

## **Appendix F**

### **Geometry characterization of specimens**

The results of the geometry characterization of specimens are reported in the following tables. Collected measurements and mean values are reported specimen by specimen, grouped by laminate of origin.

**Table F.1:** Specimens from laminate LAM365

Batch:		1		Date: March 1st, 2013					
Laminate:	365	Specimen mean dimensions		Length [mm]	249.83	Width [mm]	20.03	Thickness [mm]	3.62
<b>Specimen 1</b>									
Position	1	Width [mm]	19.76	Thickness [mm]	3.71	Position	1	Width [mm]	20.08
	2		19.80		3.67		2		20.17
	3		19.85		3.68		3		20.09
Mean			19.80		3.69	Mean			20.12
Length [mm]			249.89			Length [mm]			249.81
<b>Specimen 2</b>									
Position	1	Width [mm]	20.04	Thickness [mm]	3.71	Position	1	Width [mm]	20.08
	2		20.04		3.71		2		20.09
	3		20.05		3.64		3		20.14
Mean			20.04		3.69	Mean			20.10
Length [mm]			249.87			Length [mm]			249.84
<b>Specimen 3</b>									
Position	1	Width [mm]	20.07	Thickness [mm]	3.65	Position	1	Width [mm]	20.13
	2		20.10		3.62		2		20.12
	3		20.08		3.56		3		20.16
Mean			20.08		3.61	Mean			20.14
Length [mm]			249.85			Length [mm]			249.84
<b>Specimen 4</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.64	Position	1	Width [mm]	20.11
	2		19.94		3.62		2		20.17
	3		19.91		3.49		3		20.09
Mean			19.92		3.58	Mean			20.12
Length [mm]			249.84			Length [mm]			249.81
<b>Specimen 5</b>									
Position	1	Width [mm]	20.12	Thickness [mm]	3.66	Position	1	Width [mm]	20.13
	2		20.09		3.64		2		20.12
	3		20.12		3.60		3		20.16
Mean			20.11		3.63	Mean			20.14
Length [mm]			249.86			Length [mm]			249.84
<b>Specimen 6</b>									
Position	1	Width [mm]	20.00	Thickness [mm]	3.63	Position	1	Width [mm]	20.06
	2		20.03		3.60		2		20.06
	3		20.04		3.54		3		20.11
Mean			20.02		3.59	Mean			20.05
Length [mm]			249.76			Length [mm]			249.78
<b>Specimen 7</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.64	Position	1	Width [mm]	20.00
	2		19.97		3.59		2		20.03
	3		19.99		3.58		3		20.00
Mean			19.99		3.61	Mean			20.00
Length [mm]			249.78			Length [mm]			249.78
<b>Specimen 8</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.64	Position	1	Width [mm]	20.00
	2		19.94		3.62		2		20.03
	3		19.91		3.49		3		20.04
Mean			19.92		3.58	Mean			20.02
Length [mm]			249.84			Length [mm]			249.76
<b>Specimen 9</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.63	Position	1	Width [mm]	20.00
	2		19.94		3.58		2		20.03
	3		19.93		3.49		3		20.04
Mean			19.92		3.57	Mean			20.02
Length [mm]			249.80			Length [mm]			249.76
<b>Specimen 10</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.63	Position	1	Width [mm]	20.00
	2		19.94		3.58		2		20.03
	3		19.93		3.49		3		20.04
Mean			19.92		3.57	Mean			20.02
Length [mm]			249.80			Length [mm]			249.76
<b>Specimen 11</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.63	Position	1	Width [mm]	20.00
	2		19.94		3.58		2		20.03
	3		19.93		3.49		3		20.04
Mean			19.92		3.57	Mean			20.02
Length [mm]			249.80			Length [mm]			249.76
<b>Specimen 12</b>									
Position	1	Width [mm]	19.90	Thickness [mm]	3.63	Position	1	Width [mm]	20.00
	2		19.94		3.58		2		20.03
	3		19.93		3.49		3		20.04
Mean			19.92		3.57	Mean			20.02
Length [mm]			249.80			Length [mm]			249.76



**Table F.2:** Specimens from laminate LAM366

Batch:		1		Date: March 1st, 2013			
Laminate:		366		Specimen mean dimensions			
<b>Specimen 1</b>		<b>Specimen 2</b>		<b>Specimen 3</b>		<b>Specimen 4</b>	
Position	Width [mm]	Position	Width [mm]	Position	Width [mm]	Position	Width [mm]
1	19,79	1	20,04	1	20,10	1	20,13
2	19,85	2	20,03	2	20,06	2	20,08
3	19,92	3	20,05	3	20,08	3	20,09
Mean	19,85	Mean	20,04	Mean	20,08	Mean	20,10
Length [mm]	250,03	Length [mm]	249,92	Length [mm]	249,83	Length [mm]	249,91
<b>Specimen 5</b>		<b>Specimen 6</b>		<b>Specimen 7</b>		<b>Specimen 8</b>	
Position	Width [mm]	Position	Width [mm]	Position	Width [mm]	Position	Width [mm]
1	20,05	1	20,14	1	20,20	1	20,10
2	20,00	2	20,17	2	20,14	2	20,07
3	20,00	3	20,08	3	20,20	3	19,83
Mean	20,02	Mean	20,13	Mean	20,180	Mean	20,00
Length [mm]	249,88	Length [mm]	249,86	Length [mm]	249,88	Length [mm]	249,87
<b>Specimen 9</b>		<b>Specimen 10</b>		<b>Specimen 11</b>		<b>Specimen 12</b>	
Position	Width [mm]	Position	Width [mm]	Position	Width [mm]	Position	Width [mm]
1	20,05	1	19,98	1	19,96	1	19,94
2	20,07	2	19,97	2	19,98	2	20,04
3	20,06	3	19,97	3	20,09	3	20,06
Mean	20,06	Mean	19,97	Mean	20,01	Mean	20,01
Length [mm]	249,86	Length [mm]	249,83	Length [mm]	249,84	Length [mm]	250,13
		Thickness [mm]		Thickness [mm]		Thickness [mm]	
		3,61		3,58		3,59	
		3,65		3,60		3,63	
		3,74		3,69		3,69	
		3,667		3,63		3,63	
		3,54		3,55		3,53	
		3,60		3,61		3,59	
		3,69		3,67		3,65	
		3,61		3,61		3,590	
		3,61		3,60		3,61	
		3,61		3,61		3,63	
		3,70		3,69		3,70	
		3,63		3,63		3,65	

**Table F.3:** Specimens from laminate LAM370

Batch:		2		Date: May 20th, 2013				
Laminate:	370	Specimen mean dimensions	Length [mm]	250.09	Width [mm]	20.07	Thickness [mm]	3.60
<b>Specimen 1</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.10	3.63	1	20.06	3.65	1	20.14	3.69
2	20.08	3.67	2	20.08	3.61	2	20.11	3.59
3	20.09	3.71	3	20.05	3.59	3	20.10	3.57
Mean	20.09	3.67	Mean	20.06	3.62	Mean	20.12	3.62
Length [mm]	250.28		Length [mm]	250.19		Length [mm]	250.34	
<b>Specimen 5</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.12	3.62	1	20.09	3.58	1	20.09	3.54
2	20.07	3.60	2	20.06	3.61	2	20.05	3.61
3	20.06	3.56	3	20.08	3.58	3	20.02	3.51
Mean	20.08	3.59	Mean	20.08	3.59	Mean	20.05	3.55
Length [mm]	250.21		Length [mm]	250.05		Length [mm]	250.03	
<b>Specimen 9</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.01	3.67	1	20.05	3.68	1	20.16	3.67
2	20.00	3.57	2	19.98	3.61	2	20.12	3.60
3	20.00	3.54	3	19.94	3.58	3	20.15	3.58
Mean	20.00	3.59	Mean	19.99	3.62	Mean	20.14	3.62
Length [mm]	250.00		Length [mm]	249.98		Length [mm]	249.92	
<b>Specimen 10</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.05	3.68	1	20.16	3.67	1	20.03	3.63
2	19.98	3.61	2	20.12	3.60	2	20.03	3.59
3	19.94	3.58	3	20.14	3.58	3	20.13	3.57
Mean	19.99	3.62	Mean	20.14	3.62	Mean	20.05	3.60
Length [mm]	249.98		Length [mm]	249.92		Length [mm]	249.95	
<b>Specimen 11</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.05	3.68	1	20.16	3.67	1	20.03	3.63
2	19.98	3.61	2	20.12	3.60	2	20.03	3.59
3	19.94	3.58	3	20.14	3.58	3	20.13	3.57
Mean	19.99	3.62	Mean	20.14	3.62	Mean	20.05	3.60
Length [mm]	249.98		Length [mm]	249.92		Length [mm]	249.95	
<b>Specimen 12</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.05	3.68	1	20.16	3.67	1	20.03	3.63
2	19.98	3.61	2	20.12	3.60	2	20.03	3.59
3	19.94	3.58	3	20.14	3.58	3	20.13	3.57
Mean	19.99	3.62	Mean	20.14	3.62	Mean	20.05	3.60
Length [mm]	249.98		Length [mm]	249.92		Length [mm]	249.95	
<b>Specimen 8</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.07	3.61	1	20.07	3.61	1	20.07	3.61
2	20.04	3.56	2	20.04	3.56	2	20.04	3.56
3	20.04	3.50	3	20.04	3.50	3	20.04	3.50
Mean	20.05	3.56	Mean	20.05	3.56	Mean	20.05	3.56
Length [mm]	250.14		Length [mm]	250.14		Length [mm]	250.14	
<b>Specimen 4</b>								
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20.16	3.64	1	20.16	3.64	1	20.16	3.64
2	20.10	3.60	2	20.10	3.60	2	20.10	3.60
3	20.10	3.59	3	20.10	3.59	3	20.10	3.59
Mean	20.12	3.61	Mean	20.12	3.61	Mean	20.12	3.61
Length [mm]	250.14		Length [mm]	250.14		Length [mm]	250.14	

**Table F.4:** Specimens from laminate LAM371

Batch:		2		Date: May 20th, 2013	
Laminate:		371		Specimen mean dimensions	
Position	1	Width [mm]	20.03	Thickness [mm]	3.65
	2		20.01		3.66
	3		20.08		3.68
Mean			20.04		3.66
Length [mm]			250.27		
Position	1	Width [mm]	20.06	Thickness [mm]	3.55
	2		20.04		3.58
	3		20.06		3.58
Mean			20.05		3.57
Length [mm]			250.14		
Position	1	Width [mm]	20.14	Thickness [mm]	3.59
	2		20.09		3.61
	3		20.13		3.63
Mean			20.12		3.61
Length [mm]			250.15		
Position	1	Width [mm]	20.03	Thickness [mm]	3.63
	2		20.02		3.62
	3		20.08		3.65
Mean			20.03		3.63
Length [mm]			250.25		
Position	1	Width [mm]	20.04	Thickness [mm]	3.54
	2		19.98		3.58
	3		20.00		3.53
Mean			20.01		3.55
Length [mm]			250.09		
Position	1	Width [mm]	20.04	Thickness [mm]	3.51
	2		20.05		3.56
	3		20.09		3.48
Mean			20.08		3.52
Length [mm]			250.05		
Position	1	Width [mm]	20.06	Thickness [mm]	3.60
	2		20.09		3.62
	3		20.08		3.62
Mean			20.08		3.61
Length [mm]			250.18		
Position	1	Width [mm]	20.06	Thickness [mm]	3.63
	2		20.09		3.62
	3		20.08		3.65
Mean			20.08		3.63
Length [mm]			250.18		
Position	1	Width [mm]	20.04	Thickness [mm]	3.51
	2		20.05		3.56
	3		20.09		3.48
Mean			20.08		3.52
Length [mm]			250.05		
Position	1	Width [mm]	20.04	Thickness [mm]	3.54
	2		19.98		3.58
	3		20.00		3.53
Mean			20.01		3.55
Length [mm]			250.09		
Position	1	Width [mm]	20.04	Thickness [mm]	3.51
	2		20.05		3.56
	3		20.09		3.48
Mean			20.08		3.52
Length [mm]			250.05		
Position	1	Width [mm]	20.03	Thickness [mm]	3.63
	2		20.02		3.62
	3		20.08		3.65
Mean			20.03		3.63
Length [mm]			249.99		
Position	1	Width [mm]	20.04	Thickness [mm]	3.51
	2		20.05		3.56
	3		20.09		3.48
Mean			20.08		3.52
Length [mm]			250.09		

**Table F.5:** Specimens from laminate LAM372

Batch:		2		Date: May 20th, 2013			
Laminate:	372	Specimen mean dimensions					
		Length [mm]	249.98	Width [mm]	19.99	Thickness [mm]	3.56
<b>Specimen 1</b>	Position						
	Width [mm]	19.82	19.85	19.93	19.99	20.04	20.04
	Thickness [mm]	3.53	3.52	3.53	3.51	3.55	3.50
	Length [mm]	19.85	19.81	19.99	20.04	20.08	20.03
Mean		19.85	19.82	19.99	19.99	20.05	20.05
		3.59	3.57	3.56	3.56	3.55	3.60
		250.15	250.08	250.07	250.07	250.07	250.07
<b>Specimen 5</b>	Position						
	Width [mm]	19.96	20.07	20.05	20.05	20.05	20.05
	Thickness [mm]	3.49	3.48	3.55	3.50	3.55	3.49
	Length [mm]	19.97	20.05	20.12	20.07	19.95	19.95
Mean		20.05	20.04	20.12	20.07	19.87	19.96
		3.61	3.56	3.60	3.55	3.59	3.54
		19.99	20.05	20.07	20.07	19.96	19.96
<b>Specimen 9</b>	Position						
	Width [mm]	20.06	19.98	20.04	20.04	20.09	20.10
	Thickness [mm]	3.52	3.53	3.55	3.52	3.62	3.59
	Length [mm]	20.11	20.04	20.09	20.04	20.12	20.10
Mean		20.10	20.04	20.09	20.04	20.10	20.10
		3.56	3.55	3.62	3.57	3.59	3.56
		249.86	249.91	249.92	249.97	249.97	249.86
<b>Specimen 10</b>	Position						
	Width [mm]	19.98	20.05	20.12	20.07	20.07	20.05
	Thickness [mm]	3.53	3.50	3.55	3.50	3.55	3.50
	Length [mm]	20.04	20.05	20.12	20.07	19.95	19.95
Mean		20.04	20.05	20.12	20.07	19.96	19.96
		3.57	3.53	3.60	3.55	3.54	3.54
		249.81	249.91	249.92	249.97	249.97	249.81

**Table F.6:** Specimens from laminate LAM373

<b>Batch:</b>		2		<b>Date:</b>		May 20th, 2013			
<b>Laminate:</b>				<b>Specimen mean dimensions</b>					
		373		250,13		20,07		3,55	
<b>Specimen 1</b>				<b>Specimen 2</b>				<b>Specimen 3</b>	
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20,08	3,52	1	20,09	3,49	1	20,11	3,49	1
2	20,09	3,53	2	20,07	3,51	2	20,07	3,53	2
3	20,07	3,61	3	20,13	3,58	3	20,10	3,57	3
Mean	20,08	3,55	Mean	20,10	3,53	Mean	20,09	3,53	Mean
Length [mm]	250,25		Length [mm]	250,25		Length [mm]	250,25		Length [mm]
<b>Specimen 5</b>				<b>Specimen 6</b>				<b>Specimen 7</b>	
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20,11	3,51	1	20,08	3,51	1	20,11	3,49	1
2	20,08	3,54	2	20,09	3,55	2	20,03	3,52	2
3	20,05	3,58	3	20,06	3,58	3	20,05	3,53	3
Mean	20,08	3,54	Mean	20,08	3,55	Mean	20,06	3,51	Mean
Length [mm]	250,12		Length [mm]	250,13		Length [mm]	250,13		Length [mm]
<b>Specimen 9</b>				<b>Specimen 10</b>				<b>Specimen 11</b>	
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20,03	3,54	1	20,10	3,55	1	20,07	3,57	1
2	20,03	3,58	2	19,99	3,58	2	20,08	3,61	2
3	20,00	3,58	3	19,93	3,59	3	20,12	3,64	3
Mean	20,02	3,57	Mean	20,01	3,57	Mean	20,09	3,61	Mean
Length [mm]	250,09		Length [mm]	250,02		Length [mm]	250,03		Length [mm]
								<b>Specimen 12</b>	
								Width [mm]	
								20,10	
								Thickness [mm]	
								250,20	
								Width [mm]	
								20,13	
								Thickness [mm]	
								3,51	
								Width [mm]	
								20,10	
								Thickness [mm]	
								3,54	
								Width [mm]	
								20,08	
								Thickness [mm]	
								3,55	
								Width [mm]	
								20,10	
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								3,53	
								Width [mm]	
								20,10	
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								20,10	
								Thickness [mm]	
								3,53	
								Width [mm]	
								20,10	
								Thickness [mm]	
								3,53	
								Width [mm]	
								20,10	
								Thickness [mm]	
								3,53	
								Width [mm]	
								20,10	

