

QUICK ACTING & SELF-LOCKING LINE BLIND SPECIFICATION

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QUICK ACTING & SELF-LOCKING LINE BLIND SPECIFICATION

1. GENERAL

1.1 Scope

1.1.1. This specification covers the specific requirements for design, material, manufacturing, marking, inspection and testing of QUICK ACTING & SELF-LOCKING LINE BLINDS.

This application applies to QUICK ACTING & SELF-LOCKING LINE BLINDS from class 150lbs to 2500lbs and refer to the ASME B16.34.

1.1.2. In the event of any conflict between this specification and the related documents, the following order of precedence applies :

- 1) Purchase specification
- 2) QUICK ACTING & SELF-LOCKING LINE BLIND specification
- 3) Project Specifications
- 4) Owner's Standards
- 5) Codes and Standards
- 6) Manufacturer's Standards

1.2 Referenced documents

The following documents shall form an integral part of this specification to the extent specified herein.

Codes and Standards

Any codes and standards to be used shall be of the latest edition issued before April 1st 2014.

1) ASME Standards

| | |
|----------|---|
| B1.1 | Unified Inch. Screw Threads, UN and UNR Thread form |
| B1.20.1 | Pipe Threads, General Purpose, Inch |
| B16.5 | Pipe Flanges and Flanged fittings |
| B16.11 | Forged Steel Fittings, socket-welding |
| B16.20 | Metallic Gaskets for Pipes Flanges-Ring-joint, Spiral-Wound, and jacketed |
| B16.34 | Valves Flanged, Threaded and welding End |
| B18.2.1 | Square and Hex bolts and screw Inch series |
| B18.2.2 | Square and Hex Nuts |
| B31.3 | Process Piping |
| B36.10 M | Welded and Seamless Wrought Steel Pipe |
| B46.1 | Surface texture, Surface Roughness, Waviness and Lay |

2) ASTM Standards

3) API Standards

| | |
|-----|-------------------------------|
| 598 | Valves Inspection and Testing |
| 607 | Fire safe |

4) MSS Standards

| | |
|-------|--|
| SP-25 | Standard Marking system for Valves, Fittings, Flanges and Unions |
| SP-53 | Quality standard for Steel Castings and forgings for valves, Flanges and Fitting and Other Piping Components – Magnet Particle Exam Method |

QUICK ACTING & SELF-LOCKING LINE BLIND SPECIFICATION

1. GENERAL REQUIREMENT

1.1. General

A QUICK ACTING & SELF-LOCKING LINE BLIND is an irreversible quick-action mechanism that allows only one person to blind a pipe with ease and provides a repeatable sealing method with a guaranteed 100% positive isolation.

This system leads to eliminate the traditional laborious and unsafe ways of blinding, usually performed with extra personnel.

A blinding operation is required to ensure the positive isolation of following situations (examples) :

- process equipment (batch process, preventive maintenance, emergency maintenance)
- pipes (elimination of product mixtures)
- commissioning of new units (pressure testing, inspection, ...)

Without any tool or any heavy lift accessories and in a few minutes, any able-bodied person can operate a QUICK & SELF-LOCKING LINE BLIND : the result is a 100% positive isolation and a perfect tightness because the QUICK ACTING & SELF-LOCKING LINE BLIND is calibrated in factory and does not require any adjustment or modification on site.

2. DESIGN

2.1. General

The QUICK ACTING & SELF-LOCKING LINE BLIND shall conform to the specific design conditions mentioned in the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheet (Appendix1) if any or ASME B16.34A at least.

The QUICK ACTING & SELF-LOCKING LINE BLIND must be designed for 100% full bore without any dead chamber to avoid cavitation or erosion unless otherwise specified.

All the mechanical components, directly or indirectly subjected to a force resulting from the internal pressure, will be calculated in accordance with ASME Sect VIII div 1 or ANSI B31.3 (slide gate thickness) or ASME Sect II part D (other mechanical parts).

The QUICK ACTING & SELF-LOCKING LINE BLIND is constructed with 2 half-bodies and a slide gate fitted with seals on both sides: full bore and blinded positions.

Sealing is realized by the clamp of the seats onto the slide gate fitted with seals.

2.2. Body

2.2.1 The wall thickness of the body between body plate and flange shall be in accordance with the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheet (Appendix1) and ASME B36.10.

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2.2.2 End Flanges shall be forged in one piece with the half-body's seat. Half-bodies shall not be designed with a welded construction up to NPS 42" in order to avoid corrosion attacks in Heat Affected Zone (HAZ).

