

DIN EN 15857:2010-05 (E)

Non-destructive testing - Acoustic emission - Testing of fibre-reinforced polymers - Specific methodology and general evaluation criteria

	Contents	Page
Foreword	3	
Introduction	4	
1 Scope	5	
2 Normative references	5	
3 Terms and definitions	6	
4 Personnel qualification	7	
5 AE sources and acoustic behaviour of FRP	7	
5.1 AE source mechanisms	7	
5.2 Wave propagation and attenuation characterisation	8	
5.3 Test temperature	8	
5.4 Source location procedures	8	
5.5 Analysis of AE from FRP	9	
6 Instrumentation and monitoring guidelines	10	
6.1 General	10	
6.2 Sensors	10	
6.3 Sensor location and spacing	10	
6.4 Sensor coupling and mounting	10	
6.5 Detection and evaluation threshold	11	
6.6 Application of load	11	
6.7 Graphs for real-time monitoring	11	
7 Specific methodology	12	
7.1 General	12	
7.2 Testing of specimens	13	
7.3 Testing of components and structures	13	
7.3.1 Preliminary information	13	
7.3.2 Test preparation	14	
7.3.3 Load profiles	14	
7.3.4 Written test instruction	16	
7.3.5 Evaluation criteria	17	
7.3.6 Stop criteria	20	
7.4 Health monitoring	20	
8 Interpretation of AE results / source mechanisms	20	
9 Documentation	21	
Annex A (informative) Recommended standard formats for presentation of AE data (examples)	22	
A.1 AE testing of specimens	22	
A.1.1 Example 1: AE data from static tensile testing of UD Carbon-fibre/Epoxy composite	22	
A.1.2 Example 2: AE data from mode I DCB delamination test of UD Glass-fibre/Epoxy composite	27	
A.2 AE testing of components and structures, example 3: AE data from pressure testing	34	

A.3	Advanced analysis methods	41
A.3.1	General	41
A.3.2	Waveform/wave mode analysis	41
A.3.3	Frequency spectrum (FFT) analysis	41
A.3.4	Pattern recognition of AE sources	41
A.3.5	Modelling of AE sources	42
	Bibliography	43