temperature (**$T_{ambient\ min.}$**), regardless of the fluid temperature. In this case, **$TS_{min}$** (generally the worst case from the metal used and the liner elastomer) must be: **$TS_{min} \leq T_{ambient\ min.}$**<br>• The maximum ambient temperature (**$T_{ambient\ max.}$**) is specified as 80°C for the valves.<br>**THE ACTUATOR MAY LIMIT THIS RANGE** |

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| **PROHIBITION: DO NOT USE Ghibson butterfly valves in Zone 0 and Zone 20 classified explosive atmospheres, either inside or outside.** |  |

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|  | **PROHIBITION: <u>DO NOT use</u> Ghibson butterfly valves with:**<br>• **<u>hybrid mixtures</u> (hybrid mixtures are mixtures of air and flammable substances in different material states).**<br>• **<u>chemically unstable gases</u> (flammable gases capable of explosive reactions even without air or oxygen)** |
| **PROHIBITION: <u>DO NOT use</u> Ghibson butterfly valves with special paint thicknesses or coated discs when:**<br>• **thickness ≥ 0,2 mm and the explosive atmosphere contains Group IIC gases.**<br>• **thickness ≥ 2 mm and the explosive atmosphere contains Group IIB gases.** |  |

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|  | **WARNING: The installer/user is responsible for ensuring strict compliance with the system specifications and for taking measures or using devices to prevent adiabatic compression and shock waves.** |
| **WARNING: The user must assess whether the fluid/liquid being shut off can give rise to electrostatic charges in the liner or in the piping if it is made of plastic.** |  |

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|  | **WARNING: The installer/user must make a new risk assessment in the event that a subsequent coat of paint is applied to the valve/pipe with reference to the classification of gas groups present in the explosive atmosphere.** |

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| **CAUTION: as also indicated in the ATEX guidelines, the installer must ensure that the components, initially compliant, are still compliant when they are put into service. For this reason he must carefully follow all the installation instructions of the various manufacturers.**<br>**The user must demand and verify that these instructions have been followed.** |  |

**Table 1 – GAS - Maximum surface temperatures and $T_{fluid}$**

| LINER | $T_{liner\ max}$ | | T - class | $T\ Surf._{max}$ in relation to $T_{fluid}$ | With aluminium body EN AC / EN AB 46400 | T - class | $T\ Surf._{max}$ with aluminium body EN AC / EN AB 46400 |
|---|---|---|---|---|---|---|---|
| NR - NATURAL RUBBER | 80° | Ty=T6 | T6 | 80°C | Ty=T6 | T6 | 80°C |
| PU - POLYURETHANE® | 90° | T6...T5 | T6 | 85°C | T6...T5 | T6 | 85°C |
| | | | T5 | 90°C | | T5 | 90°C |
| NBR - BUNA®<br>CO - CARBOXYLATE<br>CR - NEOPRENE® | 100° | T6...T5 | T6 | 85°C | T6...T5 | T6 | 85°C |
| | | | T5 | 100°C | | T5 | 100°C |
| CSM - HYPALON® | 125° | T6...T4 | T6 | 85°C | T6...T4 | T6 | 85°C |
| | | | T5 | 100°C | | T5 | 100°C |
| | | | T4 | 125°C | | T4 | 125°C |
| EPDM<br>White EPDM | 130° | T6...T4 | T6 | 85°C | T6...T4 | T6 | 85°C |
| | | | T5 | 100°C | | T5 | 100°C |
| | | | T4 | 130°C | | T4 | 130°C |
| HT EPDM | 135° | T6...T4 | T6 | 85°C | T6...T4 | T6 | 85°C |
| | | | T5 | 100°C | | T5 | 100°C |
| | | | T4 | 135°C | | T4 | 135°C |
| MVQ - SILOPREN®<br>PTFE - TEFLON® | 190° | T6...T3 | T6 | 85°C | T6...T3 | T6 | 85°C |
| | | | T5 | 100°C | | T5 | 100°C |
| | | | T4 | 135°C | | T4 | 135°C |
| | | | T3 | 190°C | | T3 | 150°C |
| FKM - VITON® | 200° | T6...T3 | T6 | 85°C | T6...T3 | T6 | 85°C |
| | | | T5 | 100°C | | T5 | 100°C |
| | | | T4 | 135°C | | T4 | 135°C |
| | | | T3 | 200°C | | T3 | 150°C |

**Using valves at temperatures lower than $TS_{max}$ will therefore result in a lower temperature class, making the valve suitable for more "critical" explosive atmospheres.**