**Table F.7: Specimens from laminate LAM374**

Batch:		3		Date: May 20th, 2013							
Laminate:	374	Specimen mean dimensions		Length [mm]	249.994	Width [mm]	20.029	Thickness [mm]	7.156		
<b>Specimen 1</b>	Position	1	19.81	Thickness [mm]	7.08	<b>Specimen 2</b>	Position	1	19.92	Thickness [mm]	7.10
		2	19.88		7.11			2	19.91		7.13
		3	19.91		7.19			3	19.91		7.22
	Mean		19.87		7.13		Mean		19.91		7.15
Length [mm]		250.12		Length [mm]		250.06		Length [mm]		250.05	
<b>Specimen 5</b>	Position	1	20.02	Thickness [mm]	7.06	<b>Specimen 6</b>	Position	1	20.06	Thickness [mm]	7.05
		2	20.05		7.12			2	20.06		7.12
		3	20.08		7.16			3	20.05		7.15
	Mean		20.05		7.11		Mean		20.06		7.11
Length [mm]		249.96		Length [mm]		250.11		Length [mm]		250.13	
<b>Specimen 9</b>	Position	1	20.10	Thickness [mm]	7.12	<b>Specimen 10</b>	Position	1	20.06	Thickness [mm]	7.16
		2	20.02		7.19			2	20.09		7.24
		3	20.05		7.28			3	20.09		7.28
	Mean		20.06		7.20		Mean		20.08		7.23
Length [mm]		249.78		Length [mm]		249.85		Length [mm]		249.85	
<b>Specimen 3</b>	Position	1	20.00	Thickness [mm]	7.05	<b>Specimen 7</b>	Position	1	20.10	Thickness [mm]	7.09
		2	20.02		7.12			2	20.11		7.16
		3	20.06		7.18			3	20.11		7.23
	Mean		20.03		7.12		Mean		20.11		7.16
Length [mm]		250.05		Length [mm]		250.05		Length [mm]		250.10	
<b>Specimen 4</b>	Position	1	20.10	Thickness [mm]	7.04	<b>Specimen 8</b>	Position	1	20.09	Thickness [mm]	7.09
		2	20.08		7.08			2	20.06		7.17
		3	20.07		7.16			3	20.08		7.24
	Mean		20.08		7.09		Mean		20.08		7.17
Length [mm]		249.92		Length [mm]		249.92		Length [mm]		249.92	
<b>Specimen 11</b>	Position	1	20.03	Thickness [mm]	7.18	<b>Specimen 11</b>	Position	1	20.00	Thickness [mm]	7.25
		2	20.00		7.34			2	19.99		7.34
		3	20.01		7.26			3	20.01		7.34
	Mean		20.01		7.26		Mean		20.01		7.26
Length [mm]		249.85		Length [mm]		249.85		Length [mm]		249.85	

**Table F.8:** Specimens from laminate LAM375

Batch:		4		Date: June 27th, 2013	
Laminate:		375		Specimen mean dimensions	
		Length [mm]		250,23	
		Width [mm]		20,30	
		Thickness [mm]		7,23	
<b>Specimen 1</b>					
Position	1	20,31	7,54		
	2	20,28	7,43		
	3	20,26	7,31		
Mean		20,28	7,43		
Length [mm]		250,24			
<b>Specimen 2</b>					
Position	1	20,30	7,28		
	2	20,24	7,25		
	3	20,25	7,20		
Mean		20,26	7,24		
Length [mm]		250,12			
<b>Specimen 3</b>					
Position	1	20,36	7,28		
	2	20,31	7,18		
	3	20,31	7,17		
Mean		20,33	7,21		
Length [mm]		250,02			
<b>Specimen 4</b>					
Position	1	20,30	7,28		
	2	20,29	7,18		
	3	20,32	7,08		
Mean		20,32	7,18		
Length [mm]		250,00			
<b>Specimen 5</b>					
Position	1	20,36	7,27		
	2	20,29	7,18		
	3	20,32	7,08		
Mean		20,32	7,18		
Length [mm]		250,00			
<b>Specimen 6</b>					
Position	1	20,25	7,25		
	2	20,27	7,17		
	3	20,26	7,01		
Mean		20,26	7,14		
Length [mm]		250,02			
<b>Specimen 7</b>					
Position	1	20,17	7,28		
	2	20,25	7,18		
	3	20,35	7,07		
Mean		20,26	7,18		
Length [mm]		250,97			
<b>Specimen 8</b>					
Position	1	20,40	7,31		
	2	20,29	7,20		
	3	20,26	7,20		
Mean		20,32	7,24		
Length [mm]		250,96			
<b>Specimen 9</b>					
Position	1	20,40	7,28		
	2	20,33	7,20		
	3	20,33	7,19		
Mean		20,35	7,22		
Length [mm]		250,06			
<b>Specimen 10</b>					
Position	1	20,40	7,31		
	2	20,37	7,22		
	3	20,41	7,18		
Mean		20,38	7,25		
Length [mm]		250,05			
<b>Specimen 11</b>					
Position	1	20,36	7,34		
	2	20,37	7,22		
	3	20,41	7,18		
Mean		20,38	7,25		
Length [mm]		250,06			

**Table F.9:** Specimens from laminate LAM376

Batch:		5		Date: June 27th, 2013					
Laminate:	376	Specimen mean dimensions		Length [mm]	249.74	Width [mm]	20.32	Thickness [mm]	3.67
<b>Specimen 1</b>									
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.05	3.79	1	20.33	3.78	1	20.33	3.79	1
2	20.13	3.70	2	20.29	3.69	2	20.35	3.67	2
3	20.22	3.65	3	20.28	3.63	3	20.29	3.62	3
Mean	20.13	3.71	Mean	20.30	3.70	Mean	20.32	3.69	Mean
Length [mm]	248.92	Length [mm]	249.09	Length [mm]	249.23	Length [mm]	249.34	Length [mm]	249.34
<b>Specimen 5</b>									
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.23	3.73	1	20.25	3.74	1	20.28	3.71	1
2	20.17	3.67	2	20.29	3.66	2	20.24	3.65	2
3	20.17	3.58	3	20.35	3.54	3	20.30	3.45	3
Mean	20.19	3.66	Mean	20.30	3.65	Mean	20.27	3.60	Mean
Length [mm]	249.46	Length [mm]	249.71	Length [mm]	249.83	Length [mm]	249.92	Length [mm]	249.92
<b>Specimen 9</b>									
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.28	3.72	1	20.34	3.79	1	20.37	3.78	1
2	20.25	3.65	2	20.37	3.64	2	20.32	3.65	2
3	20.27	3.59	3	20.38	3.59	3	20.30	3.61	3
Mean	20.27	3.65	Mean	20.36	3.67	Mean	20.33	3.68	Mean
Length [mm]	250.13	Length [mm]	250.26	Length [mm]	250.42	Length [mm]	250.52	Length [mm]	250.52
<b>Specimen 10</b>									
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.28	3.72	1	20.34	3.79	1	20.37	3.78	1
2	20.25	3.65	2	20.37	3.64	2	20.32	3.65	2
3	20.27	3.59	3	20.38	3.59	3	20.30	3.61	3
Mean	20.27	3.65	Mean	20.36	3.67	Mean	20.33	3.68	Mean
Length [mm]	250.13	Length [mm]	250.26	Length [mm]	250.42	Length [mm]	250.52	Length [mm]	250.52
<b>Specimen 11</b>									
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.28	3.72	1	20.34	3.79	1	20.37	3.78	1
2	20.25	3.65	2	20.37	3.64	2	20.32	3.65	2
3	20.27	3.59	3	20.38	3.59	3	20.30	3.61	3
Mean	20.27	3.65	Mean	20.36	3.67	Mean	20.33	3.68	Mean
Length [mm]	250.13	Length [mm]	250.26	Length [mm]	250.42	Length [mm]	250.52	Length [mm]	250.52
<b>Specimen 12</b>									
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.28	3.72	1	20.34	3.79	1	20.37	3.78	1
2	20.25	3.65	2	20.37	3.64	2	20.32	3.65	2
3	20.27	3.59	3	20.38	3.59	3	20.30	3.61	3
Mean	20.27	3.65	Mean	20.36	3.67	Mean	20.33	3.68	Mean
Length [mm]	250.13	Length [mm]	250.26	Length [mm]	250.42	Length [mm]	250.52	Length [mm]	250.52



**Table F.10:** Specimens from laminate LAM377

Batch:		5		Date: June 27th, 2013	
Laminate:		377		Specimen mean dimensions	
<b>Specimen 1</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,04	3,67	1	20,30	3,67
2	20,10	3,62	2	20,27	3,60
3	20,19	3,59	3	20,30	3,59
Mean	20,11	3,63	Mean	20,29	3,62
Length [mm]	248,33		Length [mm]	249,07	
<b>Specimen 5</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,20	3,65	1	20,25	3,64
2	20,10	3,61	2	20,22	3,60
3	20,19	3,54	3	20,33	3,43
Mean	20,16	3,60	Mean	20,27	3,56
Length [mm]	249,61		Length [mm]	249,80	
<b>Specimen 9</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,33	3,66	1	20,28	3,69
2	20,19	3,61	2	20,28	3,62
3	20,23	3,57	3	20,33	3,58
Mean	20,25	3,61	Mean	20,30	3,63
Length [mm]	250,18		Length [mm]	250,29	
<b>Specimen 2</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,30	3,67	1	20,30	3,65
2	20,27	3,60	2	20,32	3,62
3	20,30	3,59	3	20,28	3,60
Mean	20,29	3,63	Mean	20,30	3,62
Length [mm]	249,07		Length [mm]	249,20	
<b>Specimen 6</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,25	3,64	1	20,25	3,64
2	20,22	3,60	2	20,21	3,60
3	20,33	3,43	3	20,23	3,45
Mean	20,27	3,60	Mean	20,23	3,56
Length [mm]	249,80		Length [mm]	249,89	
<b>Specimen 10</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,28	3,66	1	20,19	3,69
2	20,19	3,61	2	20,26	3,63
3	20,23	3,57	3	20,30	3,60
Mean	20,25	3,61	Mean	20,25	3,64
Length [mm]	250,18		Length [mm]	250,41	
<b>Specimen 11</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,19	3,69	1	20,19	3,69
2	20,26	3,63	2	20,26	3,63
3	20,30	3,60	3	20,30	3,60
Mean	20,25	3,64	Mean	20,25	3,64
Length [mm]	250,41		Length [mm]	250,41	
<b>Specimen 12</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,12	3,71	1	20,12	3,71
2	20,13	3,64	2	20,13	3,64
3	20,14	3,62	3	20,14	3,62
Mean	20,13	3,66	Mean	20,13	3,66
Length [mm]	250,62		Length [mm]	250,62	
<b>Specimen 3</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,30	3,65	1	20,27	3,66
2	20,32	3,62	2	20,22	3,61
3	20,28	3,60	3	20,20	3,59
Mean	20,30	3,62	Mean	20,23	3,62
Length [mm]	249,43		Length [mm]	249,43	
<b>Specimen 4</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,27	3,66	1	20,27	3,66
2	20,22	3,61	2	20,22	3,61
3	20,20	3,59	3	20,20	3,59
Mean	20,23	3,62	Mean	20,23	3,62
Length [mm]	249,43		Length [mm]	249,43	
<b>Specimen 7</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	20,25	3,64	1	20,25	3,64
2	20,21	3,60	2	20,21	3,60
3	20,23	3,45	3	20,23	3,45
Mean	20,23	3,56	Mean	20,23	3,56
Length [mm]	249,89		Length [mm]	249,89	
<b>Specimen 8</b>					
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]
1	19,58	3,64	1	19,58	3,64
2	19,90	3,61	2	19,90	3,61
3	20,41	3,54	3	20,41	3,54
Mean	19,96	3,60	Mean	19,96	3,60
Length [mm]	250,05		Length [mm]	250,05	

**Table F.11:** Specimens from laminate LAM378

Batch:		5		Date: June 27th, 2013					
<b>Laminate:</b>		<b>378</b>		<b>Specimen mean dimensions</b>					
				Length [mm]	249.62	Width [mm]	20.17	Thickness [mm]	3.59
<b>Specimen 1</b>				<b>Specimen 2</b>				<b>Specimen 3</b>	
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	19.97	3.76	1	20.28	3.63	1	20.22	3.62	1
2	20.03	3.78	2	20.27	3.59	2	20.27	3.58	2
3	20.12	3.84	3	20.25	3.58	3	20.33	3.56	3
Mean	20.04	3.79	Mean	20.27	3.60	Mean	20.27	3.59	Mean
Length [mm]	248.79		Length [mm]	248.96		Length [mm]	249.12		Length [mm]
<b>Specimen 5</b>				<b>Specimen 6</b>				<b>Specimen 7</b>	
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.18	3.59	1	20.27	3.60	1	20.30	3.61	1
2	20.14	3.56	2	20.20	3.59	2	20.21	3.58	2
3	20.15	3.54	3	20.31	3.49	3	20.11	3.37	3
Mean	20.16	3.56	Mean	20.26	3.56	Mean	20.21	3.52	Mean
Length [mm]	249.37		Length [mm]	249.51		Length [mm]	249.70		Length [mm]
<b>Specimen 9</b>				<b>Specimen 10</b>				<b>Specimen 11</b>	
Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position	Width [mm]	Thickness [mm]	Position
1	20.14	3.60	1	20.28	3.61	1	20.32	3.63	1
2	20.16	3.57	2	20.24	3.57	2	20.27	3.55	2
3	20.14	3.57	3	20.29	3.54	3	20.29	3.53	3
Mean	20.15	3.58	Mean	20.27	3.57	Mean	20.29	3.57	Mean
Length [mm]	250.02		Length [mm]	250.13		Length [mm]	250.30		Length [mm]
								<b>Specimen 12</b>	
								Width [mm]	20.05
								Thickness [mm]	3.66
								Position	1
								Position	2
								Position	3
								Mean	20.01
								Mean	19.93
								Mean	20.00
								Mean	20.00
								Mean	3.60
								Mean	3.60

**Table F.12:** Specimens from laminate LAM379

Batch:		5		Date: June 27th, 2013	
Laminate:		379		Specimen mean dimensions	
<b>Specimen 1</b>		379		249,95	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,29	3,76	1	20,23	3,68
2	20,24	3,71	2	20,24	3,66
3	20,25	3,69	3	20,22	3,64
Mean	20,26	3,72	Mean	20,23	3,66
Length [mm]	250,08		Length [mm]	250,06	
<b>Specimen 2</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,92	
<b>Specimen 3</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,91	
<b>Specimen 4</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,91	
<b>Specimen 5</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,91	
<b>Specimen 6</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,91	
<b>Specimen 7</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,91	
<b>Specimen 8</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,30	3,66	1	20,13	3,64
2	20,26	3,51	2	20,22	3,59
3	20,21	3,50	3	20,28	3,51
Mean	20,26	3,56	Mean	20,25	3,59
Length [mm]	249,94		Length [mm]	249,91	
<b>Specimen 9</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,34	3,68	1	20,13	3,72
2	20,30	3,62	2	20,18	3,65
3	20,33	3,57	3	20,25	3,65
Mean	20,32	3,62	Mean	20,19	3,67
Length [mm]	249,92		Length [mm]	249,93	
<b>Specimen 10</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,34	3,68	1	20,13	3,72
2	20,30	3,62	2	20,18	3,65
3	20,33	3,57	3	20,25	3,65
Mean	20,32	3,62	Mean	20,19	3,67
Length [mm]	249,92		Length [mm]	249,93	
<b>Specimen 11</b>		249,95		20,24	
Position	Width [mm]	Thickness [mm]	Position	Length [mm]	Thickness [mm]
1	20,34	3,68	1	20,13	3,72
2	20,30	3,62	2	20,18	3,65
3	20,33	3,57	3	20,25	3,65
Mean	20,32	3,62	Mean	20,19	3,67
Length [mm]	249,92		Length [mm]	249,93	