2.2.3 Connection ends of QUICK ACTING & SELF-LOCKING LINE BLIND shall follow ASME B16.5 or specific requisition per the end user's requirements.

2.2.4 The surface finish is completed in accordance with the international standards such as ASME B16.5, ASME 16.47, API 6A or owner's standards.

2.2.5 The threads of bolts shall be in accordance with manufacturer's standards.

However, due to stress corrosion of steels, the clamping system of the gate must not include threaded elements (H2S service).

2.3 Slide Gate

2.3.1 The design thickness of the slide gate (blinding plate) shall be determined in accordance with ASME B31.3.

2.3.2 Slide gate's thickness shall be in accordance with end user's standard drawings if any.

2.3.3 Otherwise, for the design wall thickness of the slide gate, ASME 16.48 or API590 shall be used as minimum standard.

2.4 Tightness / Sealing

2.4.2 Sealing between the two half-bodies and slide gate face will be achieved only with seals inserted into grooves machined into the slide gate.

2.4.3 The mechanical clamping system guarantees a perfect parallelism between seats and slide gate's faces with a metal to metal contact.

2.4.4 Designs with internal seals inside the body are prohibited for reliability and maintenance reasons.

2.4.5 All seals must be accessible for inspection and possible replacement in either of the two operating phases, full bore position or blind position.

2.4.6 All seals are accessible without shutdown and without removal of any parts of any internal mechanical elements. Replacement of seals on the slide gate shall be done without interrupting the process.

2.5 Operation

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- 2.5.2 The QUICK ACTING & SELF-LOCKING LINE BLIND must be able to be operated manually by only one person.
- 2.5.3 The QUICK ACTING & SELF-LOCKING LINE BLIND shall be operated without the use of any tool or lifting equipment.
- 2.5.4 Vertical movement slide gates are manufactured with an additional component enabling a one person operation of the QUICK ACTING & SELF-LOCKING LINE BLIND without risk of injury or damage to the QUICK ACTING & SELF-LOCKING LINE BLIND or the seals.
- 2.5.5 The QUICK ACTING & SELF-LOCKING LINE BLIND can be automated if required in the QUICK ACTING & SELF-LOCKING LINE BLIND data sheet (Appendix1).
- 2.5.6 Depending on the size, internal diameter (ID) and design conditions, a lever or a manual gear actuator with handwheel be specified; in any case, such tools are to be provided by the manufacturer as an integrated component of the QUICK ACTING & SELF-LOCKING LINE BLIND.
- 2.5.7 The force required to operate the device (either lever or handwheel) shall not exceed 20Kg.
- 2.5.8 When the seats are unclamped, the integrity of the seals must be preserved by design. The centering of the sliding gate between the two seats must be guaranteed mechanically in order to avoid any damage to the seals or the QUICK ACTING & SELF-LOCKING LINE BLIND, on both sides of the slide gate during the whole operation.
- 2.5.9 For seals in good working order and integrity, the tightness must be generated by the function and guaranteed by design of the QUICK ACTING & SELF-LOCKING LINE BLIND. Tightening of the seals must be achieved independently of the force applied by the operator of the QUICK ACTING & SELF-LOCKING LINE BLIND. The operator shall not be responsible for assessing or creating the tightness of the seals of the QUICK ACTING & SELF-LOCKING LINE BLIND
- 2.5.10 During operation, sealing of the QUICK ACTING & SELF-LOCKING LINE BLIND is reached by full cycle of motion. Adjusting and testing is accomplished in manufacturer's workshop prior to shipment and delivery of the QUICK ACTING & SELF-LOCKING LINE BLIND to the installation location.
- 2.5.11 The QUICK ACTING & SELF-LOCKING LINE BLIND is calibrated in manufacturer's workshop and does not require any adjustment or modification on site.
- 2.5.12 The clamped seats position must be guaranteed by a self-locking mechanical system design.
- 2.5.13 By design, the clamping of the sliding gate is irreversible to avoid any releasing/unclamping of the seats in case of vibration or resulting force from the media's pressure (hammer blow effect).
The mechanical parts which realize this irreversible function are calculated following the ASME Standards (ANSI B31.3 or ASME Sect II part D).