**For example, Table 1 shows that an aluminium valve ($TS_{max}$ 150°C) with an EPDM liner ($TS_{max}$ 130°C) will have $TS_{max}$ = 130°C, which corresponds to temperature class T4.**

**However, as already said, the surface temperature of the valve is due exclusively to the fluid (for example $T_{max}$ 100°C) and environmental conditions ($Ta_{max}$ 80°C). <u>These conditions</u> result in a temperature class of T5, meaning it can also be used with a more demanding atmosphere.**

## TEMPERATURE CLASSES (GAS)

Maximum equipment surface temperature achievable for potential use in an explosive gas atmosphere.

| T-classe | Massima temperatura Superficiale | Minima temperatura di accensione del gas |
|---|---|---|
| T1 | 450 °C | >450 °C |
| T2 | 300 °C | >300 - ≤450 °C |
| T3 | 200 °C | >200 - ≤300 °C |
| T4 | 135 °C | >135 - ≤200 °C |
| T5 | 100 °C | >100 - ≤135 °C |
| T6 | 85 °C | >85 - ≤100 °C |

**WARNING: gases may have different ignition temperatures, even though they belonging to the same group.**

**Some examples:**

| Gruppo | Tipo GAS | Temperatura di accensione |
|---|---|---|
| A | Acetone | 540 °C |
| | Acido acetico | 485 °C |
| | Ammoniaca | 630 °C |
| | Etano | 515 °C |
| | Cloruro di metilene | 556 °C |
| | Metano (CH4) | 595 °C |
| | Ossido di carbonio | 605 °C |
| | Propano | 470 °C |
| | n-butano | 365 °C |
| | n-butile | 370 °C |
| | Idrogeno solforato | 270 °C |
| | n-esano | 240 °C |
| | Acetaldeide | 140 °C |
| | Etere etilico | 170 °C |
| | Nitrito di etile | 90 °C |
| B | Etilene | 425 °C |
| | Ossido di etile | 429 - 440 °C |
| C | Acetilene (C2H2) | 305 °C |
| | Bisolfuro di carbonio | 102 °C |
| | Idrogeno (H2) | 560 °C |

## Table 2 – DUST - Maximum surface temperatures and $T_{fluid}$

| LINER | "Temperature range" generic | T Surf.max | "Temperature range" With aluminium body EN AC / EN AB 46400 | T Surf.max With aluminium body EN AC / EN AB 46400 |
|---|---|---|---|---|
| NR - NATURAL RUBBER | **80°C** | **80°C** | **80°C** | **80°C** |
| PU - POLYURETHANE® | **85°C…90°C** | **90°C** | **85°C…90°C** | **90°C** |
| NBR - BUNA®<br>CO - CARBOXYLATE<br>CR - NEOPRENE® | **85°C…100°C** | **100°C** | **85°C…100°C** | **100°C** |
| CSM - HYPALON® | **85°C…125°C** | **125°C** | **85°C…125°C** | **125°C** |
| EPDM & White EPDM | **85°C…130°C** | **130°C** | **85°C…130°C** | **130°C** |
| HT EPDM | **85°C…135°C** | **135°C** | **85°C…135°C** | **135°C** |
| MVQ - SILOPREN®<br>PTFE - TEFLON® | **85°C…190°C** | **190°C** | **85°C…150°C** | **150°C** |
| FKM - VITON® | **85°C…200°C** | **200°C** | **85°C…150°C** | **150°C** |

**Note:**

In its deposited form (layers), dust has a different ignition temperature than in its mixed form (cloud).

The permissible surface temperature for those parts of systems, equipment and components exposed to dust is determined by introducing a safety factor [subtracting 75 K (Tperm L = Tmin L - 75 K) from the value determined for the dust layer, and multiplying the value determined for the dust cloud by 2/3 (Tperm C = 2 / 3Tmin C). The smaller of the two values calculated in this way is the lowest permissible surface temperature of the equipment].