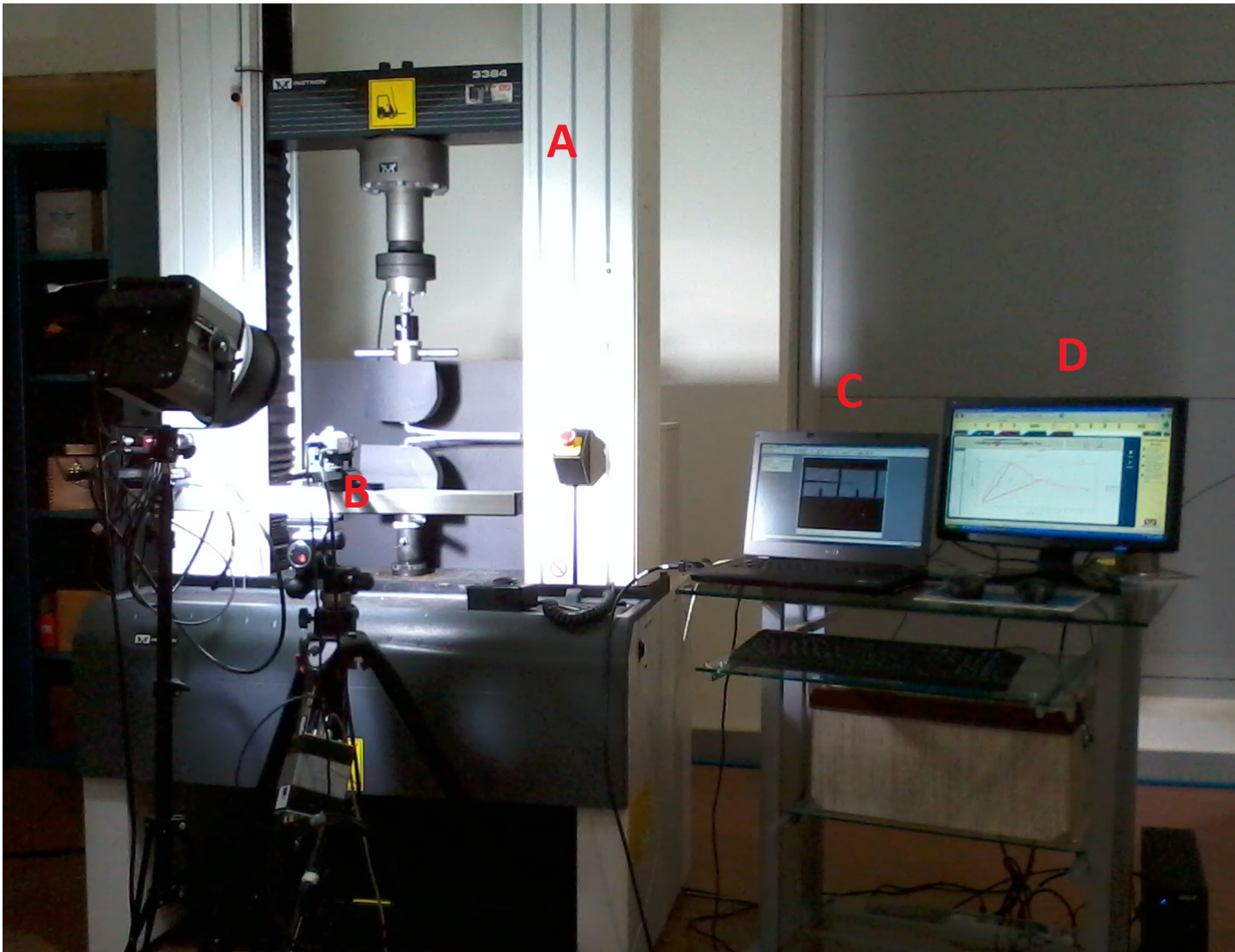


# Appendix G

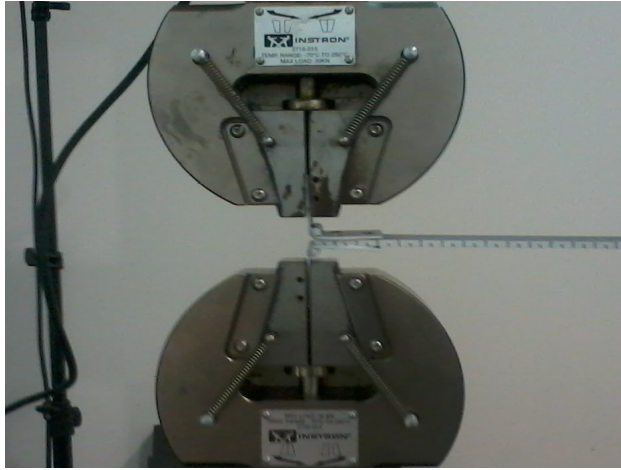
## Interlaminar Fracture Toughness (IFT) tests

### G.1 Experimental setup

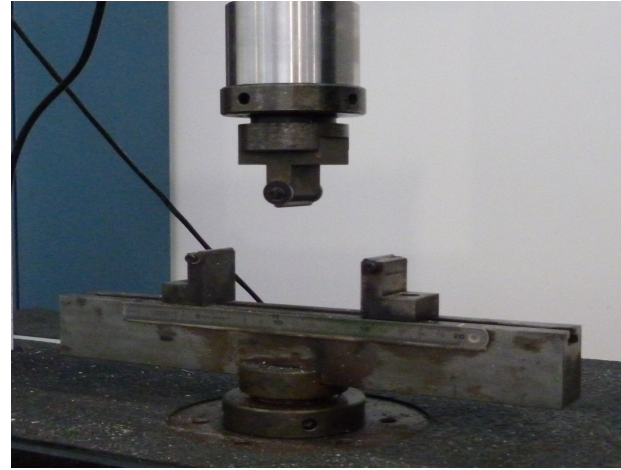
The experimental setup for Interlaminar Fracture Toughness (IFT) tests is shown in Figure G.1 on the next page; details of the different testing fixtures used are reported in Figure G.2 on page 233.



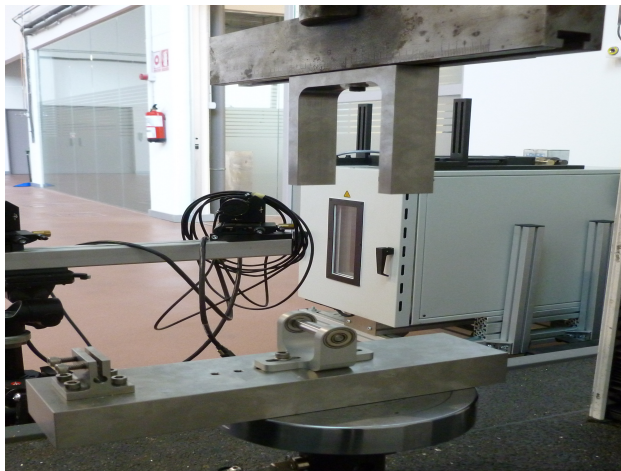
**Figure G.1:** Experimental setup for Interlaminar Fracture Toughness tests: A. Instron 3384 tensile machine; B. Vic-Snap camera for frame recording; C. Computer for recording control; D. Computer for mechanical testing control.



(a) Fixture for mode I testing.



(b) Fixture for mode II testing.



(c) Fixture for mixed mode I-II testing: fixed parts.



(d) Fixture for mixed mode I-II testing: mobile lever.

**Figure G.2:** Experimental fixtures for Interlaminar Fracture Toughness testing.

## G.2 Mode I

A complete list of the tests performed is reported in Table G.1 for UD specimens and in Table G.2 on page 237 for specimens with the  $0/90^\circ$  interface.

**Table G.1:** UD DCB specimens tested.

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM365-01	2	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-02	2	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-03	2	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-04	2	250	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-05	2	250	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-06	2	250	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-07	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-08	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-09	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.

*Table G.1: continues in the next page*



*Table G.1: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM365-10	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-11	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM365-12	2	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-01	2	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-02	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-03	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-04	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-05	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-06	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.
LAM366-07	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.
LAM366-08	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.

*Table G.1: continues in the next page*

*Table G.1: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM366-09	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.
LAM366-10	1	10-100	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-11	2	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM366-12	-	-	Upper hinge detached.
LAM377-12	50	50	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-01	50	50	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-02	250	250	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-03	250	250	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-04	500	500	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-05	500	500	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-06	500	500	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM379-07	250	250	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.

*Table G.1: ends from previous page.*

**Table G.2:** 0/90° interface DCB specimens tested.

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM374-01	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.
LAM374-02	-	-	Due to an inattention while positioning the specimen test fixture, the specimen was accidentally opened and made unavailable.
LAM374-03	1	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM374-04	1	250	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM374-05	1	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM374-06	-	500	Specimen loaded directly without generating a pre-crack in quasi-static conditions.
LAM374-07	-	250	Specimen loaded directly without generating a pre-crack in quasi-static conditions.
LAM374-08	-	50	Specimen loaded directly without generating a pre-crack in quasi-static conditions.
LAM374-09	-	1	Specimen loaded directly without generating a pre-crack in quasi-static conditions.
LAM374-10	-	500	Specimen loaded directly without generating a pre-crack in quasi-static conditions.
LAM374-11	250	250	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.

*Table G.2: continues in the next page*

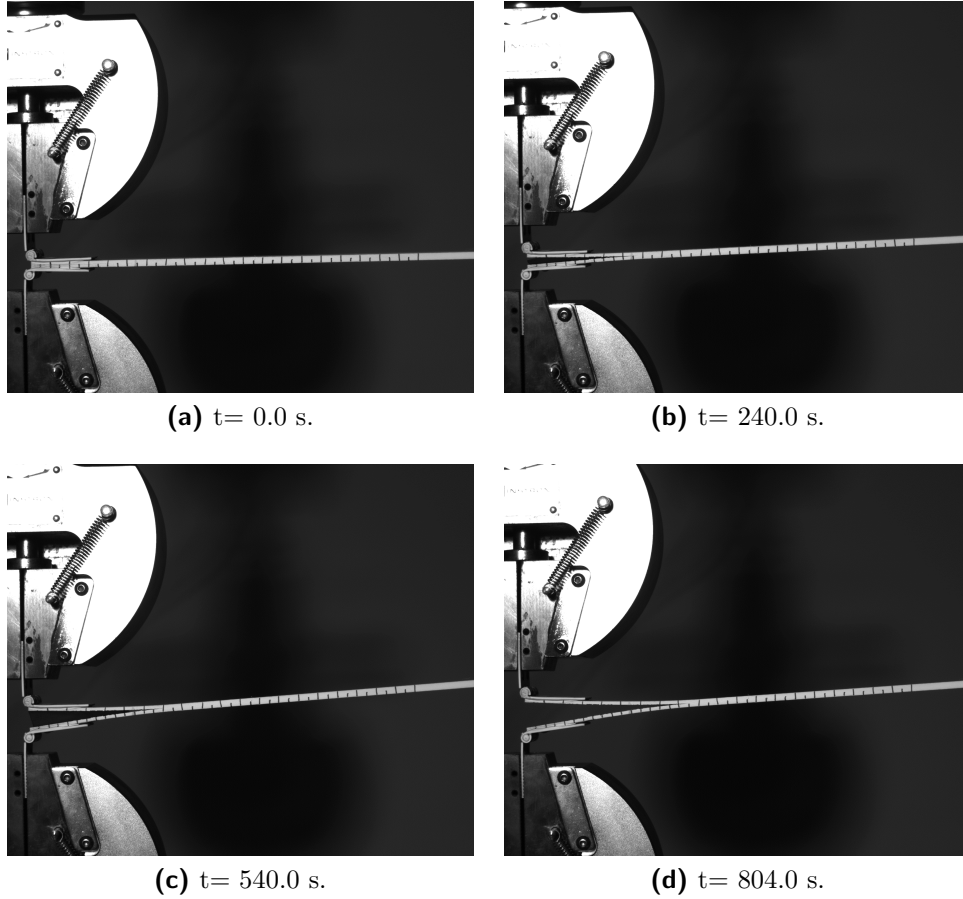
*Table G.2: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM375-01	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.
LAM375-02	50	50	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM375-03	250	250	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM375-04	500	500	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM375-05	1	1	Specimen loaded at quasi-static conditions, unloaded and reloaded at quasi-static conditions.
LAM375-06	1	50	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM375-07	1	250	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM375-08	1	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM375-09	50	50	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM375-10	250	250	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.
LAM375-11	500	500	Specimen loaded directly at high velocity, unloaded and reloaded at the same velocity.

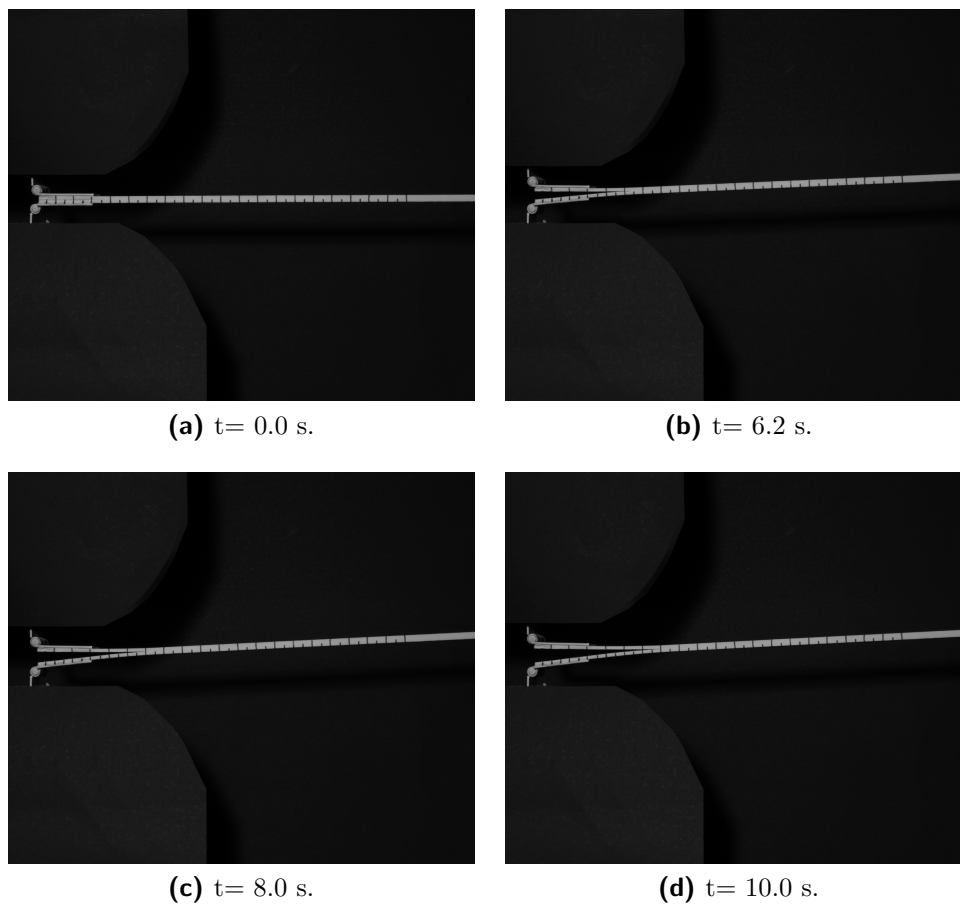
*Table G.2: ends from previous page.*

The following Figures report the evolution of delamination in UD DCB

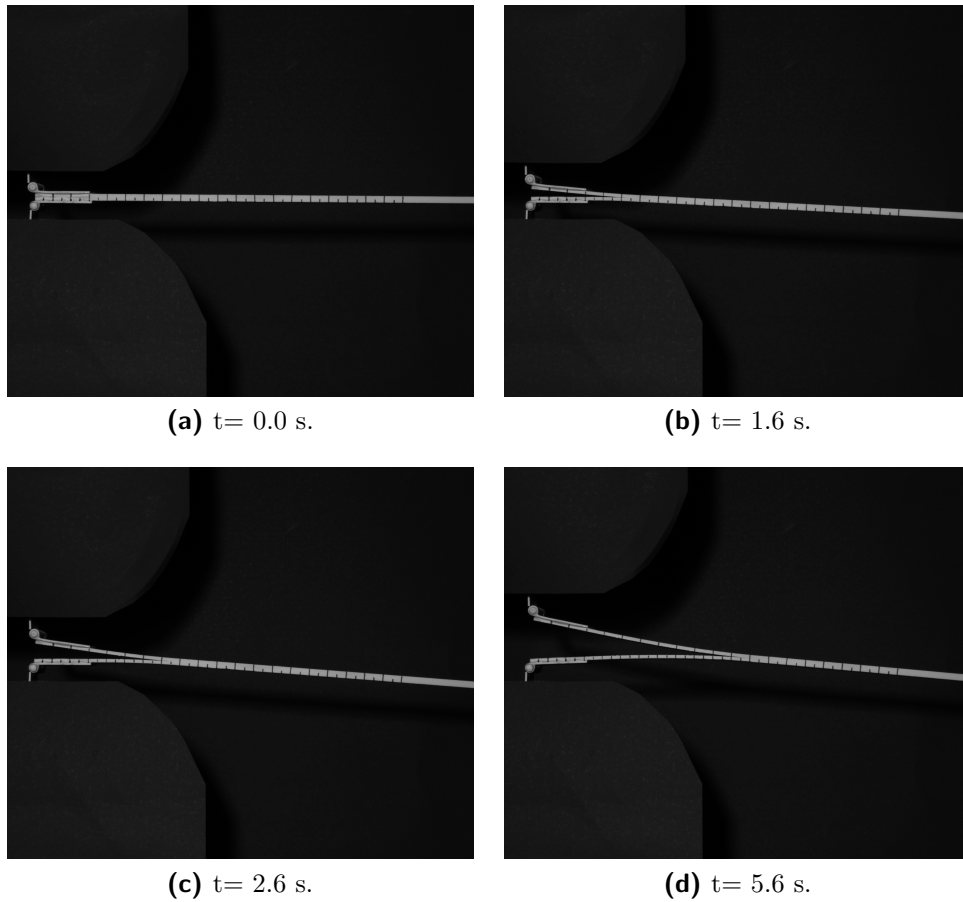
specimens for the different velocities tested.



