The manufacturer may use the mark:

Certificate / Certificat

Zertifikat / 合格証

VIR 080153 C001

exida hereby confirms that the:

Ball Valve Series

Virgo Europe SpA
Milan, Italy

Has been assessed per the relevant requirements of:

IEC 61508 Parts 1, 2

and meets requirements providing a level of integrity to:

Systematic Integrity: SIL 3 Capable

Random Integrity: Type A Device

PFD_{AVG} 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.

Reports:
VIR 08/01-53 R001 FMEDA Report V1 R1

VIR 08/01-53 R003 IEC 61508 Assessment Report V1 R2

Validity:
This assessment is valid for Ball Valves (includes Underground and Cryogenic): 2"-72" and pressure rating to ANSI 2500 or API 15000.

This assessment is valid until August 1, 2011.

Revision 1.0 July 11, 2008

exida Certification S.A.

Product Assessor

Auditor

Certificate / Certificat / Zertifikat / 合格証

VIR 080153 C001

Systematic Integrity: SIL 3 Capable

Random Integrity: Type A Device

PFD_{AVG} and Architecture Constraints must be verified for each application

Ball Valve Series

Virgo Europe SpA, Milan, Italy

SIL 3 Capability:

The product has 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 without "prior use" justification by end user or diverse technology redundancy in the design.

IEC 61508 Failure Rates

For valves used in a final element assembly, SIL must be verified for the specific application using the following failure rate data.

Failure rates for Ball Valves in FIT*

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0 FIT	942 FIT	0 FIT	711 FIT
Tight-Shutoff	0 FIT	503 FIT	0 FIT	1150 FIT
Open on Trip	0 FIT	1181 FIT	0 FIT	472 FIT
Full Stroke with PVST	0 FIT	942 FIT	265 FIT	446 FIT
Tight-Shutoff with PVST	0 FIT	503 FIT	265 FIT	885 FIT
Open on Trip with PVST	0 FIT	1181 FIT	265 FIT	207 FIT
Underground, Full Stroke	0 FIT	931 FIT	0 FIT	761 FIT
Underground, Tight-Shutoff	0 FIT	492 FIT	0 FIT	1200 FIT
Underground, Open on Trip	0 FIT	1152 FIT	0 FIT	540 FIT
Underground, Full Stroke with PVST	0 FIT	931 FIT	284 FIT	478 FIT
Underground, Tight-Shutoff with PVST	0 FIT	492 FIT	284 FIT	917 FIT
Underground, Open on Trip with PVST	0 FIT	1152 FIT	284 FIT	257 FIT
Cryogenic, Full Stroke	0 FIT	957 FIT	0 FIT	737 FIT
Cryogenic, Tight-Shutoff	0 FIT	528 FIT	0 FIT	1166 FIT
Cryogenic, Open on Trip	0 FIT	1178 FIT	0 FIT	516 FIT
Cryogenic, Full Stroke with PVST	0 FIT	957 FIT	253 FIT	484 FIT
Cryogenic, Tight-Shutoff with PVST	0 FIT	528 FIT	253 FIT	913 FIT
Cryogenic, Open on Trip with PVST	0 FIT	1178 FIT	253 FIT	263 FIT

SIL Verification:

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

* FIT = 1 failure / 10^9 hours

exida Certification S.A.

Form	Version	Date
C61508	2.02	July 2008