No temperature classes have been defined for dusts. Comprehensive tables like the one below are available, but they are UNOFFICIAL.

| LINER | $T_{liner\ max}$ permissible service |
|---|---|
| NR - NATURAL RUBBER | **+80°C** |
| PU - POLYURETHANE® | **+90°C** |
| NR - NATURAL RUBBER | **+100°C** |
| CO - CARBOXYLATE | |
| CR - NEOPRENE® | |
| CSM - HYPALON® | **+125°C** |
| EPDM/White EPDM | **+130°C** |
| HT EPDM | **+135°C** |
| MVQ - SILOPREN® | **+190°C** |
| PTFE - TEFLON® | |
| FKM - VITON® | **+200°C** |

**DUSTS**

**Some examples of dust ignition temperatures (varies by consistency and nature)**

| Polveri | Nubi | Spessore di 5 mm |
|---|---|---|
| Alluminio | 560 °C | >450 °C |
| Carbone di legna | 520 °C | 320 °C |
| Polvere di carbone | 380 °C | 225 °C |
| Cacao | 590 °C | 250 °C |
| Fondi di caffé | 580 °C | 290 °C |
| Mais | 530 °C | 460 °C |
| Cellulosa metilica | 420 °C | 320 °C |
| Resina fenolica | 530 °C | >450 °C |
| Polietilene | 440 °C | fusioni |
| PVC | 700 °C | >450 °C |
| Zucchero | 490 °C | 460 °C |
| Fuliggine | 810 °C | 570 °C |
| Amido | 460 °C | 435 °C |
| Toner | 520 °C | fusioni |
| Frumento | 510 °C | 300 °C |

Because of the previous considerations, with **$Ta_{max}$ = 80°C** and no radiation, the highest surface temperature of piping carrying a fluid at 200°C will be 200°C. Considering the UNOFFICIAL data in the above table, the dusts indicated are not subject to ignition as the lower of the two values given for each line is higher than 200°C.

**WARNING: The operator/end customer must assess the above risks.**

**PROHIBITION: never exceed the service temperature limits specified for butterfly valves. Monitor the temperature if the process is critical (if the valve must work close to one of the limits)**

**CAUTION: It is clear that the ATEX Directive only considers valves that are <u>ACTUATED</u> [*] and are therefore operated by a pneumatic, hydraulic or electric actuator. <u>This means that the usage restrictions applied by the installer/operator/end customer must be based on the worst-case data plate values from the valve and actuator expressly</u>**

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| | **chosen/used.**<br>**[*] ATEX Directive 2014/34/EU does NOT cover hand-operated valves.** |
| **WARNING: all accessories used to complete the installation (specifically with an electric actuator that needs cables, cable glands, etc.) must also be suitable for installation in classified zones, and the installer/operator/end customer must consider whether these accessories will introduce usage restrictions.** |  |
|  | **CAUTION: The safety regulations applicable to butterfly valves, control systems and actuators are the same as those for the piping system in which they are installed.** |

The valve complete with actuator (partly completed machinery) must be installed in accordance with the procedures below and the recommendations in the following documents:

- Check the technical documentation for the system in which the valve will be installed in order to assess its suitability in terms of safety and performance.
- Check that the butterfly valve is suitable for the explosive atmosphere.
- To install, operate and maintain the valve correctly, follow the instructions in the manual for the "bare axis" valve, supplied with each valve.
- Follow these additional ATEX safety instructions when installing in an explosive atmosphere.
- Follow the instructions in the specific manual provided by the actuator manufacturer (the actuator may already be fitted on the valve).

As mentioned, if there is an actuator, consider the electrical and/or pneumatic and/or hydraulic supply (voltage/frequency of motors or solenoids, air or hydraulic fluid pressure and flow rate) and other installation conditions, which can be found on the actuator plate and/or in its installation and maintenance instructions.

The system design must eliminate hazards arising from these energy sources by providing safe cut-off devices. **If there is a compressed air supply, make sure that it does not contain components or particles that could increase the explosion risk, and monitor its temperature**.

The specialist installation personnel must have technical and regulatory training. When installing electrical cables, for example, they must check that the voltage and frequency matches those on the plate. This is important to eliminate the risk of eddy currents or potential differences between system devices causing electrocution or igniting explosive atmospheres.

Before any disassembly work, always disconnect external power sources (electrical, pneumatic, hydraulic), following the actuator service instructions and, where necessary, allowing sufficient time to ensure safe conditions (e.g. to let a pipe cool down).

For actuators with energy storage (e.g. springs), take great care and strictly follow the service instruction to avert hazards related stored energy (the springs themselves in the example).

