

CERTIFICATE

according to IEC EN 61508

Certificate No.: TUV IT 24 SIL 0347

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CERTIFICATE OWNER:

Chaoda Valves Group Co., Ltd. *Registered Address:* Jiangbei Street, Oubei, Yongjia, PC: 325105, Zhejiang Province, P. R. China *Manufacturing Address:* Wuxing Industry Zone, Oubei, Yongjia, PC: 325105, Zhejiang Province, P. R. China

WE HEREWITH CONFIRM THAT CD SERIES FLOATING 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 CD Series Floating 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 24 SIL 0320, on which this Certificate is based

Construction/Functional characteristics and reliability and availability parameters of the above mentioned CD Series Floating Ball Valves

Official Report No.:

Examination parameters:

R TUV IT 24 SIL 0320

Expiry Date

February, 22nd 2027

 THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-722233004-02

 Reference Standard
 IEC EN 61508:2010 Part 2, 4, 6, 7

ZERTIFIKAT

Milan, February, 23rd 2024

TÜV ITALIA Srl



TÜV ITALIA Srl Industrie Service Division Managing Director Alberto Carelli

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SUMMARY TABLE



Italia

E/EE/EP safety-related system (final element)	CD Series Floating Ball Valves produced by Chaoda Valves Group Co., Ltd.	
System type	Type A SC3	
Systematic Capability		
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
λτοτ	1,614E-09	1,614E-09
λ_{NE}	3,861E-10	5,521E-10
λ_{S}	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	3,274E-10	7,814E-10
λ _{DU,FPT}	9,002E-10	2,803E-10
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

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(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 CD Series Floating Ball Valves produced by Chaoda Valves Group Co., Ltd.

NOTE: The present table is integral part of the Document TUV IT 24 SIL 0347 Date: February, 23rd 2024

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