Note: "Irreversible mechanical clamping system" cannot be considered for :

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- mechanical bonds based on helical screws or sliding bonds achieved by inclined planes (surface) with an angle greater than 5 ° (reversible angle) relative to the perpendicular to the displacement axis
- mechanical clamping systems using worm screw (or clamp screw) because this method is considered insufficient to guaranteed an irreversible kinematic chain due to eventual corrosion of these mechanical components

2.6. Time of operation

Data below are for information only; they are based on average values observed at several customers subject to several environmental conditions

2.6.1. Class 150

- NPS 1" to 10" : less than 1 minute.
- NPS 12" up to 24" : 3 minutes approx.
- NPS 24" up to 36" : 10 minutes approx.
- Above 36" : manufacturer's standard

2.6.2. Class 300 and above or design temperature > 250°C

- NPS 1" to 6" : less than 1 minute
- NPS 6" to 12" : less than 3 minute
- NPS 12" up to 30" : 10 minutes approx.
- Above 30" : manufacturer's standard

2.7 Safety

- 2.7.1 All QUICK ACTING & SELF-LOCKING LINE BLINDS can be locked with a padlock or key device in order to avoid any wrong operation.

3. MATERIALS

3.1. Pressure Containing Parts

- 3.1.1 Material specifications shall be strictly in accordance with the standards referred to this specification and QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheets (Appendix1).
- 3.1.2 Up to 42" class 150, half bodies will be forged only.

3.2. Seals

The seals are only on the slide gate.

The seals are outside of the process: it must be possible to check their integrity before operating the QUICK ACTING & SELF-LOCKING LINE BLIND.

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3.2.1. The seals on slide gate shall be exactly equivalent in quality and performance to those specified in the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheets (Appendix1) if any or to manufacturer's standard if none.

3.2.2. The seals must be reusable in function of the design conditions set forth in the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheet (Appendix1).

3.2.3. Seals used must be in accordance with and of the same material referenced into the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheet (Appendix1).

3.2.4. Graphite seals must be used for fire safe design.

3.3. Gear boxes

3.3.1. Any and all mechanism with sprockets must have sprockets constructed of ductile cast iron with an hardness value of 400-650 HV.

3.3.2. In case of a fire safe design, bronze is not acceptable for sprocket (gear) material.

4. **RELIABILITY / MAINTENANCE ISSUES**

4.1. Reliability

The design must be a reliable design and no shutdown of the process is acceptable in order to check internal components or devices (no internal seals are permitted in order to avoid a long maintenance shutdown time).

4.2. Environment

The design choices will favor reliable mechanical systems and simple design to avoid environmental problems (dust, corrosive environment etc.): the QUICK ACTING & SELF-LOCKING LINE BLIND design will utilize a minimum number of parts in movement, and will contain only self-lubricated bushing/bearings, etc.

4.3. Spare parts and preventive maintenance

The number of parts which could be replaced during the life of the QUICK ACTING & SELF-LOCKING LINE BLIND must be limited.

4.3.1. Seals shall be reusable after first compression and sealing guaranteed in case of emergency.

4.3.2. The QUICK ACTING & SELF-LOCKING LINE BLIND must be equipped with grease fittings in order to be integrated in Preventive maintenance. This information has to be considered in the User's manual.

4.4. Use of expansion joint

The use of an expansion joint must be limited as much as possible and must not be permanently in contact with the media / products flowing into the pipe. As these elements are deformed by mechanical stress by design, these expansion joints must be replaceable when the QUICK ACTING &

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SELF-LOCKING LINE BLIND is in service. Their replacement should not require that the line is shut down or that the QUICK ACTING & SELF-LOCKING LINE BLIND is removed from the line.

5. INSPECTION AND TESTING

5.1 General

For each QUICK ACTING & SELF-LOCKING LINE BLIND, the manufacturer must perform the following tests prior to shipment:

- Hydraulic shell test,
- Hydraulic tightness test,
- Pneumatic tightness test.

The following international standards and minimum values are to be met:

| | Standard | Test Pressure | Fluid |
|------------|---------------------------|-----------------------------------|----------------|
| Shell Test | API598 | 1.5 X Design pressure at 25 deg C | As per API 598 |
| Leak Test | ASME B31.3 ASME B16.34 | 1.1 X design pressure | Water |

5.2 Hydraulic shell test

The test pressure is set to 1,5 x PS (design pressure) at ambient temperature.

The QUICK ACTING & SELF-LOCKING LINE BLIND should be in the hollow/full bore position.

The test duration time and the test acceptance criteria are expressed in the table 1.

5.3 Hydraulic tightness test

The test pressure is set to 1,1 x PS (design pressure).