**The operator/end customer is responsible for assessing the site-specific risks and adding layout instructions where applicable.**

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| **PROHIBITION: any change in configuration or use other than that specified in the standard operating instructions and these additional ATEX instructions (failure to comply with the "Intended Use") is considered improper and unintended use of the butterfly valve!**<br>**This constitutes, at least, an act of gross negligence and Ghibson Italia S.r.l. shall not be held liable for damage arising from such use.** |  |
|  | **PROHIBITION: do not carry out any modifications without consulting the Ghibson Engineering Department.**<br>**Such modifications may introduce hazards for both the installation personnel and the end user, and may involve the system and the environment.**<br>**For this reason, unauthorised modifications shall be considered tampering, and will therefore immediately annul the statutory guarantee and automatically relieve Ghibson Italia S.r.l. of any liability.** |

- Before installation, make sure that the fluid is compatible with the valve material (both chemically and in terms of temperature limits) and with the potentially explosive atmosphere.

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| **PROHIBITION: in explosive atmospheres, the piping can only carry "fluids/dust clouds" that are not subject to electrostatic charge build-up: the "fluid/dust cloud" specific contact resistance must be less than $10^8$ Ω (Ohm).** |  |

- Visually inspect the liner to ensure it is in good condition since the seal is guaranteed by the interference between the disc and the liner.
- Plane scheduled inspections/maintenance to check the changes in liner thickness as its wear depends on valve operation.

- As for a “Safe Area” installation, check the piping connection flanges and clean them if necessary.
- Check that the valve and piping are properly aligned. The piping must be well supported to prevent mechanical stress and vibration.
- Since foreign objects such as pieces of metal in the piping could lead to the hazard of igniting an internal explosive atmosphere, they must be prevented upstream with a very high level of reliability.

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| **WARNING: the owner/operator must assess this risk as it is entirely related to operating circumstances.**<br>**The valve (IP65 min.) does not allow foreign objects to enter the piping except due to the installer’s negligence during installation.** |  |

- As already stated, the paint and disc coating thicknesses are factors that restrict the use of Ghibson valves. With increased thicknesses of paint or disc coating, the use of Ghibson valves is limited to group IIB gases or even to group IIA only. Such special solutions must therefore be agreed in advance in order to avoid introducing additional risks that were not initially assessed.
- Do not use compressed air to clean layers of dust deposited on the valve or in general on the piping as blowing could create dust vortices that form an explosive atmosphere.
- Increase the cleaning frequency if the dust deposits tend to be very substantial.

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|  | **PROHIBITION: do not allow dust deposits to become more than 1 mm thick.**<br>**Processes that involve creating high electrostatic charges are not permitted in outdoor environments.** |

- Remove dust layers regularly to prevent ignition and to ensure the butterfly valve can dissipate heat properly (where applicable) to the surrounding environment.
- Regardless of the installation type (safe area or classified area), carry out both visual and functional checks regularly to ensure that the disc moves smoothly and there is no seepage in the closed position.

# Valve and actuator installation information

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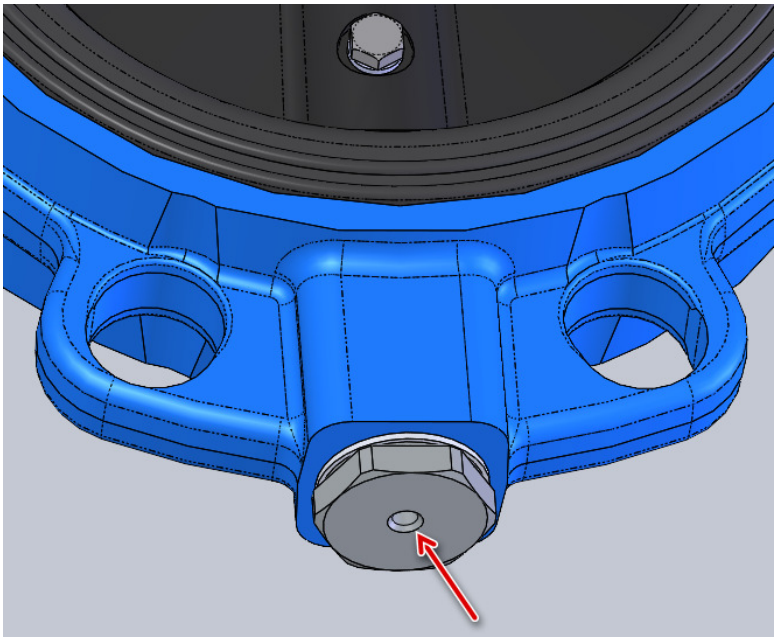
| **WARNING: The installer must be qualified to install pneumatic and/or hydraulic and/or electrical devices and know the national regulations to be observed.** |  |

The operator/end customer shall provide the installer with all the documents from the individual manufacturers, so that all three "players" can assess the suitability of the components for use in the specific potentially explosive atmosphere.