**Figure G.3:** Mode I delamination propagation in UD interface loaded at 1 mm/min (specimen LAM366-07).

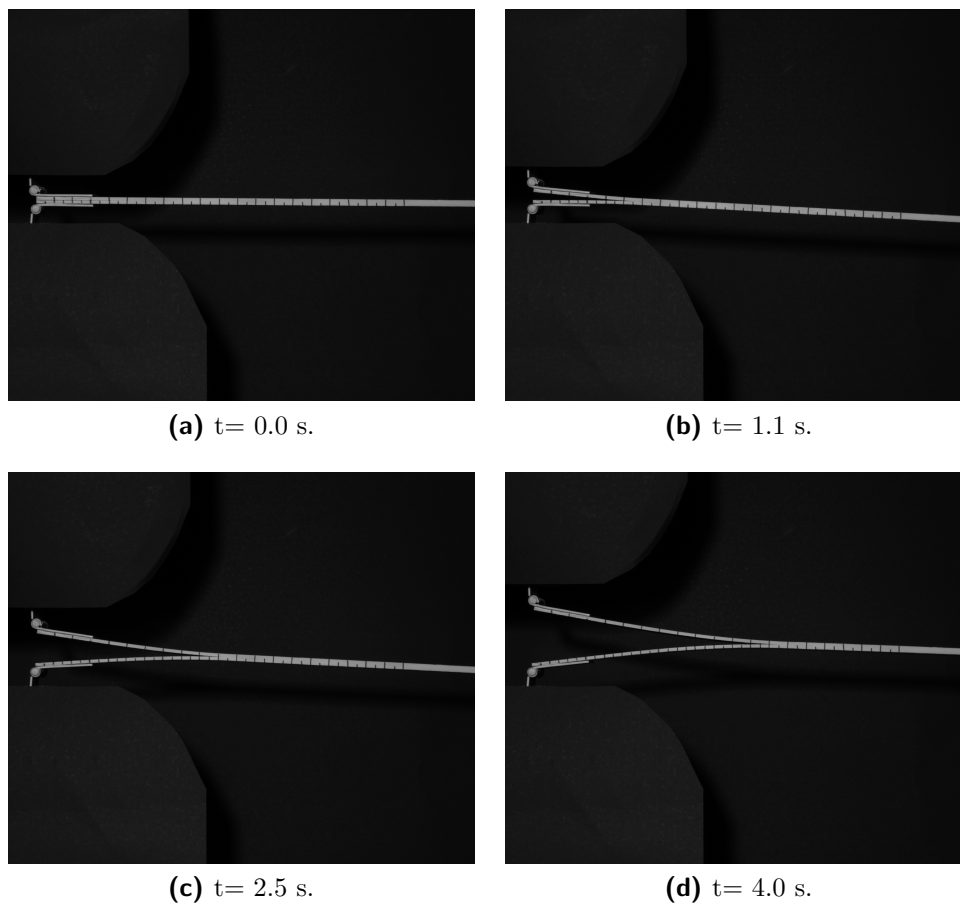


**Figure G.4:** Mode I delamination propagation in UD interface loaded at 50 mm/min (specimen LAM379-01).



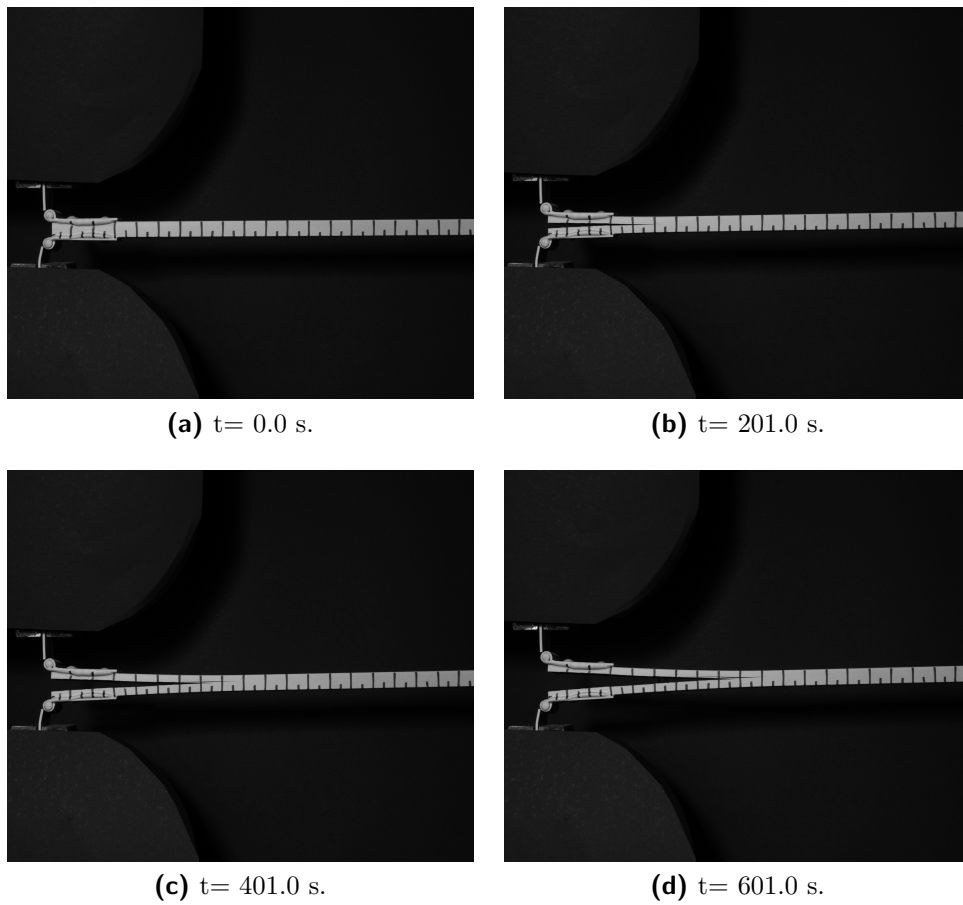
**Figure G.5:** Mode I delamination propagation in UD interface loaded at 250 mm/min (specimen LAM379-02).

Figures G.7 on page 243, G.8 on page 244, G.9 on page 245 and G.10 on page 246 report the evolution of delamination in DCB specimens with  $0/90^\circ$  interface for the different velocities tested.

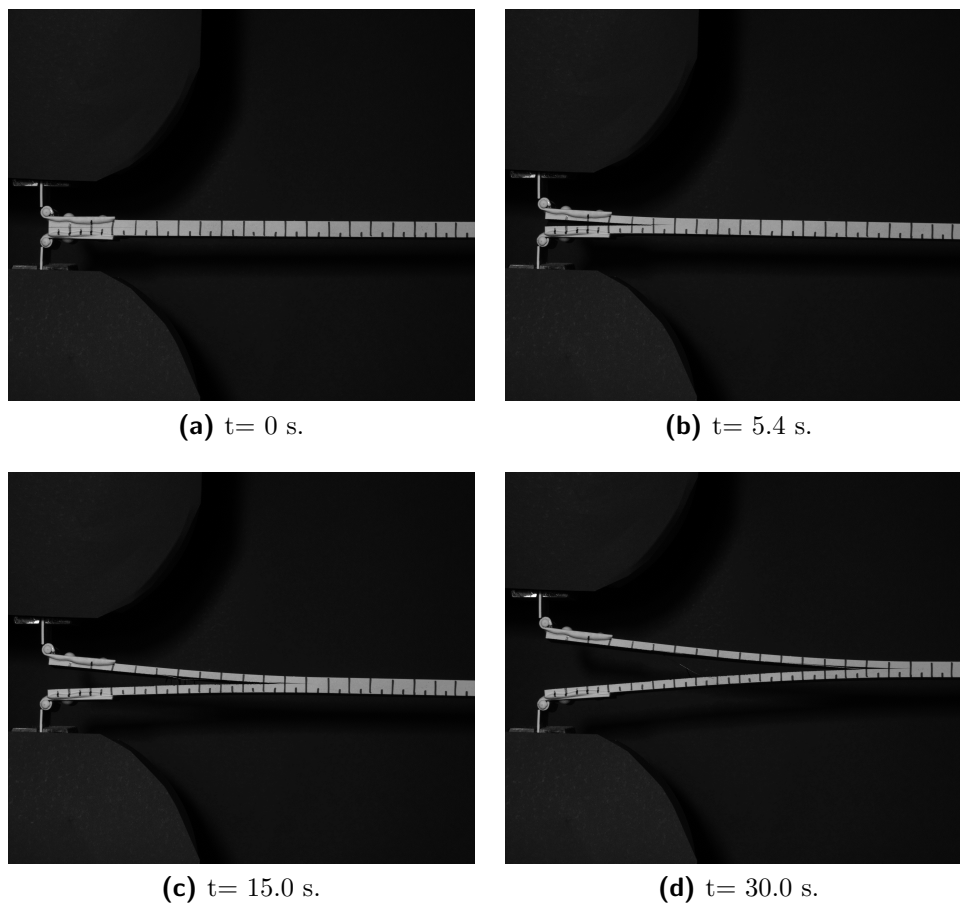


**Figure G.6:** Mode I delamination propagation in UD interface loaded at 500 mm/min (specimen LAM379-04).

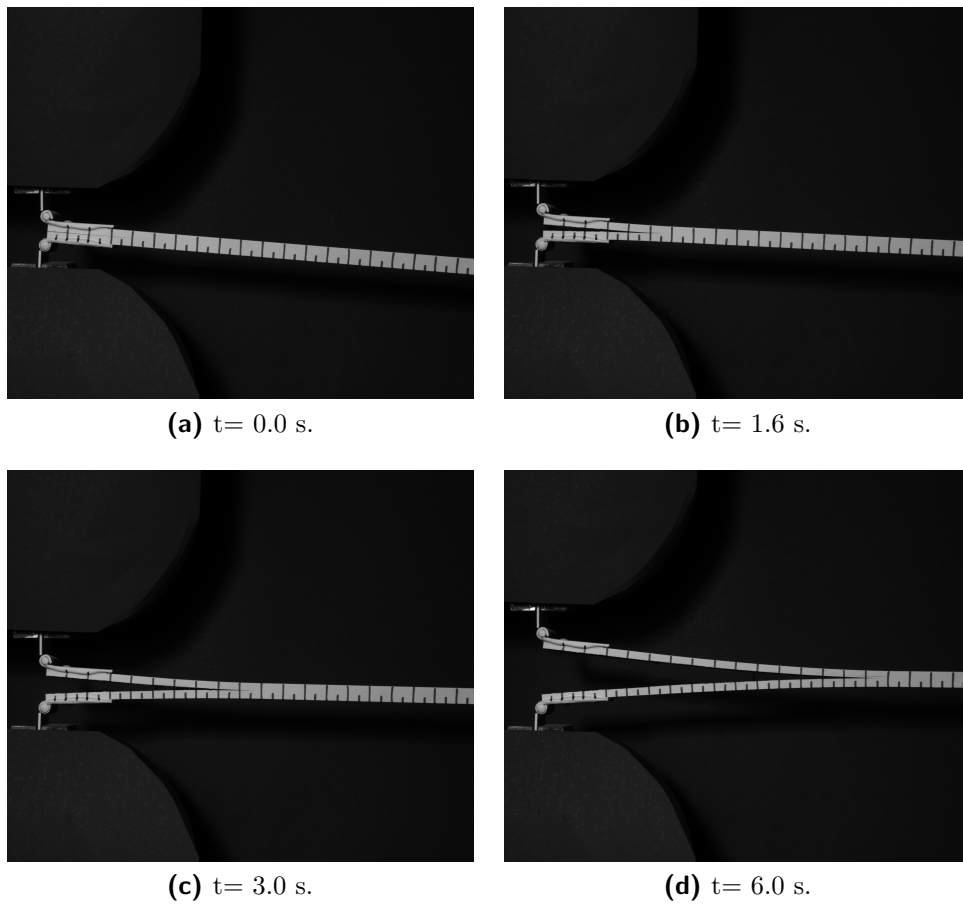




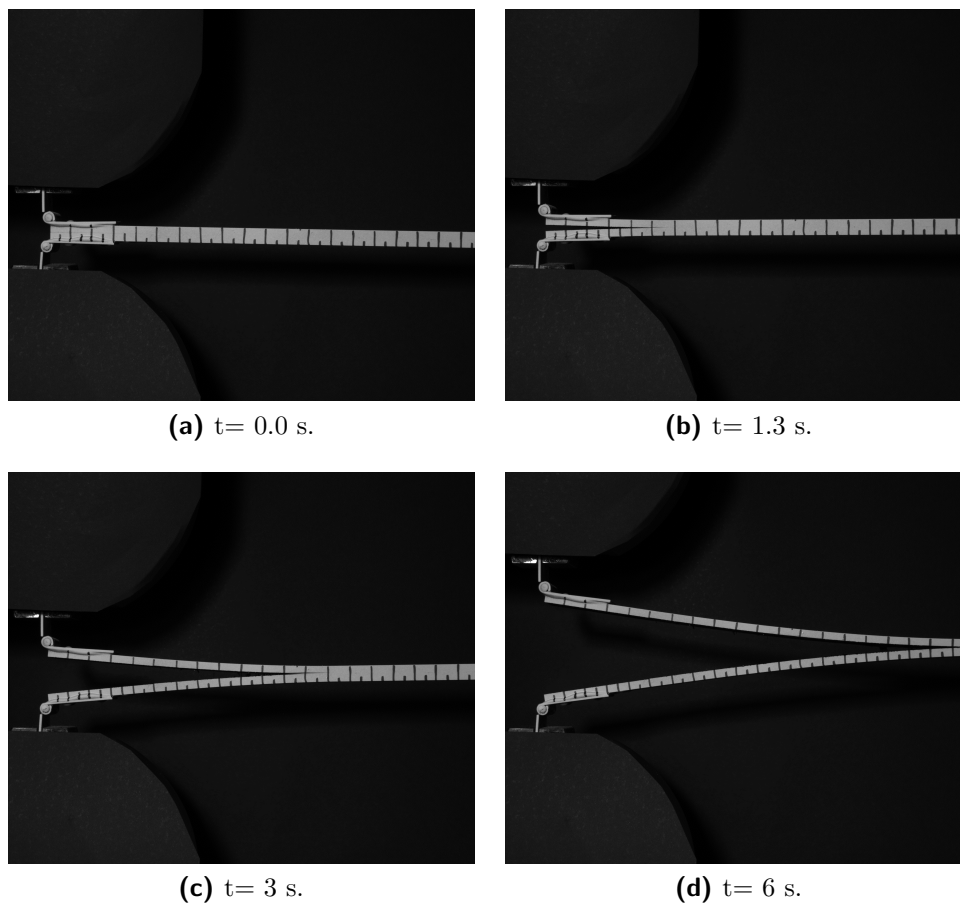
**Figure G.7:** Mode I delamination propagation in 0/90 interface loaded at 1 mm/min (specimen LAM374-09).



**Figure G.8:** Mode I delamination propagation in 0/90 interface loaded at 50 mm/min (specimen LAM374-08).



**Figure G.9:** Mode I delamination propagation in 0/90 interface loaded at 250 mm/min (specimen LAM374-07).



**Figure G.10:** Mode I delamination propagation in 0/90 interface loaded at 500 mm/min (specimen LAM374-06).

### G.3 Mode II

A complete list of the tests performed is reported in Table G.3.

**Table G.3:** ENF specimens tested.

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM370-01	-	1	Specimen loaded at quasi-static conditions.
LAM370-02	-	1	Specimen loaded at quasi-static conditions.
LAM370-03	-	1	Specimen loaded at quasi-static conditions.
LAM370-04	-	1	Specimen loaded at quasi-static conditions.
LAM370-05	-	1	Specimen loaded at quasi-static conditions.
LAM370-06	-	50	Specimen loaded directly at high velocity.
LAM370-07	-	50	Specimen loaded directly at high velocity.
LAM370-08	-	50	Specimen loaded directly at high velocity.
LAM370-09	-	50	Specimen loaded directly at high velocity.
LAM370-10	-	50	Specimen loaded directly at high velocity.
LAM370-11	-	250	Specimen loaded directly at high velocity.
LAM370-12	-	250	Specimen loaded directly at high velocity.
LAM371-01	-	250	Specimen loaded directly at high velocity.
LAM371-02	-	250	Specimen loaded directly at high velocity.
LAM371-03	-	250	Specimen loaded directly at high velocity.

*Table G.3: continues in the next page*

*Table G.3: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM371-04	-	500	Specimen loaded directly at high velocity.
LAM371-05	-	500	Specimen loaded directly at high velocity.
LAM371-06	-	500	Specimen loaded directly at high velocity.
LAM371-07	-	500	Specimen loaded directly at high velocity.
LAM371-08	-	500	Specimen loaded directly at high velocity.
LAM371-09	-	1	Specimen mounted in non-standard position and loaded at quasi-static conditions.
LAM371-10	-	50	Specimen mounted in non-standard position and loaded directly at high velocity.
LAM376-01	-	1	Specimen loaded a first time with teflon film as starter; then loaded a second time with an initial delamination of 70 [mm].
LAM376-02	-	1	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 65 [mm], 100 [mm] and 160 [mm].
LAM376-03	-	1	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 65 [mm] and 100 [mm].
LAM376-04	-	1	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm] and 110 [mm].