The QUICK ACTING & SELF-LOCKING LINE BLIND should be tested in three positions:

- Hollow/full bore position.
- Blinded position on the first side.
- Blinded position on the second side.

The test duration time and the test acceptance criteria are expressed in the table 1.

5.4 Pneumatic tightness test

The test pressure is set to the lower pressure between 6 bar and 1.5 x PS (design pressure) at ambient temperature.

The QUICK ACTING & SELF-LOCKING LINE BLIND should be tested in three positions:

- Hollow position.
- Blinded position on the first side.
- Blinded position on the second side.

The test duration time and the test acceptance criteria are expressed in the table 1.

5.5 Testing pressure, test duration time and acceptance criteria

Table 1

| Test type | fluid | Pressure | Duration | | Acceptance criteria |
|----------------------|--------|---|-----------|---------|---|
| | | | DN (mm) | T (min) | |
| Hydraulic shell test | Liquid | 1,5 x maximal allowable pressure at ambient temperature | ≤ 100 | 2 | No permanent deformation No visually detectable leak on the external side of the shell |
| | | | 100 à 250 | 5 | |
| | | | 300 à 450 | 15 | |
| | | | ≥ 500 | 30 | |
| | | | ≤ 100 | 2 | |

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| | | | | | |
|--------------------------|--------|---|-----------|----|-------------------------|
| Hydraulic tightness test | Liquid | 1,1 x maximal allowable pressure | 100 à 250 | 5 | No leak during the test |
| | | | 300 à 450 | 15 | |
| | | | ≥ 500 | 30 | |
| Pneumatic tightness test | Gas | Minimum between 6 bar and 1.5 x PS (design temperature) at ambient temperature. | All | 3 | |

5.6 Optional inspection points

Each QUICK ACTING & SELF-LOCKING LINE BLIND has to be inspected in accordance with additional requirements contained in the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheet as for example:

- Mill certificates for pressure containing parts,
- Visual inspection,
- Functional test,
- Dimensional measurement,
- Pressure test,
- Non-destructive examination for body and slide gate,
- Hardness test, as per Owner's rules if applicable.

5.7 Non-destructive Examination (NDE)

5.7.1 Non-destructive Examination (NDE) requirements, which depend on material and line pressure rating, shall refer to the requirements in the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheet. (% , type...)

5.7.2 NDE for body and bonnet shall be carried out to the provisions of ASME B16.34.

5.8 Positive Material Identification Examination

Positive material identification (PMI) will be carried out in accordance with project requirements. Any supplied components which are found to be of incorrect material or improperly identified will be rejected.

5.9 Test and Inspection Report

After final inspection, the test and inspection report have to be submitted for each QUICK ACTING & SELF-LOCKING LINE BLIND.

6 PAINTING

6.1 Owner's standard

Exterior finish of the QUICK ACTING & SELF-LOCKING LINE BLIND per the owner's standards and specifications.

6.2 Pre-painted hidden areas

To prevent corrosion of hidden mechanical elements, these parts of the QUICK ACTING & SELF-LOCKING LINE BLIND can be painted before assembly and test. Out of specific requirement, the owner's acceptance will be considered as received. Only parts that would be hidden after assembly are concerned.

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7 MARKING

7.1 Required Markings

Required marking items are listed below

| MARKING | NAME PLATE |
|-------------------------------------|------------|
| Manufacturer's Name or Trade Name | X |
| Rating Designation | X |
| Nominal Pipe Size | X |
| Material Designation for body | X |
| Material Designation for slide gate | X |

6.2 Nameplate Markings

- The nameplate material shall be stainless steel with a minimum thickness of 1.0 mm.
- The nameplate shall be securely attached to the body.
- The nameplate may not be attached to any pressure containing parts of any line blind by welding, brazing, riveting, screwing, or any other method that would reduce the line blind wall thickness.

7. QUICK ACTING AND SELF-LOCKING LINE BLIND SPECIFICATION DATA SHEET

All QUICK ACTING & SELF-LOCKING LINE BLIND shall be designed, manufactured, inspected and tested in accordance with the requirements listed in the QUICK ACTING & SELF-LOCKING LINE BLIND specification data sheets. Refer to the attached specification.