- The actuators must not exceed the torque limit of the butterfly valve or must be able to stop (torque limiters) if this limit is exceeded.
- Choose actuators that ensure the valve moves with a peripheral speed not exceeding 1 m/s.
- Make sure there is good electrical conductivity between the valve, the piping and the earthing system (equipotential) also using the dedicated connection point (M6x1 hole) in the lower valve plug.



- For electric actuators/accessories (individually compliant with 34/2014/EU), the properly qualified installer must:
  - Connect the actuator, accessories and valve properly to the earthing system.
  - Test the earth resistance of the connections made.

- The energy sources (pneumatic. hydraulic and electrical) must have suitable cut-off devices that can be locked by the installer/maintenance technician to prevent unintentional/unwanted actuator movements.
- Check the operation of each valve/actuator after the first installation.

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|  | **PROHIBITION: Do not put the valve and actuator into service before the final system/machine in which it is incorporated has been declared compliant with all relevant directives.** |

It is conceivable that a user could retrofit a manual valve with an actuator:

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| ***WARNING/HAZARD: in an application requiring installation in an ATEX classified zone, a manual valve can be retrofitted with an actuator, but it requires a complex analysis of the resulting risks regardless of whether the valve and actuator are individually suitable for the specific potentially explosive atmosphere.*** |  |

- ✓ first of all, analyse the valve data sheet, especially the torque specified by the manufacturer for the application, and overdimension it with a reasonable factor without exaggerating. **Consult the manufacturer for further information**.
- ✓ assess the operating limits resulting from the valve and actuator combination. The "worst case" will determine the possible usage conditions of the assembly and whether it is suitable for use or not.

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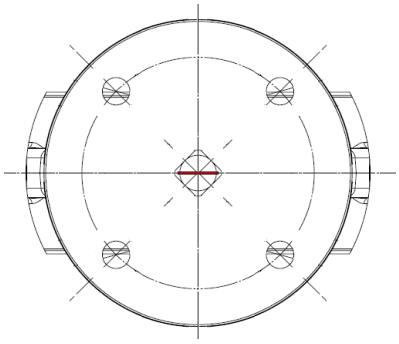
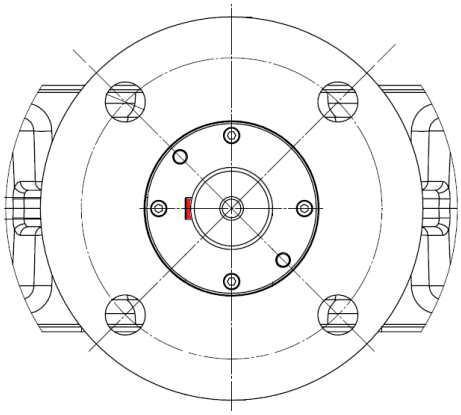
|---|---|
| | **CAUTION: by convention, closure normally occurs with clockwise rotation and, unless otherwise specified, the factory normally fits the actuator in parallel with the valve body.**<br>**The installation and maintenance instructions for the partly completed machinery are based on these conventions.** |

**Before installing valve in or removing from the line, or before carrying out any disassembly, consider these characteristics and establish the disc position (visual indicator on the actuator or on the limit switch box, if any).**

**If the valve is in the "bare axis" configuration because the actuator has already been removed, establish its position using the "notch" (mechanical machining on the pivot) at the top end of the pivot, which is parallel to the disc faces.**