*Table G.3: continues in the next page*

*Table G.3: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM376-05	-	1	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 75 [mm] and 125 [mm].
LAM376-06	-	50	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 105 [mm] and 145 [mm].
LAM376-07	-	50	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 110 [mm] and 155 [mm].
LAM376-08	-	50	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 105 [mm] and 140 [mm].
LAM376-09	-	50	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 115 [mm] and 155 [mm].
LAM376-10	-	50	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 65 [mm], 95 [mm] and 125 [mm].
LAM376-11	-	250	Specimen loaded directly at high velocity.
LAM376-12	-	250	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 110 [mm] and 160 [mm].
LAM377-01	-	250	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 60 [mm], 100 [mm] and 150 [mm].

*Table G.3: continues in the next page*

*Table G.3: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM377-02	-	250	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm] and 120 [mm].
LAM377-03	-	250	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 110 [mm] and 150 [mm].
LAM377-04	-	250	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 75 [mm] and 125 [mm].
LAM377-05	-	500	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 65 [mm] and 100 [mm].
LAM377-06	-	500	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 105 [mm] and 150 [mm].
LAM377-07	-	500	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 105 [mm] and 145 [mm].
LAM377-08	-	500	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 75 [mm] and 125 [mm].
LAM377-09	-	500	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 45 [mm] and 130 [mm].

*Table G.3: continues in the next page*



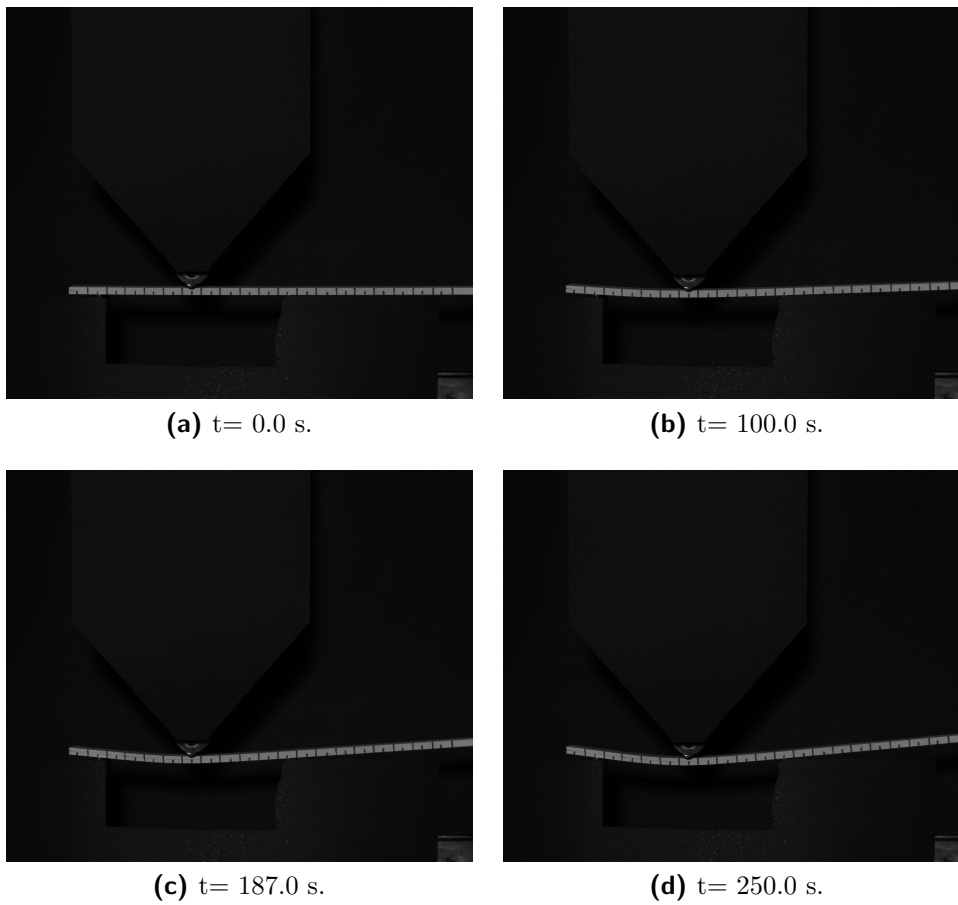
*Table G.3: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM377-10	-	500	Specimen loaded a first time with teflon film as starter; then loaded with initial delaminations of 70 [mm], 115 [mm] and 155 [mm].
LAM377-11	-	1	Specimen mounted in non-standard position and loaded at quasi-static conditions.

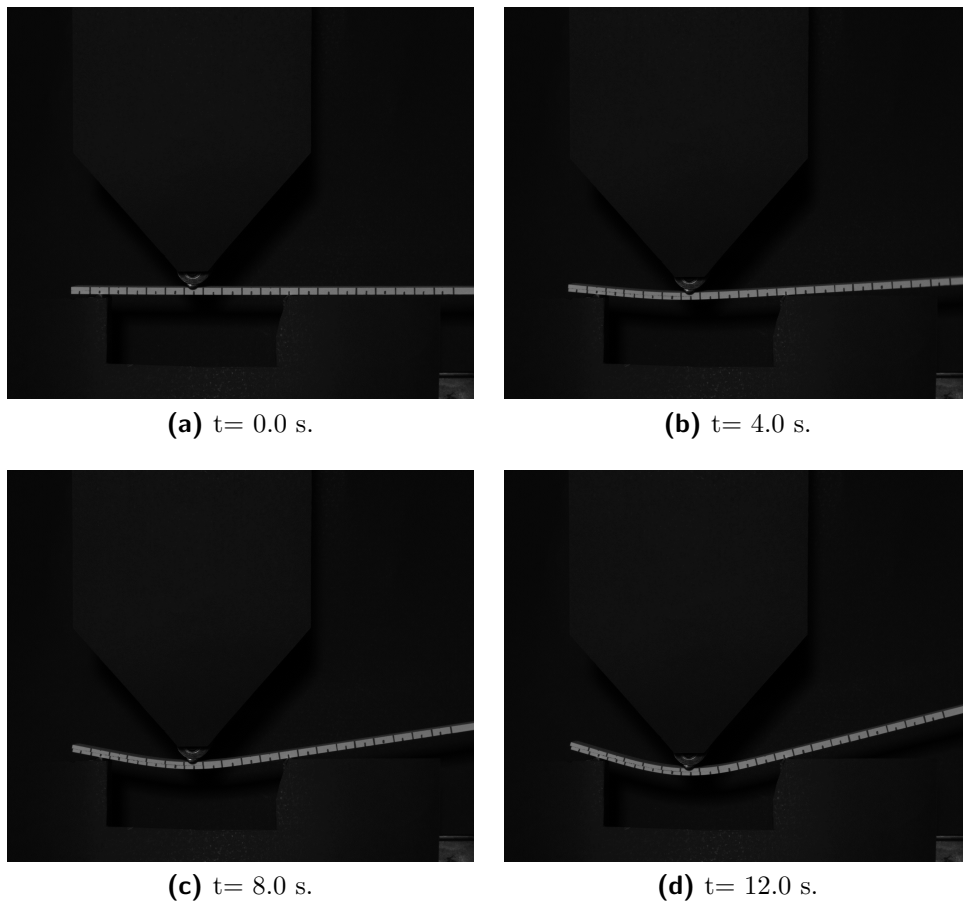
*Table G.3: ends from previous page.*

Figures G.11 on the following page, G.12 on page 253, G.13 on page 254 and G.14 on page 255 report the evolution of delamination in ENF specimens for the different velocities tested.

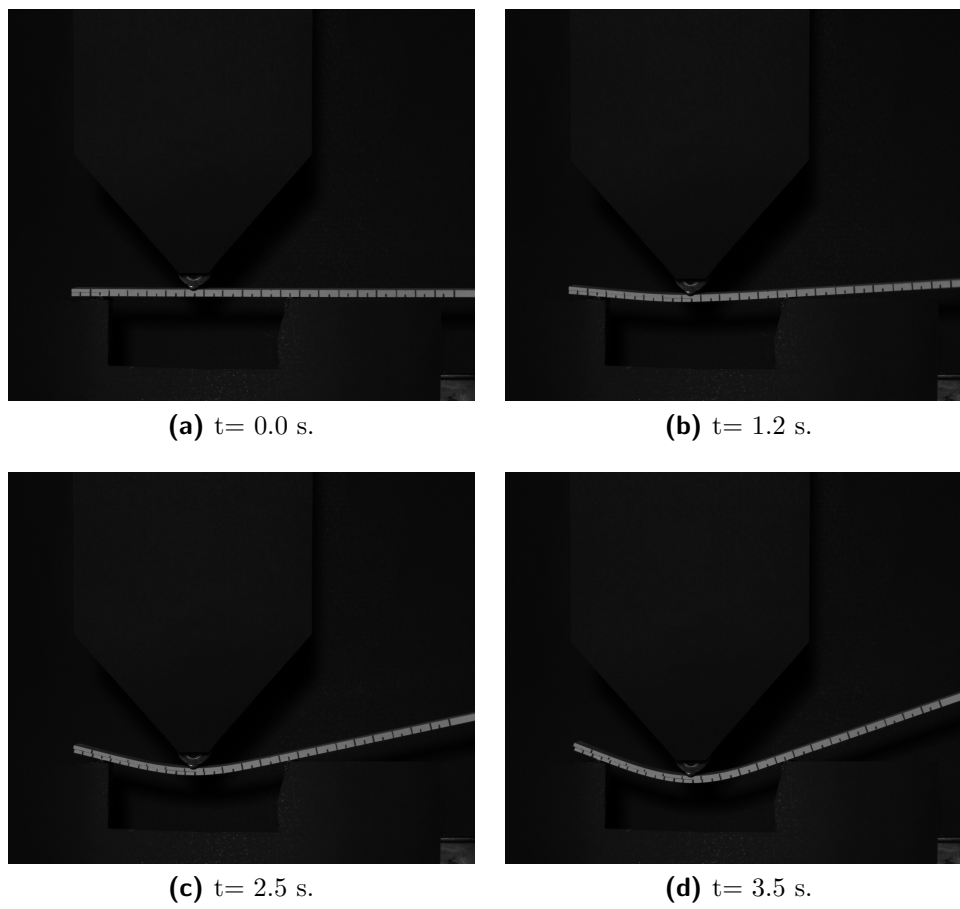
Figure G.15 on page 256 show the different damage mechanisms that are triggered at the final failure of the specimen, which is caused by fibers failure under bending and not by delamination.



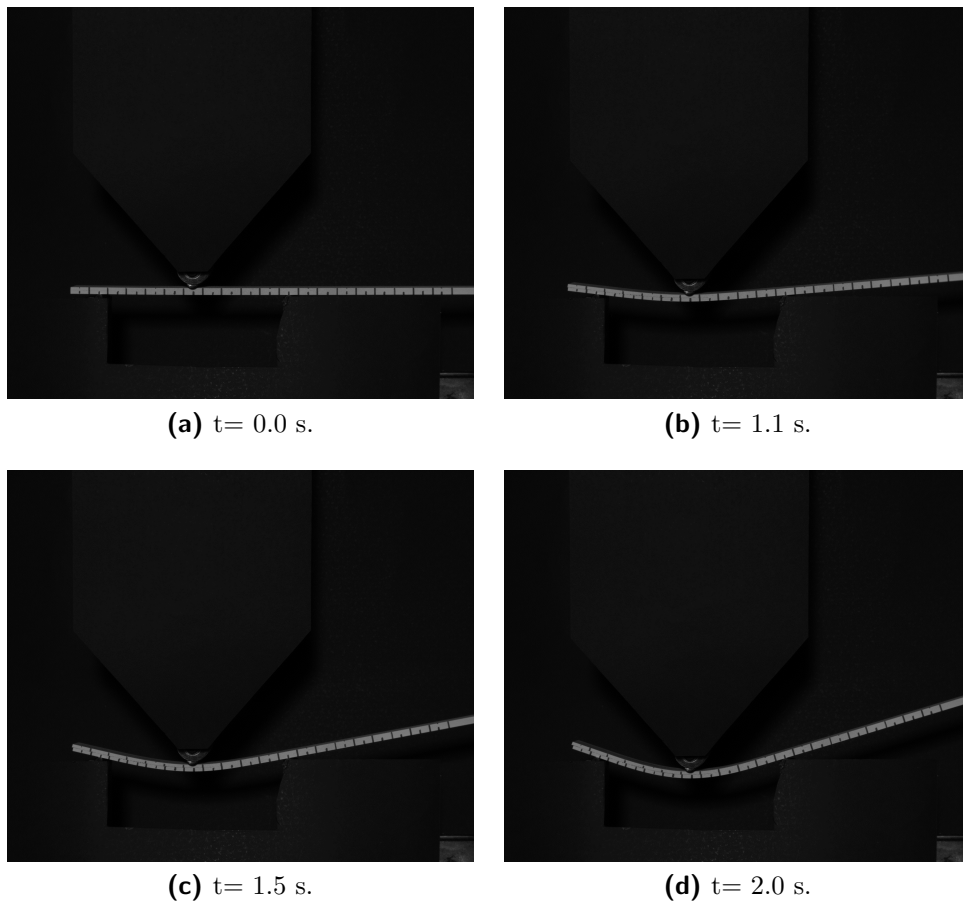
**Figure G.11:** Mode II delamination propagation loaded at 1 mm/min (specimen LAM370-05).



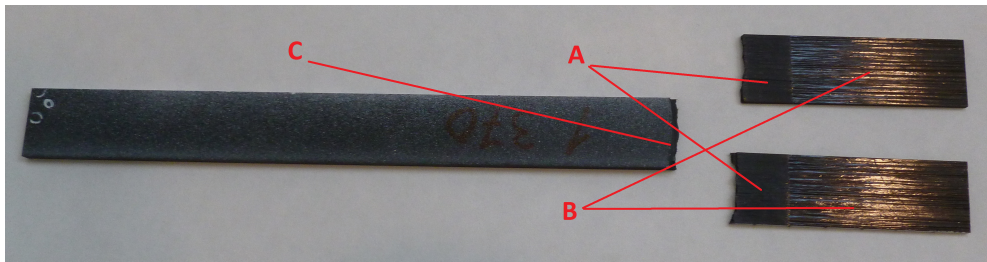
**Figure G.12:** Mode II delamination propagation loaded at 50 mm/min (specimen LAM370-08).



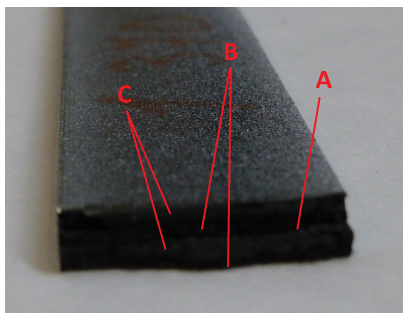
**Figure G.13:** Mode II delamination propagation loaded at 250 mm/min (specimen LAM370-12).



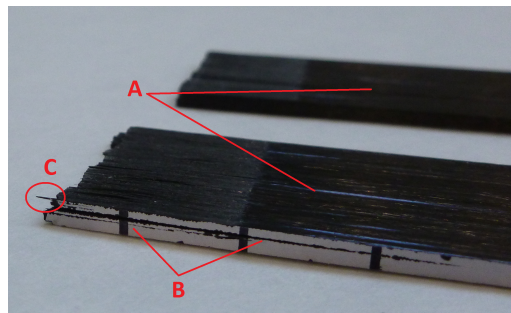
**Figure G.14:** Mode II delamination propagation loaded at 500 mm/min (specimen LAM371-05).



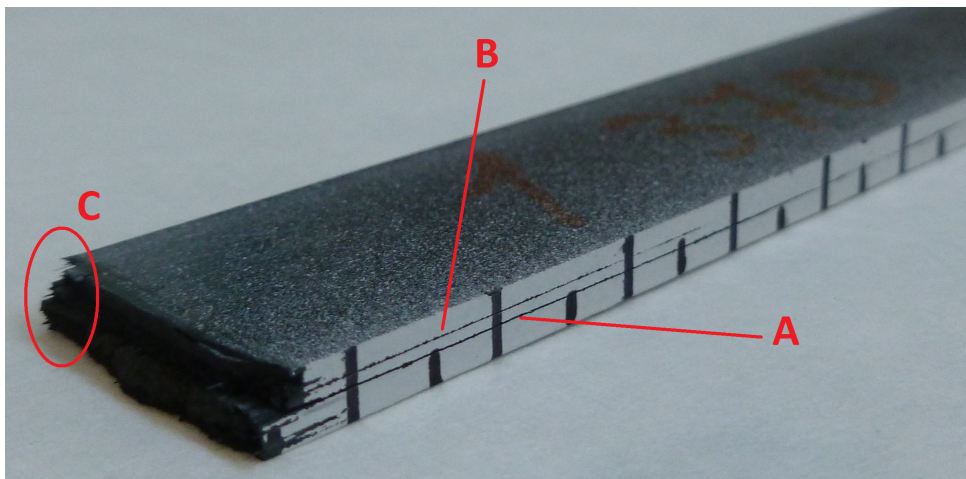
(a) Specimen split in three parts after final failure: A. propagated delamination; B. position of the teflon insert; C. line where loading is applied and final failure occurs.



(b) Main part of broken specimen: A. propagated delamination; B. through-thickness bands loaded in tension; C. through-thickness bands loaded in compression.