QUICK ACTING & SELF-LOCKING LINE BLIND SPECIFICATION

ANNEX 1

QUICK ACTING & SELF-LOCKING LINE BLIND SPECIFICATION DATA SHEET

| TECHNICAL SPECIFICATION | | | | | | |
|-------------------------|------|------------------------------------|---|---------------------------|----------------|---------|
| | | CUSTOMER: | | | Date | |
| | | PROJECT: | | | Written by | |
| | | LOCATION: | | | Checked by | |
| | | CONTACT: | | | Approved by | |
| | | CUSTOMER SPECIFICATION: | | | | |
| GENERAL | 1 | CUSTOMER TAG | | | | |
| | 2 | ONIS MODEL | | | | |
| | 3 | ONIS CODE | | | | |
| | 4 | QUANTITY | | | | |
| CONNEXION-ASSEMBLING | 5 | NOMINAL SIZE | inch | | | |
| | 6 | END CONNECTION | Flanges | Welding End | | |
| | 7 | FLANGE RATING | NA | | | |
| | 8 | FLANGE SURFACE | NA | | | |
| | 9 | RUGOSITY (Ra) | NA | | | |
| | 10 | MAWP (PS) | | | | |
| | 11 | MAWT (TS) | from °F (°C) to °F (°C) | | | |
| | 12 | BODY THICKNESS / INTERNAL DIAMETER | / | | | |
| | 13 | FACE TO FACE / WEIGHT | mm / Kg | | | |
| | 14 | PIPE POSITION | HORIZONTAL / VERTICAL | | | |
| | 15 | SLIDE GATE MOVEMENT | HORIZONTAL / VERTICAL (with lifting device) | | | |
| | 16 | PAINTING SYSTEM | ONIS STANDARD / CUSTOMER SPECIFICATION | | | |
| PROCESS CONDITIONS | 17 | APPLICATION | Normal Mode | | Cleaning Phase | |
| | 18 | MEDIUM | | | | |
| | 19 | PHYSICAL STATE | Liquide / Gas | | Liquide / Gas | |
| | 20 | DENSITY | | | | |
| | 21 | VISCOSITY | | | | |
| | 22 | % H2S | | | | |
| | 23 | OPERATING PRESSURE (max) | bar | psi | bar | psi |
| | 24 | OPERATING TEMPERATURE (min / max) | °C / °C | °F / °F | °C / °C | °F / °F |
| | 25 | DESIGN PRESSURE (max) | bar | psi | bar | psi |
| | 26 | DESIGN TEMPERATURE (min / max) | °C / °C | °F / °F | °C / °C | °F / °F |
| TECHNICAL CONSTRUCTION | | | ASTM or ASME | | ISO | |
| | 27.1 | BODY | | | | |
| | 27.2 | OVERLAY | NO / YES | If YES, details : | | |
| | 27.3 | COROSION ALLOWANCE | NO / YES | If YES, value : | | |
| | 28 | SLIDE GATE | | | | |
| | 29 | ORING SEAL | | | | |
| | 30 | OTHER PARTS | | | | |
| | 31 | DESIGN CODE | ASME B31.3 - ASME VIII div1 | | | |
| | 32 | OTHER CODE | | | | |
| | 33 | FIRE SAFE DESIGN | NO / YES (API 607) | | | |
| PRESSURE TEST | 34 | HYDRAULIC SHELL TEST | bar | psi | | |
| | 35 | HYDRAULIC LEAKNESS TEST | bar | psi | | |
| | 36 | PNEUMATIC LEAKNESS TEST | bar | psi | | |
| | 37 | SPECIFIC | bar | psi | | |
| SPRED / UN-SPREAD IMVT | 38 | MANUAL OPERATION | NO / YES | if YES: LEVER or GEAR BOX | | |
| | 39 | ELECTRICAL ACTUATOR | NO / YES | if YES, details : | | |
| | 40 | HYDRAULIC ACTUATOR | NO / YES | if YES, details : | | |
| | 41 | PNEUMATIC ACTUATOR | NO / YES | if YES, details : | | |
| SLIDE GATE IMVT | 42 | MANUAL | NO / YES | | | |
| | 43 | ELECTRICAL ACTUATOR | NO / YES | if YES, details : | | |
| | 44 | HYDRAULIC ACTUATOR | NO / YES | if YES, details : | | |
| | 45 | PNEUMATIC ACTUATOR | NO / YES | if YES, details : | | |
| OPTION | 46 | SAFETY LOCK | NO / YES | if YES, details : | | |
| | 47 | LIMIT SWITCHES: | NO / YES | if YES, details : | | |
| | 48 | DRAIN PORTS: | NO / YES | if YES, details : | | |
| COMMENTS | | | | | | |

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ANNEX 2

OVERALL DIMENSIONS