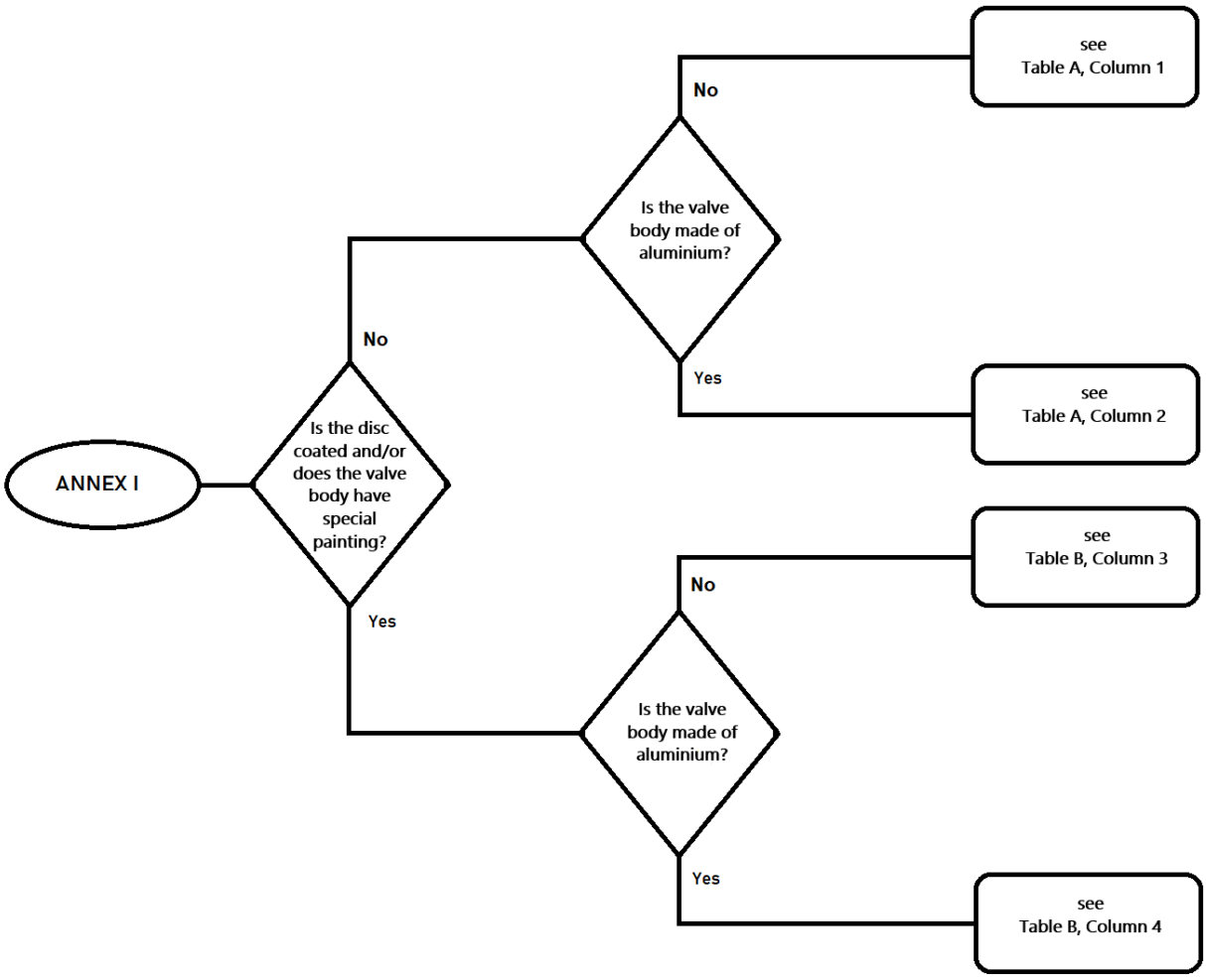


**Refer to the (red) key for valves DN ≥ 350.**



# ANNEX I

## Procedure for identifying the full ATEX marking, which is not provided on the valve for space reasons.




Once the column has been identified, just select the line that corresponds to the liner fitted in the valve to find the full indications with the possible suitability limits.
In very rare cases, generally due to the application of coats of paint after installation, **if the thickness were to be ≥ 2 mm it would be forbidden to use the valves in explosive atmospheres with the presence of gases of group IIC and IIB:**

**suitability for Group IIA gas only ↔ Ex II 2G Ex h IIA 85°C...**

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**Table A – Full marking – with standard painting and/or UNCOATED disc ←→ also suitable for Gr. IIC gases**