(c) Secondary cracking mechanisms associated with final failure: A. main delamination surfaces; B. secondary delaminations; C. fiber pull-out.



(d) Secondary cracking mechanisms associated with final failure: A. main delamination; B. secondary delamination; C. fiber pull-out.

**Figure G.15:** Final failure of mode II specimens.

## G.4 Mixed mode I-II

A complete list of the tests performed is reported in Table G.4.

**Table G.4:** MMB specimens tested.

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM372-01	-	1	Specimen loaded directly at quasi-static conditions.
LAM372-02	-	1	Specimen loaded directly at quasi-static conditions.
LAM372-03	-	1	Upper hinge detached.
LAM372-04	-	1	Specimen loaded directly at quasi-static conditions.
LAM372-05	-	1	Specimen loaded directly at quasi-static conditions.
LAM372-06	-	50	Upper hinge detached.
LAM372-07	-	50	Upper hinge detached.
LAM372-08	-	50	Upper hinge detached.
LAM372-09	-	50	Specimen loaded directly at high velocity.
LAM372-10	-	50	Specimen loaded directly at high velocity.
LAM373-01	-	250	Specimen loaded directly at high velocity.
LAM373-02	-	250	Specimen loaded directly at high velocity.
LAM373-03	-	250	Specimen loaded directly at high velocity.
LAM373-04	-	250	Specimen loaded directly at high velocity.
LAM373-05	-	250	Upper hinge detached.
LAM373-06	-	250	Specimen loaded directly at high velocity.
LAM373-07	-	500	Specimen loaded directly at high velocity.
LAM373-08	-	500	Specimen loaded directly at high velocity.

*Table G.4: continues in the next page*

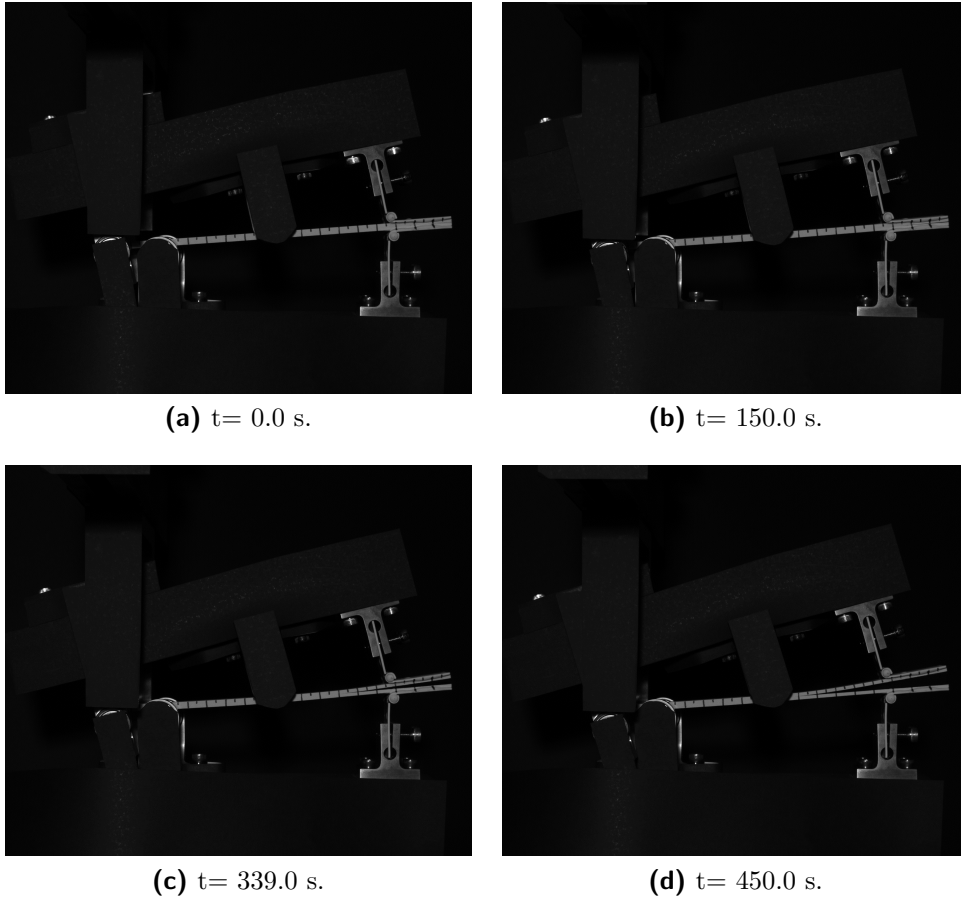
*Table G.4: continues from previous page*

Specimen	Pre-cracking velocity [mm/min]	Loading velocity [mm/min]	Additional notes and features
LAM373-09	-	500	Specimen loaded directly at high velocity.
LAM373-10	-	500	Specimen loaded directly at high velocity.
LAM373-11	-	500	Specimen loaded directly at high velocity.
LAM373-12	-	500	Specimen loaded directly at high velocity.
LAM378-01	-	50	Upper hinge detached.
LAM378-02	-	50	Upper hinge detached.
LAM378-03	-	50	Upper hinge detached.
LAM378-04	-	250	Specimen loaded directly at high velocity.
LAM378-05	-	1	Upper hinge detached.
LAM378-06	-	50	Upper hinge detached.
LAM378-07	-	50	Upper hinge detached.
LAM378-08	-	500	Upper hinge detached.
LAM378-09	-	50	Specimen loaded directly at high velocity.
LAM378-10	-	50	Specimen loaded directly at high velocity.
LAM378-11	-	50	Specimen loaded directly at high velocity.
LAM378-12	-	50	Specimen loaded directly at high velocity.
LAM379-08	-	1	Specimen loaded directly at quasi-static conditions.
LAM379-09	-	1	Specimen loaded directly at quasi-static conditions.
LAM379-10	1	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.
LAM379-11	1	500	Specimen loaded in quasi-static conditions, unloaded and reloaded at high velocity.

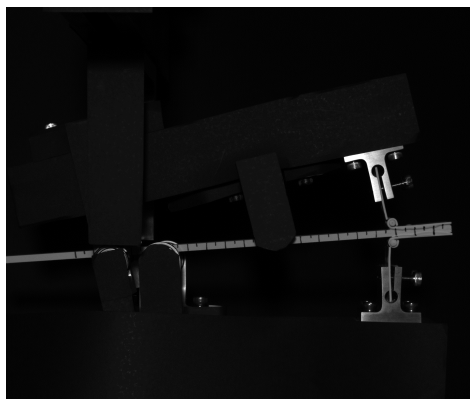
*Table G.4: ends from previous page.*



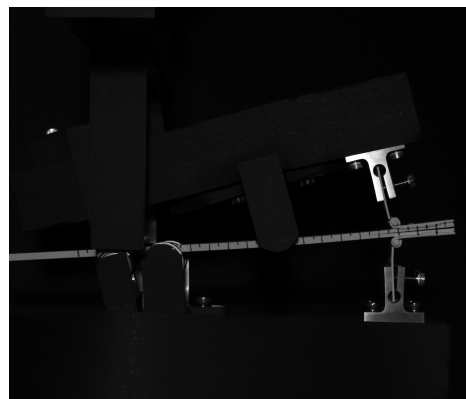
Figures G.16, G.17 on the next page, G.18 on page 261 and G.19 on page 262 report the evolution of delamination in MMB specimens for the different velocities tested.



**Figure G.16:** Mixed mode I-II delamination propagation loaded at 1 mm/min (specimen LAM372-02).



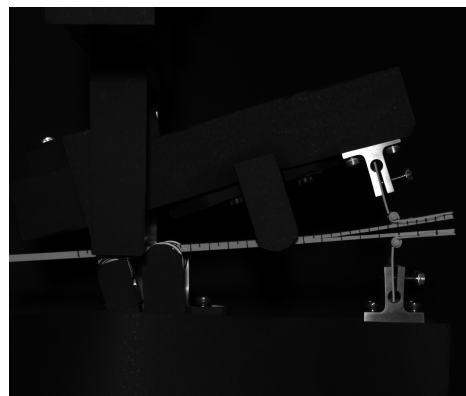
(a)  $t = 0.0$  s.



(b)  $t = 3.5$  s.

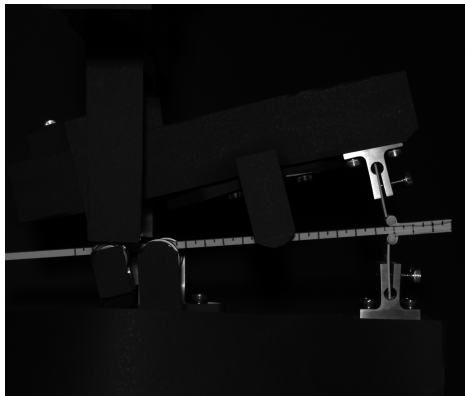


(c)  $t = 6.8$  s.

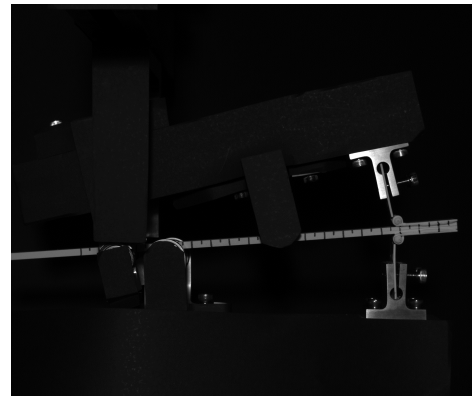


(d)  $t = 10.5$  s.

**Figure G.17:** Mixed mode I-II delamination propagation loaded at 50 mm/min (specimen LAM372-09).



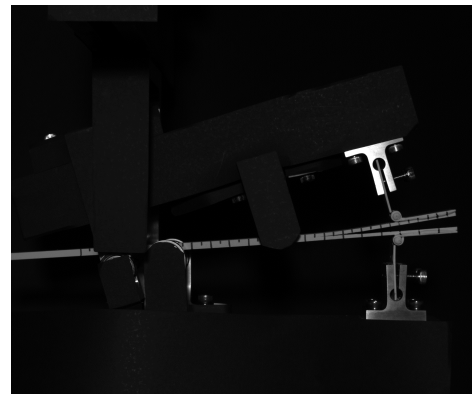
(a)  $t= 0.0$  s.



(b)  $t= 0.7$  s.

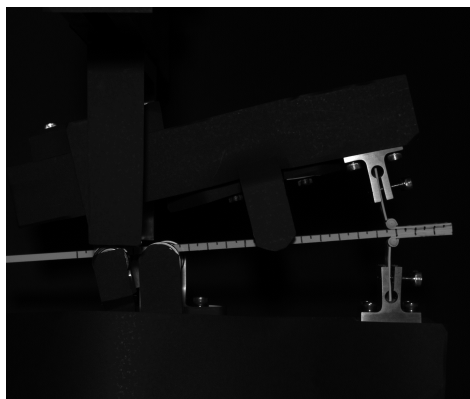


(c)  $t= 1.7$  s.

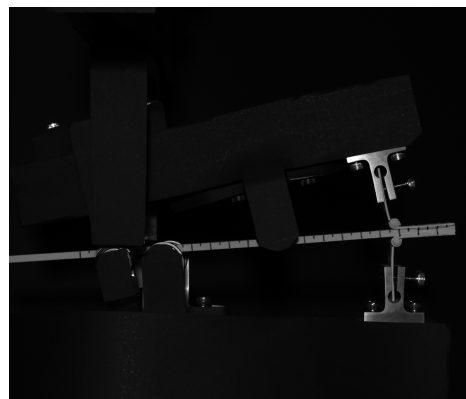


(d)  $t= 2.7$  s.

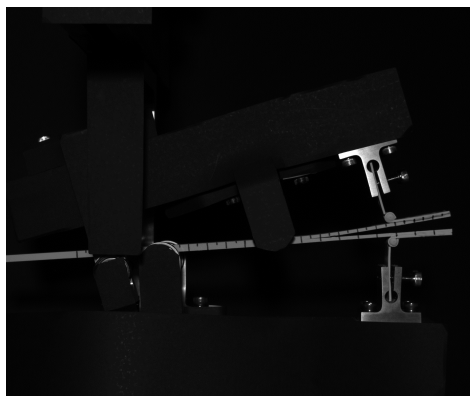
**Figure G.18:** Mixed mode I-II delamination propagation loaded at 250 mm/min (specimen LAM373-03).



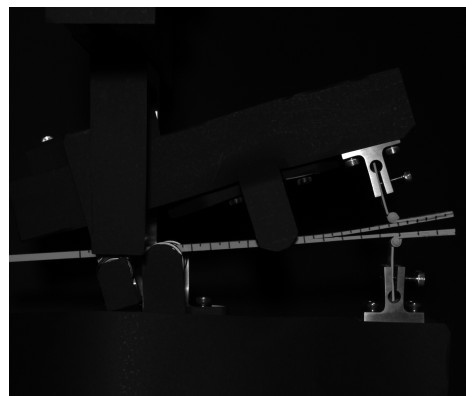
(a)  $t = 0.0$  s.



(b)  $t = 0.6$  s.



(c)  $t = 1.2$  s.



(d)  $t = 1.8$  s.

**Figure G.19:** Mixed mode I-II delamination propagation loaded at 500 mm/min (specimen LAM373-08).

### G.4.1 MatLab code

Code has been developed in Matlab environment for data analysis and post-processing of experimental data collected from the Instron tensile machine. Exemplifying excerpt are reported.

*Mode I*

```
clear all
close all
clc

LAM365_01=xlsread('LAM365.xls','LAM365-01');
LAM365_02=xlsread('LAM365.xls','LAM365-02');
LAM365_03=xlsread('LAM365.xls','LAM365-03');
LAM365_04=xlsread('LAM365.xls','LAM365-04');
LAM365_05=xlsread('LAM365.xls','LAM365-05');
LAM365_06=xlsread('LAM365.xls','LAM365-06');
LAM365_07=xlsread('LAM365.xls','LAM365-07');
LAM365_08=xlsread('LAM365.xls','LAM365-08');
LAM365_09=xlsread('LAM365.xls','LAM365-09');
LAM365_10=xlsread('LAM365.xls','LAM365-10');
LAM365_12=xlsread('LAM365.xls','LAM365-12');

LAM366_01=xlsread('LAM366.xls','LAM366-01');
LAM366_02=xlsread('LAM366.xls','LAM366-02');
LAM366_03=xlsread('LAM366.xls','LAM366-03');
LAM366_04=xlsread('LAM366.xls','LAM366-04');
LAM366_05=xlsread('LAM366.xls','LAM366-05');
LAM366_06=xlsread('LAM366.xls','LAM366-06');
LAM366_07=xlsread('LAM366.xls','LAM366-07');
LAM366_08=xlsread('LAM366.xls','LAM366-08');
LAM366_09=xlsread('LAM366.xls','LAM366-09');
LAM366_10=xlsread('LAM366.xls','LAM366-10');
LAM366_11=xlsread('LAM366.xls','LAM366-11');

LAM377_12=xlsread('LAM377.xls','LAM377-12');

LAM379_01=xlsread('LAM379.xls','LAM379-01');
LAM379_02=xlsread('LAM379.xls','LAM379-02');
LAM379_03=xlsread('LAM379.xls','LAM379-03');
LAM379_04=xlsread('LAM379.xls','LAM379-04');
LAM379_05=xlsread('LAM379.xls','LAM379-05');
LAM379_06=xlsread('LAM379.xls','LAM379-06');
```

```
LAM379_07=xlsread('LAM379.xls','LAM379-07');

modeI_vel1_c1=xlsread('modeI_vel1_c1.xls');
modeI_vel1_c2=xlsread('modeI_vel1_c2.xls');
modeI_vel1_c3=xlsread('modeI_vel1_c3.xls');

modeI_vel50_c1=xlsread('modeI_vel50_c1.xls');
modeI_vel50_c2=xlsread('modeI_vel50_c2.xls');
modeI_vel50_c3=xlsread('modeI_vel50_c3.xls');

modeI_vel250_c1=xlsread('modeI_vel250_c1.xls');
modeI_vel250_c2=xlsread('modeI_vel250_c2.xls');
modeI_vel250_c3=xlsread('modeI_vel250_c3.xls');
modeI_vel250_c4=xlsread('modeI_vel250_c4.xls');

modeI_vel500_c1=xlsread('modeI_vel500_c1.xls');
modeI_vel500_c2=xlsread('modeI_vel500_c2.xls');
modeI_vel500_c3=xlsread('modeI_vel500_c3.xls');
modeI_vel500_c4=xlsread('modeI_vel500_c4.xls');

modeI_imperf_vel1=xlsread('ModeI_imperfections_vel1.xls');
modeI_imperf_vel50=xlsread('ModeI_imperfections_vel2.xls');
modeI_imperf_vel250=xlsread('ModeI_imperfections_vel3.xls');
modeI_imperf_vel500=xlsread('ModeI_imperfections_vel4.xls');

f1=figure(1);
plot(LAM366_06(:,2)*10^-5,LAM366_06(:,3)*10^-5,'b')
hold on
plot(modeI_vel1_c1(:,1),2*modeI_vel1_c1(:,2),'r')
hold on
plot(modeI_imperf_vel1(:,1),
      2*modeI_imperf_vel1(:,2),'g')
hold on
plot(LAM366_07(:,2)*10^-5,LAM366_07(:,3)*10^-5,'b')
hold on
plot(LAM366_08(:,2)*10^-5,LAM366_08(:,3)*10^-5,'b')
hold on
plot(LAM366_09(:,2)*10^-5,LAM366_09(:,3)*10^-5,'b')
hold on
plot(modeI_vel1_c3(:,1),2*modeI_vel1_c3(:,2),'r')
hold on
grid on
legend('Experimental','Numerical-perfect_layer',
       'Numerical-imperfect_layer','Location','Best')
```

```

xlabel( 'Displacement \delta [mm] ' )
ylabel( 'Load P [N] ' )

f2=figure ( 2 );
plot ( LAM377_12(:,2)*10^-5, LAM377_12(:,3)*10^-5, 'b' )
hold on
plot ( modeI_vel50_c1(:,1), 2*modeI_vel50_c1(:,2), 'r' )
hold on
plot ( modeI_imperf_vel50(:,1),
      2*modeI_imperf_vel50(:,2), 'g' )
hold on
plot ( LAM379_01(:,2)*10^-5, LAM379_01(:,3)*10^-5, 'b' )
hold on
plot ( modeI_vel50_c2(:,1), 2*modeI_vel50_c2(:,2), 'r' )
hold on
plot ( modeI_vel50_c3(:,1), 2*modeI_vel50_c3(:,2), 'r' )
hold on
grid on
legend( 'Experimental', 'Numerical-perfect_layer',
        'Numerical-imperfect_layer', 'Location', 'Best' )
xlabel( 'Displacement \delta [mm] ' )
ylabel( 'Load P [N] ' )

f3=figure ( 3 );
plot ( LAM379_02(:,2)*10^-5, LAM379_02(:,3)*10^-5, 'b' )
hold on
plot ( modeI_vel250_c1(:,1), 2*modeI_vel250_c1(:,2), 'r' )
hold on
plot ( modeI_imperf_vel250(:,1),
      2*modeI_imperf_vel250(:,2), 'g' )
hold on
plot ( LAM379_07(:,2)*10^-5, LAM379_07(:,3)*10^-5, 'b' )
hold on
plot ( LAM379_03(:,2)*10^-5, LAM379_03(:,3)*10^-5, 'b' )
hold on
plot ( modeI_vel250_c2(:,1), 2*modeI_vel250_c2(:,2), 'r' )
hold on
plot ( modeI_vel250_c3(:,1), 2*modeI_vel250_c3(:,2), 'r' )
hold on
plot ( modeI_vel250_c4(:,1), 2*modeI_vel250_c4(:,2), 'r' )
hold on
grid on
legend( 'Experimental', 'Numerical-perfect_layer',
        'Numerical-imperfect_layer', 'Location', 'Best' )

