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Italia

CERTIFICATE

according to IEC EN 61508

Certificate No.: TUV IT 23 SIL 0191

CERTIFICATE OWNER: **Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.**
No.988, Yuexiu Road,
Fenhu Economic Development Zone,
PC: 215200, Suzhou City,
Jiangsu Province,
P. R. China

WE HEREWITH CONFIRM THAT

AB SERIES FLB LINED FLUORINE BALL VALVES

MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLE

FOR THE SAFETY FUNCTIONS:

SIF1: "correct switching on demand (open to closed) and tight for closing phase, in low demand mode of operation"

SIF2: "correct switching on demand (closed to open), in low demand mode of operation"

Examination result:	**The above reported AB Series FLB Lined Fluorine Ball Valves were found to meet the standard defined requirements of the safety levels detailed in the following table according to IEC EN 61508, under fulfillment of the conditions listed in the Report R TUV IT 23 SIL 0180, on which this Certificate is based**
Examination parameters:	**Construction/Functional characteristics and reliability and availability parameters of the above mentioned AB Series FLB Lined Fluorine Ball Valves**
Official Report No.:	**R TUV IT 22 SIL 0180**
Expiry Date	**March, 22th 2026**
Reference Standard	**IEC EN 61508:2010 Part 2, 4, 6, 7**

Milan, March, 23rd 2023

TÜV ITALIA Srl

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TÜV SÜD
Italia

TÜV ITALIA Srl
Industrie Service Division
Managing Director

Alberto Carelli

SUMMARY TABLE

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E/EE/EP safety-related system (final element)	**AB Series FLB Lined Fluorine Ball Valves produced by Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.**	
System type	Type A	
Systematic Capability	*SC3*	
Safety Function Definition	*SIF1: "Correct switching on demand (open to closed) and tight for closing phase, in low demand mode of operation"*	*SIF2: "Correct switching on demand (closed to open), in low demand mode of operation"*
Max SIL(1)	**SIL3**	**SIL3**
λ_{TOT}	5,667E-08	5,667E-08
λ_{NE}	1,356E-08	1,939E-08
λ_{S}	0,000E+00	0,000E+00
$\lambda_{DD,PST}$(2)	1,150E-08	2,744E-08
$\lambda_{DU,FPT}$	3,161E-08	9,844E-09
β and β_D factor	10%	10%
MRT	8 h	8 h
Hardware Safety Integrity	Route 2_H	Route 2_H
Systematic Safety Integrity	Route 2_S	Route 2_S

Remarks

(1) The Safety Integrity Level (SIL) of the entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD_{AVG} considering the 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 subsystem must be checked to assure compliance with the minimum hardware fault tolerance (HFT) requirements.

(2) Considering an automatic Partial Stroke Test.

SIL classification according to Standard IEC EN 61508:2010 for AB Series FLB Lined Fluorine Ball Valves produced by Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.

NOTE: The present table is integral part of the Document TUV IT 23 SIL 0191
Date: March, 23rd 2023