| LINER | T liner max | T - class | T Surf.max depending on fluid TSmax | MARKING | T - class | T Surf.max with aluminium body EN AC / EN AB 46400 | | MARKING with RESTRICTIONS for VALVES with ALUMINIUM BODY |
|---|---|---|---|---|---|---|---|---|
| | | | | COLUMN 1 | | | | COLUMN 2 |
| NR - NATURAL RUBBER | 80° | T6 | 80°C | II 2G Ex h IIC 80°C (T6) Gb<br>II 2D Ex h IIIC 80°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 80°C | | ←→ UNCHANGED |
| PU - POLYURETHANE® | 90° | T6 | 85°C | II 2G Ex h IIC 85°C…90°C (T5) Gb<br>II 2D Ex h IIIC 85°C…90°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 90°C | | T5 | 90°C | | |
| NBR - BUNA®<br>CO - CARBOXYLATE<br>CR - NEOPRENE® | 100° | T6 | 85°C | II 2G Ex h IIC 85°C…100°C (T5) Gb<br>II 2D Ex h IIIC 85°C…100°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| CSM - HYPALON® | 125° | T6 | 85°C | II 2G Ex h IIC 85°C…125°C (T4) Gb<br>II 2D Ex h IIIC 85°C…125°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 125°C | | T4 | 125°C | | |
| EPDM<br>White EPDM | 130° | T6 | 85°C | II 2G Ex h IIC 85°C…130°C (T4) Gb<br>II 2D Ex h IIIC 85°C…130°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 130°C | | T4 | 130°C | | |
| HT EPDM | 135° | T6 | 85°C | II 2G Ex h IIC 85°C…135°C (T4) Gb<br>II 2D Ex h IIIC 85°C…135°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 135°C | | T4 | 135°C | | |
| MVQ - SILOPREN®<br>PTFE - TEFLON® | 190° | T6 | 85°C | II 2G Ex h IIC 85°C…190°C (T3) Gb<br>II 2D Ex h IIIC 85°C…190°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | II 2G Ex h IIC 85°C…150°C (T3) Gb<br>II 2D Ex h IIIC 85°C…150°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 135°C | | T4 | 135°C | | |
| | | T3 | 190°C | | T3 | 150°C | | |
| FKM - VITON® | 200° | T6 | 85°C | II 2G Ex h IIC 85°C…200°C (T3) Gb<br>II 2D Ex h IIIC 85°C…200°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | II 2G Ex h IIC 85°C…150°C (T3) Gb<br>II 2D Ex h IIIC 85°C…150°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 135°C | | T4 | 135°C | | |
| | | T3 | 200°C | | T3 | 150°C | | |

| | |
|---|---|
| **PROHIBITION: DO NOT USE Ghibson butterfly valves in Zone 0 and Zone 20 classified explosive atmospheres, neither inside nor outside.** |  |
|  | **PROHIBITION: DO NOT USE Ghibson butterfly valves with:**<br>• **hybrid mixtures (hybrid mixtures are mixtures of air and flammable substances in different material states).**<br>• **chemically unstable gases (flammable gases capable of explosive reactions even without air or oxygen)** |

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**Table B – Full marking – with [0,2 ≤ th(mm) < 2] painting/coating ←→ suitable for Gr. IIB (and IIA) gases only**

| LINER | $T_{liner\ max}$ | T - class | T Surf.max depending on fluid $TS_{max}$ | MARKING with RESTRICTIONS | T - class | T Surf.max with aluminium body EN AC / EN AB 46400 | | MARKING with FURTHER RESTRICTIONS for VALVES with ALUMINIUM BODY |
|---|---|---|---|---|---|---|---|---|
| | | | | COLUMN 3 | | | | COLUMN 4 |
| NR - NATURAL RUBBER | 80° | T6 | 80°C | II 2G Ex h IIB 80°C (T6) Gb<br>II 2D Ex h IIIC 80°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 80°C | | ←→ UNCHANGED |
| PU - POLYURETHANE® | 90° | T6 | 85°C | II 2G Ex h IIB 85°C…90°C (T5) Gb<br>II 2D Ex h IIIC 85°C…90°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 90°C | | T5 | 90°C | | |
| NBR - BUNA®<br>CO - CARBOXYLATE<br>CR - NEOPRENE® | 100° | T6 | 85°C | II 2G Ex h IIB 85°C…100°C (T5) Gb<br>II 2D Ex h IIIC 85°C…100°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| CSM - HYPALON® | 125° | T6 | 85°C | II 2G Ex h IIB 85°C…125°C (T4) Gb<br>II 2D Ex h IIIC 85°C…125°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 125°C | | T4 | 125°C | | |
| EPDM<br>White EPDM | 130° | T6 | 85°C | II 2G Ex h IIB 85°C…130°C (T4) Gb<br>II 2D Ex h IIIC 85°C…130°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 130°C | | T4 | 130°C | | |
| HT EPDM | 135° | T6 | 85°C | II 2G Ex h IIB 85°C…135°C (T4) Gb<br>II 2D Ex h IIIC 85°C…135°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | ←→ UNCHANGED |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 135°C | | T4 | 135°C | | |
| MVQ - SILOPREN®<br>PTFE - TEFLON® | 190° | T6 | 85°C | II 2G Ex h IIB 85°C…190°C (T3) Gb<br>II 2D Ex h IIIC 85°C…190°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | II 2G Ex h IIB 85°C…150°C (T3) Gb<br>II 2D Ex h IIIC 85°C…150°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 135°C | | T4 | 135°C | | |
| | | T3 | 190°C | | T3 | 150°C | | |
| FKM - VITON® | 200° | T6 | 85°C | II 2G Ex h IIB 85°C…200°C (T3) Gb<br>II 2D Ex h IIIC 85°C…200°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C | T6 | 85°C | | II 2G Ex h IIB 85°C…150°C (T3) Gb<br>II 2D Ex h IIIC 85°C…150°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C |
| | | T5 | 100°C | | T5 | 100°C | | |
| | | T4 | 135°C | | T4 | 135°C | | |
| | | T3 | 200°C | | T3 | 150°C | | |