```

```
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[N]')

f4=figure(4);
plot(LAM379_04(:,2)*10^-5,LAM379_04(:,3)*10^-5,'b')
hold on
plot(modeI_vel500_c1(:,1),2*modeI_vel500_c1(:,2),'r')
hold on
plot(modeI_imperf_vel500(:,1),
      2*modeI_imperf_vel500(:,2),'g')
hold on
plot(LAM379_05(:,2)*10^-5,LAM379_05(:,3)*10^-5,'b')
hold on
plot(LAM379_06(:,2)*10^-5,LAM379_06(:,3)*10^-5,'b')
hold on
plot(modeI_vel500_c2(:,1),2*modeI_vel500_c2(:,2),'r')
hold on
plot(modeI_vel500_c3(:,1),2*modeI_vel500_c3(:,2),'r')
hold on
plot(modeI_vel500_c4(:,1),2*modeI_vel500_c4(:,2),'r')
hold on
grid on
legend('Experimental','Numerical-perfect_layer',
       'Numerical-imperfect_layer','Location','Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[N]')

saveas(f1,'comp_modeI_UD_vel1.pdf')
saveas(f2,'comp_modeI_UD_vel50.pdf')
saveas(f3,'comp_modeI_UD_vel250.pdf')
saveas(f4,'comp_modeI_UD_vel500.pdf')
```

### *Mode II*

```
clear all
close all
clc

LAM370_01=xlsread('LAM370.xls','LAM370-01');
LAM370_02=xlsread('LAM370.xls','LAM370-02');
LAM370_03=xlsread('LAM370.xls','LAM370-03');
LAM370_04=xlsread('LAM370.xls','LAM370-04');
LAM370_05=xlsread('LAM370.xls','LAM370-05');
```



```
LAM370_06=xlsread('LAM370.xls','LAM370-06');  
LAM370_07=xlsread('LAM370.xls','LAM370-07');  
LAM370_08=xlsread('LAM370.xls','LAM370-08');  
LAM370_09=xlsread('LAM370.xls','LAM370-09');  
LAM370_10=xlsread('LAM370.xls','LAM370-10');  
LAM370_11=xlsread('LAM370.xls','LAM370-11');  
LAM370_12=xlsread('LAM370.xls','LAM370-12');
```

```
LAM371_01=xlsread('LAM371.xls','LAM371-01');  
LAM371_02=xlsread('LAM371.xls','LAM371-02');  
LAM371_03=xlsread('LAM371.xls','LAM371-03');  
LAM371_04=xlsread('LAM371.xls','LAM371-04');  
LAM371_05=xlsread('LAM371.xls','LAM371-05');  
LAM371_06=xlsread('LAM371.xls','LAM371-06');  
LAM371_07=xlsread('LAM371.xls','LAM371-07');  
LAM371_08=xlsread('LAM371.xls','LAM371-08');  
LAM371_09=xlsread('LAM371.xls','LAM371-09');  
LAM371_10=xlsread('LAM371.xls','LAM371-10');
```

```
LAM376_01_01=xlsread('LAM376.xls','LAM376-01_01');  
LAM376_01_02=xlsread('LAM376.xls','LAM376-01_02');
```

```
LAM376_02_01=xlsread('LAM376.xls','LAM376-02_01');  
LAM376_02_02=xlsread('LAM376.xls','LAM376-02_02');  
LAM376_02_03=xlsread('LAM376.xls','LAM376-02_03');  
LAM376_02_04=xlsread('LAM376.xls','LAM376-02_04');
```

```
LAM376_03_01=xlsread('LAM376.xls','LAM376-03_01');  
LAM376_03_02=xlsread('LAM376.xls','LAM376-03_02');  
LAM376_03_03=xlsread('LAM376.xls','LAM376-03_03');
```

```
LAM376_04_01=xlsread('LAM376.xls','LAM376-04_01');  
LAM376_04_02=xlsread('LAM376.xls','LAM376-04_02');  
LAM376_04_03=xlsread('LAM376.xls','LAM376-04_03');  
LAM376_04_04=xlsread('LAM376.xls','LAM376-04_04');
```

```
LAM376_05_01=xlsread('LAM376.xls','LAM376-05_01');  
LAM376_05_02=xlsread('LAM376.xls','LAM376-05_02');  
LAM376_05_03=xlsread('LAM376.xls','LAM376-05_03');
```

```
LAM376_06_01=xlsread('LAM376.xls','LAM376-06_01');  
LAM376_06_02=xlsread('LAM376.xls','LAM376-06_02');  
LAM376_06_03=xlsread('LAM376.xls','LAM376-06_03');
```

```
LAM376_06_04=xlsread('LAM376.xls','LAM376-06_04');

LAM376_07_01=xlsread('LAM376.xls','LAM376-07_01');
LAM376_07_02=xlsread('LAM376.xls','LAM376-07_02');
LAM376_07_03=xlsread('LAM376.xls','LAM376-07_03');
LAM376_07_04=xlsread('LAM376.xls','LAM376-07_04');

LAM376_08_01=xlsread('LAM376.xls','LAM376-08_01');
LAM376_08_02=xlsread('LAM376.xls','LAM376-08_02');
LAM376_08_03=xlsread('LAM376.xls','LAM376-08_03');
LAM376_08_04=xlsread('LAM376.xls','LAM376-08_04');

LAM376_09_01=xlsread('LAM376.xls','LAM376-09_01');
LAM376_09_02=xlsread('LAM376.xls','LAM376-09_02');
LAM376_09_03=xlsread('LAM376.xls','LAM376-09_03');
LAM376_09_04=xlsread('LAM376.xls','LAM376-09_04');

LAM376_10_01=xlsread('LAM376.xls','LAM376-10_01');
LAM376_10_02=xlsread('LAM376.xls','LAM376-10_02');
LAM376_10_03=xlsread('LAM376.xls','LAM376-10_03');
LAM376_10_04=xlsread('LAM376.xls','LAM376-10_04');

LAM376_11=xlsread('LAM376.xls','LAM376-11');

LAM376_12_01=xlsread('LAM376.xls','LAM376-12_01');
LAM376_12_02=xlsread('LAM376.xls','LAM376-12_02');
LAM376_12_03=xlsread('LAM376.xls','LAM376-12_03');
LAM376_12_04=xlsread('LAM376.xls','LAM376-12_04');

LAM377_01_01=xlsread('LAM377.xls','LAM377-01_01');
LAM377_01_02=xlsread('LAM377.xls','LAM377-01_02');
LAM377_01_03=xlsread('LAM377.xls','LAM377-01_03');
LAM377_01_04=xlsread('LAM377.xls','LAM377-01_04');

LAM377_02_01=xlsread('LAM377.xls','LAM377-02_01');
LAM377_02_02=xlsread('LAM377.xls','LAM377-02_02');
LAM377_02_03=xlsread('LAM377.xls','LAM377-02_03');

LAM377_03_01=xlsread('LAM377.xls','LAM377-03_01');
LAM377_03_02=xlsread('LAM377.xls','LAM377-03_02');
LAM377_03_03=xlsread('LAM377.xls','LAM377-03_03');
LAM377_03_04=xlsread('LAM377.xls','LAM377-03_04');
```

```
LAM377_04_01=xlsread('LAM377.xls','LAM377-04_01');  
LAM377_04_02=xlsread('LAM377.xls','LAM377-04_02');  
LAM377_04_03=xlsread('LAM377.xls','LAM377-04_03');
```

```
LAM377_05_01=xlsread('LAM377.xls','LAM377-05_01');  
LAM377_05_02=xlsread('LAM377.xls','LAM377-05_02');  
LAM377_05_03=xlsread('LAM377.xls','LAM377-05_03');
```

```
LAM377_06_01=xlsread('LAM377.xls','LAM377-06_01');  
LAM377_06_02=xlsread('LAM377.xls','LAM377-06_02');  
LAM377_06_03=xlsread('LAM377.xls','LAM377-06_03');  
LAM377_06_04=xlsread('LAM377.xls','LAM377-06_04');
```

```
LAM377_07_01=xlsread('LAM377.xls','LAM377-07_01');  
LAM377_07_02=xlsread('LAM377.xls','LAM377-07_02');  
LAM377_07_03=xlsread('LAM377.xls','LAM377-07_03');  
LAM377_07_04=xlsread('LAM377.xls','LAM377-07_04');
```

```
LAM377_08_01=xlsread('LAM377.xls','LAM377-08_01');  
LAM377_08_02=xlsread('LAM377.xls','LAM377-08_02');  
LAM377_08_03=xlsread('LAM377.xls','LAM377-08_03');
```

```
LAM377_09_01=xlsread('LAM377.xls','LAM377-09_01');  
LAM377_09_02=xlsread('LAM377.xls','LAM377-09_02');  
LAM377_09_03=xlsread('LAM377.xls','LAM377-09_03');
```

```
LAM377_10_01=xlsread('LAM377.xls','LAM377-10_01');  
LAM377_10_02=xlsread('LAM377.xls','LAM377-10_02');  
LAM377_10_03=xlsread('LAM377.xls','LAM377-10_03');  
LAM377_10_04=xlsread('LAM377.xls','LAM377-10_04');
```

```
LAM377_11=xlsread('LAM377.xls','LAM377-11');
```

```
coeff_sort=0.25;
```

```
sorted_LAM370_01=sortrows(LAM370_01(1:ceil  
    (coeff_sort*length(LAM370_01)),:),-4);  
sorted_LAM370_02=sortrows(LAM370_02(1:ceil  
    (coeff_sort*length(LAM370_02)),:),-4);  
sorted_LAM370_03=sortrows(LAM370_03(1:ceil  
    (coeff_sort*length(LAM370_03)),:),-4);  
sorted_LAM370_04=sortrows(LAM370_04(1:ceil  
    (coeff_sort*length(LAM370_04)),:),-4);  
sorted_LAM370_05=sortrows(LAM370_05(1:ceil
```

```
(coeff_sort*length(LAM370_05)),:),-4);
sorted_LAM370_06=sortrows(LAM370_06(1:ceil
(coeff_sort*length(LAM370_06)),:),-4);
sorted_LAM370_07=sortrows(LAM370_07(1:ceil
(coeff_sort*length(LAM370_07)),:),-4);
sorted_LAM370_08=sortrows(LAM370_08(1:ceil
(coeff_sort*length(LAM370_08)),:),-4);
sorted_LAM370_09=sortrows(LAM370_09(1:ceil
(coeff_sort*length(LAM370_09)),:),-4);
sorted_LAM370_10=sortrows(LAM370_10(1:ceil
(coeff_sort*length(LAM370_10)),:),-4);
sorted_LAM370_11=sortrows(LAM370_11(1:ceil
(coeff_sort*length(LAM370_11)),:),-4);
sorted_LAM370_12=sortrows(LAM370_12(1:ceil
(coeff_sort*length(LAM370_12)),:),-4);

sorted_LAM371_01=sortrows(LAM371_01(1:ceil
(coeff_sort*length(LAM371_01)),:),-4);
sorted_LAM371_02=sortrows(LAM371_02(1:ceil
(coeff_sort*length(LAM371_02)),:),-4);
sorted_LAM371_03=sortrows(LAM371_03(1:ceil
(coeff_sort*length(LAM371_03)),:),-4);
sorted_LAM371_04=sortrows(LAM371_04(1:ceil
(coeff_sort*length(LAM371_04)),:),-4);
sorted_LAM371_05=sortrows(LAM371_05(1:ceil
(coeff_sort*length(LAM371_05)),:),-4);
sorted_LAM371_06=sortrows(LAM371_06(1:ceil
(coeff_sort*length(LAM371_06)),:),-4);
sorted_LAM371_07=sortrows(LAM371_07(1:ceil
(coeff_sort*length(LAM371_07)),:),-4);
sorted_LAM371_08=sortrows(LAM371_08(1:ceil
(coeff_sort*length(LAM371_08)),:),-4);
sorted_LAM371_09=sortrows(LAM371_09(1:ceil
(coeff_sort*length(LAM371_09)),:),-4);
sorted_LAM371_10=sortrows(LAM371_10(1:ceil
(coeff_sort*length(LAM371_10)),:),-4);

f1=figure(1);
plot(LAM370_01(:,5)*10^-5,LAM370_01(:,4)*10^-8,'b')
hold on
plot(LAM370_02(:,5)*10^-5,LAM370_02(:,4)*10^-8,'r')
hold on
plot(LAM370_03(:,5)*10^-5,LAM370_03(:,4)*10^-8,'g')
hold on
```

```

plot(LAM370_04(:,5)*10-5,LAM370_04(:,4)*10-8, 'k')
hold on
plot(LAM370_05(:,5)*10-5,LAM370_05(:,4)*10-8, 'm')
hold on
grid on
legend('LAM370\_01', 'LAM370\_02', 'LAM370\_03',
        'LAM370\_04', 'LAM370\_05', 'Location', 'Best')
xlabel('Displacement  $\Delta$  [mm]')
ylabel('Load  $P$  [kN]')

f2=figure(2);
plot(LAM370_06(:,5)*10-5,LAM370_06(:,4)*10-8, 'b')
hold on
plot(LAM370_07(:,5)*10-5,LAM370_07(:,4)*10-8, 'r')
hold on
plot(LAM370_08(:,5)*10-5,LAM370_08(:,4)*10-8, 'g')
hold on
plot(LAM370_09(:,5)*10-5,LAM370_09(:,4)*10-8, 'k')
hold on
plot(LAM370_10(:,5)*10-5,LAM370_10(:,4)*10-8, 'm')
hold on
grid on
legend('LAM370\_06', 'LAM370\_07', 'LAM370\_08',
        'LAM370\_09', 'LAM370\_10', 'Location', 'Best')
xlabel('Displacement  $\Delta$  [mm]')
ylabel('Load  $P$  [kN]')

f3=figure(3);
plot(LAM370_11(:,5)*10-5,LAM370_11(:,4)*10-8, 'b')
hold on
plot(LAM370_12(:,5)*10-5,LAM370_12(:,4)*10-8, 'r')
hold on
plot(LAM371_01(:,5)*10-5,LAM371_01(:,4)*10-8, 'g')
hold on
plot(LAM371_02(:,5)*10-5,LAM371_02(:,4)*10-8, 'k')
hold on
plot(LAM371_03(:,5)*10-5,LAM371_03(:,4)*10-8, 'm')
hold on
plot(LAM376_11(:,5)*10-5,LAM376_11(:,4)*10-8, 'c')
hold on
grid on
legend('LAM370\_11', 'LAM370\_12', 'LAM371\_01', 'LAM371\_02',
        'LAM371\_03', 'LAM376\_11', 'Location', 'Best')
xlabel('Displacement  $\Delta$  [mm]')

