Test Matrix

Specimen	Interface	Stress ratio R	Aims	Journal paper
Sp_1	0//0	0.1	①	[1]
Sp_2	0//0	0.1	①	[1]
Sp_3	0//0	0.5	①	[1]
Sp_4	0//0	0.1	①	[1]
Sp_5	0//0	0.5	①	[1]
Sp_6	0//0	0.1	①	[1]
Sp_7	0//0	0.1	①③⑤	[1],[3],[4],[6]
Sp_8	0//0	0.1	①	[1]
Sp_9	0//0	0.1	①	[1]
Sp_10	0//0	0.5	③	[4],[7]
Sp_11	0//0	0.1	①③⑤	[1],[3],[4],[6]
Sp_12	0//0	0.5	②③	[2],[4],[7]
Sp_13	0//0	0.5	④	
Sp_14	0//0	0.5	④	
Sp_15	0//0	0.5	④	
Sp_16	0//0	0.5	④	[2]
Sp_17	0//0	0.5	④	[2]
Sp_18	0//0	0.5	④	
Sp_19	0//0	0.5	④	
Sp_20	0//0	0.5	④	
Sp_21	0//0	0.5	⑤	[3]
Sp_22	0//0	0.5	⑤	[3]
Sp_23	0//0	0.7	③	
Sp_24	0//0	0.7	⑤	
Sp_25	0//0	0.5	⑤	
Sp_26	0//0	0.2	⑤	
Sp_27	0//0	0.2	⑤	
Sp_28	0//0	0.7	③	
Sp_29	45//45	0.5	①	[1]
Sp_30	45//45	0.1	①⑤	[1],[3]
Sp_31	45//45	0.1	①	[1]
Sp_32	45//45	0.5	⑤	[3]
Sp_33	45//45	0.1	①③	[1]
Sp_34	45//45	0.5	①②③	[1],[2]
Sp_35	45//45	0.5	⑤	
Sp_36	45//45	0.5	①②	[1],[2]
Sp_37	45//45	0.5	③	
Sp_38	45//45	0.5	②	[2]
Sp_39	45//45	0.5	⑤	
Sp_40	45//45	0.7	⑤	
Sp_41	45//45	0.7	③	
Sp_42	45//45	0.2	⑤	[3]

Sp_43	45//45	0.23	⑤	[3]
Sp_44	45//45	0.2	⑤	
Sp_45	45//45	0.7	⑤	
Sp_46	45//45	0.5	①	[1]
Sp_47	+45//-45	0.5	③	
Sp_48	+45//-45	0.5	⑤	
Sp_49	+45//-45	0.5	⑤	
Sp_50	+45//-45	0.5	⑤	
Sp_51	+45//-45	0.5	⑤	
Sp_52	+45//-45	0.1	⑤	
Sp_53	+45//-45	0.1	③	
Sp_54	0//0	0.5	①③	[5],[7],[8]
Sp_55	0//0	0.5	①③	[5]
Sp_56	0//0	0.5	①③	[5]

Aims:

① Bridging effect study

② Damage state difference study in quasi-static and fatigue delamination

③ Difference amount of fibre bridging in fatigue delamination

④ Difference amount of fibre bridging in quasi-static delamination

⑤ Stress ratio effect on fatigue delamination

Journal paper:

[1] Liaojun Yao, René Alderliesten, Meiying Zhao, Rinze Benedictus. Bridging effect on mode I fatigue delamination behavior in composite laminates. Composites Part A: Applied Science and Manufacturing. 2014. 63: 103-109

[2] Liaojun Yao, René Alderliesten, Meiying Zhao, Rinze Benedictus. Discussion on the use of the strain energy release rate for fatigue delamination characterization. Composites Part A: Applied Science and Manufacturing. 2014. 66:65-72

[3] Liaojun Yao, René Alderliesten, Rinze Benedictus. Interpreting the stress ratio effect on delamination growth in composite laminates using the concept of fatigue fracture toughness. Composites Part A: Applied Science and Manufacturing. 2015. 78: 135-142

[4] Liaojun Yao, René Alderliesten, Rinze Benedictus. The effect of fibre bridging on the Paris relation for mode I fatigue delamination growth in composites. Composite Structures. 2016. 140: 125-135

[5] Liaojun Yao, Yi Sun, Liheng Guo, R.C. Alderliesten, R. Benedictus, Meiying Zhao, Liyong Jia. Fibre bridging effect on the Paris relation of mode I fatigue delamination in composite laminates with different thicknesses. International Journal of Fatigue 2017. 103: 196-206

[6] Liaojun Yao, Yi Sun, Liheng Guo, Meiying Zhao, R.C. Alderliesten, R. Benedictus. A modified Paris relation for fatigue delamination with fibre bridging in composite laminates. Composite Structures 2017. 176: 556-564

[7] Liaojun Yao, Yi Sun, Liheng Guo, Liyong Jia, Meiying Zhao. A validation of a modified Paris relation for fatigue delamination growth in unidirectional composite laminates. Composites Part B: Engineering 2018. 132: 97-106

[8] Liaojun Yao, J.A. Pascoe, R.C. Alderliesten. Experimental method to account for fibre bridging in mode I fatigue delamination growth data.