

ISO/TR 16194:2017-04 (E)

Pneumatic fluid power - Assessment of component reliability by accelerated life testing - General guidelines and procedures

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols and units	3
5	Concepts of reliability and accelerated life testing	3
6	Failure mechanism and mode	4
7	Strategy of conducting accelerated life testing	4
8	Design of accelerated life testing	5
8.1	Normal use conditions	5
8.2	Preliminary tests	5
8.3	Levels of accelerated stress	6
8.4	Sample size	7
8.5	Data observation and measurement	7
8.6	Types of stress loading	7
9	End of test	8
9.1	Minimum number of failures required	8
9.2	Termination cycle count	8
9.3	Suspended or censored test units	8
10	Statistical analysis	9
10.1	Analysis of failure data	9
10.2	Life distribution	9
10.3	Accelerated life testing model	10
10.4	Data analysis and parameter estimation	10
11	Reliability characteristics from the test data	11
12	Test report	12
Annex A (informative) Determining stress levels when stress is time-dependent		13
Annex B (informative) Life-stress relationship models		17
Annex C (informative) Verification of compromise Weibull slopes		26
Annex D (informative) Calculation procedures for censored data		32
Annex E (informative) Examples of using accelerated life testing in industrial applications		35

Annex F (informative) Palmgren-Miner's rule	37
Annex G (informative) ALT experimental results for pneumatic cylinder	39
Bibliography	59