



# Certificate / Certificat Zertifikat / 合格証

NAF 070721 C001

*exida* hereby confirms that the:

## NAF - Duball DL Ball Valves

DN 25 – DN 400 (1" – 16")

PN 10 – PN 40 (ANSI Class 150 & 300)

## Flowserve - NAF AB

SE-581 87 Linköping, Sweden

Have been assessed per the relevant requirements of:

**IEC 61508 : 2010 Parts 1-7**

and meets requirements providing a level of integrity to:

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A, Route 2<sub>H</sub> Device**

**PFH/PFD<sub>avg</sub> and Architecture Constraints  
must be verified for each application**

### Safety Function:

The Ball Valve will move to the designed safe position per the actuator design within the specified safety time.

### Application Restrictions:

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.

The manufacturer  
may use the mark:

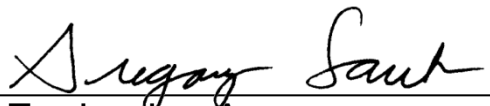


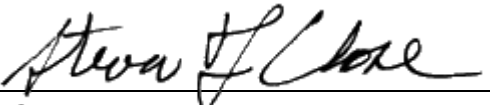
Revision 2.2 June 12, 2018  
Surveillance Audit Due  
June 1, 2021



ANSI Accredited Program  
ISO/IEC 17065  
PRODUCT CERTIFICATION BODY  
#1004



  
Evaluating Assessor

  
Certifying Assessor

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**Systematic Capability: SC 3 (SIL 3 Capable)****Random Capability: Type A, Route 2<sub>H</sub> Device****PFH/PFD<sub>avg</sub> and Architecture Constraints  
must be verified for each application****Duball DL Series  
Ball Valves****Systematic Capability:**

The products have met manufacturer design process requirements of Safety Integrity Level (SIL) 3. These are intended to achieve sufficient integrity against systematic errors of design by the manufacturer.

A Safety Instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

**Random Capability:**

The SIL limit imposed by the Architectural Constraints must be met for each element. This device meets *exida* criteria for Route 2<sub>H</sub>.

**IEC 61508 Failure Rates in FIT<sup>1</sup>**

Application	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$
Full Stroke, Clean Service	0	0	0	425
Tight Shut-Off, Clean Service	0	0	0	1052
Open on Trip, Clean Service	0	114	0	311
Full Stroke with PVST <sup>2</sup> , Clean Service	0	0	148	277
Tight Shut-Off with PVST, Clean Service	0	0	148	904
Open on Trip with PVST, Clean Service	114	0	148	163
Full Stroke, Severe Service	0	0	0	768
Tight Shut-Off, Severe Service	0	0	0	1964
Open on Trip, Severe Service	0	224	0	545
Full Stroke with PVST, Severe Service	0	0	257	511
Tight Shut-Off with PVST, Severe Service	0	0	257	1707
Open on Trip with PVST, Severe Service	224	0	257	288

<sup>1</sup> FIT = 1 failure / 10<sup>9</sup> hours

<sup>2</sup> PVST = Partial Valve Stroke Test

**SIL Verification:**

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/PFD<sub>avg</sub> considering redundant architectures, proof test interval, proof test effectiveness, any automatic diagnostics, average repair time and the specific failure rates of all products included in the SIF. Each element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

**Assessment Report:** NAF 07/07-21 R005 V4 R1 (or later)

**Safety Manual:** NFENDS4167



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