| | |
|---|---|
|  | **PROHIBITION:** In addition, the prohibitions mentioned previously, **DO NOT use** Ghibson butterfly valves with special painting (increased thickness) and/or a coated disc, being therefore:<br>II 2G Ex h IIB 85°C…<br>when the explosive atmosphere contains **Group IIC** gases (e.g. hydrogen, acetylene, carbon disulphide, etc.). |

**Rarely with th(mm) ≥ 2 painting ←→ suitable for Gr. IIA gases ONLY** II 2G Ex h IIA 85°C…

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**Example**

The standard valve plate, used previously, identifies a valve with a cast iron body, CF8M (stainless steel) disc and EPDM liner:


- BVPD series wafer type
- DN 450 size
- PN10-16/A150 flanges
- PS 10 bar (imposed by the BxPD series)
- $TS_{min}$ -10°C (imposed by the EN GJS400-15 cast iron body and therefore the fluid)
- $TS_{max}$ +130°C (imposed by the EPDM liner and therefore the fluid)

Moreover, since it is intended to operate in a classified zone, it also bears a second plate with simplified marking like the adjacent one, which refers to these additional ATEX safety instructions.


Assuming that it has been ordered, obviously for a suitable fluid that is compatible with the both liner and the temperature range, but with special C5M painting (thickness > 200µm and **therefore excluding group IIC gases**), refer to **Table B, Column 3**.

The "EPDM / White EPDM" line contains:

**Table B – Full marking –**

| LINER | T liner max | T - class | T surf max depending on fluid TSmax | |
|---|---|---|---|---|
| EPDM<br>EPDM White | 130° | T6 | 85°C | II 2G Ex h IIB 85°C…130°C (T4) Gb<br>II 2D Ex h IIIC 85°C…130°C Db<br>-50°C ≤ $T_{amb.}$ ≤ +80°C |
| | | T5 | 100°C | |
| | | T4 | 130°C | |

So, the full classification is:

**II 2G Ex h IIB 85°C…130°C (T4) Gb**
**II 2D Ex h IIIC 85°C…130°C Db**
**-50°C ≤ $T_{ambient}$ ≤ +80°C**

**note the indication as a range**

**Repeating once again, the surface temperature of the valve is due exclusively to the fluid (for example $T_{max}$ 75°C) and environmental conditions ($Ta_{max}$ 80°C).**
**<u>These conditions</u> result in a temperature class of T6, meaning the valve can also be used with a more demanding atmosphere.**

<table>
<tr>
<td>  </td>
<td>WARNING/HAZARD: as we already know, a hand-operated valve is NOT covered by the ATEX Directive.<br><br>Only valves combined with an actuator have to comply with the Directive.<br><br>As amply demonstrated, the valve plate data must be compared with the actuator plate data to assess the suitability of the assembly for the specific explosive atmosphere that may occur in the system. The “worst case” values must therefore also fulfil the parameters imposed by the zone classification.<br><br>The installer/end user is responsible for ensuring that the equipment used strictly complies with the system specifications and restrictions. <u>The installer/end user must check the assembly before it is put into service</u>.</td>
</tr>
<tr>
<td colspan="2">WARNING / HAZARD : the user will have to assess whether the fluid intercepted can cause electrostatic charge phenomena on the gasket of valve. As indicated in §38 of the ATEX Guidelines, these “polymeric parts could become charged, but this is no different from plastic pipes. Given that it is clear that the latter is outside of the scope of Directive 2014/34 / EU," that same applies to the gasket: this possible phenomenon is therefore only reported to the installer/ end user.</td>
<td>  </td>
</tr>
</table>