

# TECHNIS

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## CERTIFICATE of RELIABILITY and FUNCTIONAL SAFETY

This is to certify that

The **Integral Flo-Tel XD** provided by **ELFAB Ltd**, Alder Road, North Shields, Tyne & Wear **NE29 8SD**. has been assessed and is considered suitable for use in a low demand safety function:

- As an unvoted item (ie hardware fault tolerance of 0) at SIL 2

This claim is in respect of random hardware failures and architectural constraints (ie safe failure fraction) based on an FMEA utilising returns (warranty) data from 2004 to 2014 for the major component part. The assessment was based on the assumptions, proven-in-use data provided, and recommendations given in Technis Report T733 (Issue 1.0). The product was assessed against the failure modes:

- Failure to Indicate a Burst
- Spurious Indication of Bursting

Integrity in respect of failure to burst	SIL 2
Total Failure Rate	0.1945 pmh
"hazardous" failure rate (unrevealed)	0.0661 pmh
"safe" failure rate (revealed)	0.1282 pmh
System Type	A
Hardware Fault Tolerance	0
Safe Failure Fraction	>65%
PFD (hazardous failure)	$2.9 \times 10^{-3}$
Proof Test Interval	Up to 10 years

The assessment was carried out having regard to the guidance in IEC 61508 [2010] and the related body of guidance in respect of:

- Random Hardware Failures and Architectural Constraints [route 1<sub>H</sub>]

Signed:  (Certificate No T733-017) – 7 June 2014)

*Dr David J. Smith BSc, PhD, CEng, FIEE, FIQA, HonFSaRS, MIGasE*

*This certificate does not warrant fitness for any specific applications related purpose and is based on probabilistic and statistical assessment*