

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