```

```
ylabel('Load_P [kN]')

f4=figure(4);
plot(LAM371_04(:,5)*10^-5,LAM371_04(:,4)*10^-8,'b')
hold on
plot(LAM371_05(:,5)*10^-5,LAM371_05(:,4)*10^-8,'r')
hold on
plot(LAM371_06(:,5)*10^-5,LAM371_06(:,4)*10^-8,'g')
hold on
plot(LAM371_07(:,5)*10^-5,LAM371_07(:,4)*10^-8,'k')
hold on
plot(LAM371_08(:,5)*10^-5,LAM371_08(:,4)*10^-8,'m')
hold on
grid on
legend('LAM371\_04','LAM371\_05','LAM371\_06',
       'LAM371\_07','LAM371\_08','Location','Best')
xlabel('Displacement_\delta [mm]')
ylabel('Load_P [kN]')

f5=figure(5);
plot(LAM370_01(:,5)*10^-5,LAM370_01(:,4)*10^-8,'b')
hold on
plot(LAM371_09(:,5)*10^-5,LAM371_09(:,4)*10^-8,'r')
hold on
plot(LAM377_11(:,5)*10^-5,LAM377_11(:,4)*10^-8,'g')
hold on
grid on
legend('Standard_position','Position_1','Position_2',
       'Location','Best')
xlabel('Displacement_\delta [mm]')
ylabel('Load_P [kN]')

f6=figure(6);
plot(LAM370_06(:,5)*10^-5,LAM370_06(:,4)*10^-8,'b')
hold on
plot(LAM371_10(:,5)*10^-5,LAM371_10(:,4)*10^-8,'r')
hold on
grid on
legend('Standard_position','Position_1','Location','Best')
xlabel('Displacement_\delta [mm]')
ylabel('Load_P [kN]')

f7=figure(7);
plot(LAM376_01_01(:,5)*10^-5,LAM376_01_01(:,4)*10^-8,'b')
```

```

hold on
plot(LAM376_01_02(:,5)*10-5,LAM376_01_02(:,4)*10-8, 'r')
hold on
grid on
legend('Teflon_insert', 'a_{0}=70 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f8=figure(8);
plot(LAM376_02_01(:,5)*10-5,LAM376_02_01(:,4)*10-8, 'b')
hold on
plot(LAM376_02_02(:,5)*10-5,LAM376_02_02(:,4)*10-8, 'r')
hold on
plot(LAM376_02_03(:,5)*10-5,LAM376_02_03(:,4)*10-8, 'g')
hold on
plot(LAM376_02_04(:,5)*10-5,LAM376_02_04(:,4)*10-8, 'k')
hold on
grid on
legend('Teflon_insert', 'a_{0}=65 [mm]', 'a_{0}=100 [mm]',
       'a_{0}=160 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f9=figure(9);
plot(LAM376_03_01(:,5)*10-5,LAM376_03_01(:,4)*10-8, 'b')
hold on
plot(LAM376_03_02(:,5)*10-5,LAM376_03_02(:,4)*10-8, 'r')
hold on
plot(LAM376_03_03(:,5)*10-5,LAM376_03_03(:,4)*10-8, 'g')
hold on
grid on
legend('Teflon_insert', 'a_{0}=65 [mm]', 'a_{0}=100 [mm]',
       'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f10=figure(10);
plot(LAM376_04_01(:,5)*10-5,LAM376_04_01(:,4)*10-8, 'b')
hold on
plot(LAM376_04_02(:,5)*10-5,LAM376_04_02(:,4)*10-8, 'r')
hold on
plot(LAM376_04_03(:,5)*10-5,LAM376_04_03(:,4)*10-8, 'g')
hold on
plot(LAM376_04_04(:,5)*10-5,LAM376_04_04(:,4)*10-8, 'k')

```

```
hold on
grid on
legend('Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=110 [mm]',
       'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f11=figure(11);
plot(LAM376_05_01(:,5)*10^-5, LAM376_05_01(:,4)*10^-8, 'b')
hold on
plot(LAM376_05_02(:,5)*10^-5, LAM376_05_02(:,4)*10^-8, 'r')
hold on
plot(LAM376_05_03(:,5)*10^-5, LAM376_05_03(:,4)*10^-8, 'g')
hold on
grid on
legend('Teflon_insert', 'a_{0}=75 [mm]', 'a_{0}=125 [mm]',
       'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f12=figure(12);
plot(LAM376_06_01(:,5)*10^-5, LAM376_06_01(:,4)*10^-8, 'b')
hold on
plot(LAM376_06_02(:,5)*10^-5, LAM376_06_02(:,4)*10^-8, 'r')
hold on
plot(LAM376_06_03(:,5)*10^-5, LAM376_06_03(:,4)*10^-8, 'g')
hold on
plot(LAM376_06_04(:,5)*10^-5, LAM376_06_04(:,4)*10^-8, 'k')
hold on
grid on
legend('Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=105 [mm]',
       'a_{0}=145 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f13=figure(13);
plot(LAM376_07_01(:,5)*10^-5, LAM376_07_01(:,4)*10^-8, 'b')
hold on
plot(LAM376_07_02(:,5)*10^-5, LAM376_07_02(:,4)*10^-8, 'r')
hold on
plot(LAM376_07_03(:,5)*10^-5, LAM376_07_03(:,4)*10^-8, 'g')
hold on
plot(LAM376_07_04(:,5)*10^-5, LAM376_07_04(:,4)*10^-8, 'k')
hold on
```



```

grid on
legend( 'Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=110 [mm]',
          'a_{0}=155 [mm]', 'Location', 'Best')
xlabel( 'Displacement \delta [mm]')
ylabel( 'Load P [kN]')

f14=figure (14);
plot(LAM376_08_01(:,5)*10-5, LAM376_08_01(:,4)*10-8, 'b')
hold on
plot(LAM376_08_02(:,5)*10-5, LAM376_08_02(:,4)*10-8, 'r')
hold on
plot(LAM376_08_03(:,5)*10-5, LAM376_08_03(:,4)*10-8, 'g')
hold on
plot(LAM376_08_04(:,5)*10-5, LAM376_08_04(:,4)*10-8, 'k')
hold on
grid on
legend( 'Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=105 [mm]',
          'a_{0}=140 [mm]', 'Location', 'Best')
xlabel( 'Displacement \delta [mm]')
ylabel( 'Load P [kN]')

f15=figure (15);
plot(LAM376_09_01(:,5)*10-5, LAM376_09_01(:,4)*10-8, 'b')
hold on
plot(LAM376_09_02(:,5)*10-5, LAM376_09_02(:,4)*10-8, 'r')
hold on
plot(LAM376_09_03(:,5)*10-5, LAM376_09_03(:,4)*10-8, 'g')
hold on
plot(LAM376_09_04(:,5)*10-5, LAM376_09_04(:,4)*10-8, 'k')
hold on
grid on
legend( 'Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=115 [mm]',
          'a_{0}=155 [mm]', 'Location', 'Best')
xlabel( 'Displacement \delta [mm]')
ylabel( 'Load P [kN]')

f16=figure (16);
plot(LAM376_10_01(:,5)*10-5, LAM376_10_01(:,4)*10-8, 'b')
hold on
plot(LAM376_10_02(:,5)*10-5, LAM376_10_02(:,4)*10-8, 'r')
hold on
plot(LAM376_10_03(:,5)*10-5, LAM376_10_03(:,4)*10-8, 'g')
hold on
plot(LAM376_10_04(:,5)*10-5, LAM376_10_04(:,4)*10-8, 'k')

```

```
hold on
grid on
legend('Teflon_insert', 'a_{0}=65 [mm]', 'a_{0}=100 [mm]',
       'a_{0}=160 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f17=figure(17);
plot(LAM376_12_01(:,5)*10^-5, LAM376_12_01(:,4)*10^-8, 'b')
hold on
plot(LAM376_12_02(:,5)*10^-5, LAM376_12_02(:,4)*10^-8, 'r')
hold on
plot(LAM376_12_03(:,5)*10^-5, LAM376_12_03(:,4)*10^-8, 'g')
hold on
plot(LAM376_12_04(:,5)*10^-5, LAM376_12_04(:,4)*10^-8, 'k')
hold on
grid on
legend('Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=110 [mm]',
       'a_{0}=160 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f18=figure(18);
plot(LAM377_01_01(:,5)*10^-5, LAM377_01_01(:,4)*10^-8, 'b')
hold on
plot(LAM377_01_02(:,5)*10^-5, LAM377_01_02(:,4)*10^-8, 'r')
hold on
plot(LAM377_01_03(:,5)*10^-5, LAM377_01_03(:,4)*10^-8, 'g')
hold on
plot(LAM377_01_04(:,5)*10^-5, LAM377_01_04(:,4)*10^-8, 'k')
hold on
grid on
legend('Teflon_insert', 'a_{0}=60 [mm]', 'a_{0}=100 [mm]',
       'a_{0}=150 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

f19=figure(19);
plot(LAM377_02_01(:,5)*10^-5, LAM377_02_01(:,4)*10^-8, 'b')
hold on
plot(LAM377_02_02(:,5)*10^-5, LAM377_02_02(:,4)*10^-8, 'r')
hold on
plot(LAM377_02_03(:,5)*10^-5, LAM377_02_03(:,4)*10^-8, 'g')
hold on
```

```
grid on
legend( 'Teflon_insert', 'a_{0}=70 [mm]',
        'a_{0}=120 [mm]', 'Location', 'Best')
xlabel( 'Displacement \delta [mm]' )
ylabel( 'Load P [kN]' )

f20=figure (20);
plot(LAM377_03_01(:,5)*10^-5, LAM377_03_01(:,4)*10^-8, 'b')
hold on
plot(LAM377_03_02(:,5)*10^-5, LAM377_03_02(:,4)*10^-8, 'r')
hold on
plot(LAM377_03_03(:,5)*10^-5, LAM377_03_03(:,4)*10^-8, 'g')
hold on
plot(LAM377_03_04(:,5)*10^-5, LAM377_03_04(:,4)*10^-8, 'k')
hold on
grid on
legend( 'Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=110 [mm]',
        'a_{0}=150 [mm]', 'Location', 'Best')
xlabel( 'Displacement \delta [mm]' )
ylabel( 'Load P [kN]' )

f21=figure (21);
plot(LAM377_04_01(:,5)*10^-5, LAM377_04_01(:,4)*10^-8, 'b')
hold on
plot(LAM377_04_02(:,5)*10^-5, LAM377_04_02(:,4)*10^-8, 'r')
hold on
plot(LAM377_04_03(:,5)*10^-5, LAM377_04_03(:,4)*10^-8, 'g')
hold on
grid on
legend( 'Teflon_insert', 'a_{0}=75 [mm]', 'a_{0}=125 [mm]',
        'Location', 'Best')
xlabel( 'Displacement \delta [mm]' )
ylabel( 'Load P [kN]' )

f22=figure (22);
plot(LAM377_05_01(:,5)*10^-5, LAM377_05_01(:,4)*10^-8, 'b')
hold on
plot(LAM377_05_02(:,5)*10^-5, LAM377_05_02(:,4)*10^-8, 'r')
hold on
grid on
legend( 'Teflon_insert', 'a_{0}=65 [mm]', 'a_{0}=100 [mm]',
        'Location', 'Best')
xlabel( 'Displacement \delta [mm]' )
ylabel( 'Load P [kN]' )
```

```
f23=figure(23);
plot(LAM377_06_01(:,5)*10^-5,LAM377_06_01(:,4)*10^-8,'b')
hold on
plot(LAM377_06_02(:,5)*10^-5,LAM377_06_02(:,4)*10^-8,'r')
hold on
plot(LAM377_06_03(:,5)*10^-5,LAM377_06_03(:,4)*10^-8,'g')
hold on
plot(LAM377_06_04(:,5)*10^-5,LAM377_06_04(:,4)*10^-8,'k')
hold on
grid on
legend('Teflon_insert','a_{0}=70_[mm]','a_{0}=105_[mm]','a_{0}=150_[mm]','Location','Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[kN]')
```

```
f24=figure(24);
plot(LAM377_07_01(:,5)*10^-5,LAM377_07_01(:,4)*10^-8,'b')
hold on
plot(LAM377_07_02(:,5)*10^-5,LAM377_07_02(:,4)*10^-8,'r')
hold on
plot(LAM377_07_03(:,5)*10^-5,LAM377_07_03(:,4)*10^-8,'g')
hold on
plot(LAM377_07_04(:,5)*10^-5,LAM377_07_04(:,4)*10^-8,'k')
hold on
grid on
legend('Teflon_insert','a_{0}=70_[mm]','a_{0}=105_[mm]','a_{0}=145_[mm]','Location','Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[kN]')
```

```
f25=figure(25);
plot(LAM377_08_01(:,5)*10^-5,LAM377_08_01(:,4)*10^-8,'b')
hold on
plot(LAM377_08_02(:,5)*10^-5,LAM377_08_02(:,4)*10^-8,'r')
hold on
plot(LAM377_08_03(:,5)*10^-5,LAM377_08_03(:,4)*10^-8,'g')
hold on
grid on
legend('Teflon_insert','a_{0}=75_[mm]','a_{0}=125_[mm]','Location','Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[kN]')
```

```
f26=figure (26);
plot (LAM377_09_01(:,5)*10-5,LAM377_09_01(:,4)*10-8, 'b')
hold on
plot (LAM377_09_02(:,5)*10-5,LAM377_09_02(:,4)*10-8, 'r')
hold on
plot (LAM377_09_03(:,5)*10-5,LAM377_09_03(:,4)*10-8, 'g')
hold on
grid on
legend('Teflon_insert', 'a_{0}=75 [mm]', 'a_{0}=130 [mm]',
       'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')
```

```
f27=figure (27);
plot (LAM377_10_01(:,5)*10-5,LAM377_10_01(:,4)*10-8, 'b')
hold on
plot (LAM377_10_02(:,5)*10-5,LAM377_10_02(:,4)*10-8, 'r')
hold on
plot (LAM377_10_03(:,5)*10-5,LAM377_10_03(:,4)*10-8, 'g')
hold on
plot (LAM377_10_04(:,5)*10-5,LAM377_10_04(:,4)*10-8, 'k')
hold on
grid on
legend('Teflon_insert', 'a_{0}=70 [mm]', 'a_{0}=115 [mm]',
       'a_{0}=155 [mm]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')
```

```
f28=figure (28);
plot (LAM370_01(:,5)*10-5,LAM370_01(:,4)*10-8, 'b')
hold on
plot (LAM370_06(:,5)*10-5,LAM370_06(:,4)*10-8, 'r')
hold on
plot (LAM370_11(:,5)*10-5,LAM370_11(:,4)*10-8, 'g')
hold on
plot (LAM371_04(:,5)*10-5,LAM371_04(:,4)*10-8, 'k')
hold on
plot (LAM370_02(:,5)*10-5,LAM370_02(:,4)*10-8, 'b')
hold on
plot (LAM370_03(:,5)*10-5,LAM370_03(:,4)*10-8, 'b')
hold on
plot (LAM370_04(:,5)*10-5,LAM370_04(:,4)*10-8, 'b')
hold on
```

```
plot(LAM370_05(:,5)*10^-5,LAM370_05(:,4)*10^-8,'b')
hold on
plot(LAM370_07(:,5)*10^-5,LAM370_07(:,4)*10^-8,'r')
hold on
plot(LAM370_08(:,5)*10^-5,LAM370_08(:,4)*10^-8,'r')
hold on
plot(LAM370_09(:,5)*10^-5,LAM370_09(:,4)*10^-8,'r')
hold on
plot(LAM370_10(:,5)*10^-5,LAM370_10(:,4)*10^-8,'r')
hold on
plot(LAM370_12(:,5)*10^-5,LAM370_12(:,4)*10^-8,'g')
hold on
plot(LAM371_01(:,5)*10^-5,LAM371_01(:,4)*10^-8,'g')
hold on
plot(LAM371_02(:,5)*10^-5,LAM371_02(:,4)*10^-8,'g')
hold on
plot(LAM371_03(:,5)*10^-5,LAM371_03(:,4)*10^-8,'g')
hold on
plot(LAM376_11(:,5)*10^-5,LAM376_11(:,4)*10^-8,'g')
hold on
plot(LAM371_05(:,5)*10^-5,LAM371_05(:,4)*10^-8,'k')
hold on
plot(LAM371_06(:,5)*10^-5,LAM371_06(:,4)*10^-8,'k')
hold on
plot(LAM371_07(:,5)*10^-5,LAM371_07(:,4)*10^-8,'k')
hold on
plot(LAM371_08(:,5)*10^-5,LAM371_08(:,4)*10^-8,'k')
hold on
grid on
legend('1 [mm/min] ','50 [mm/min] ','250 [mm/min] ',
       '500 [mm/min] ','Location ','Best ')
xlabel('Displacement \delta [mm] ')
ylabel('Load P [kN] ')

coeff=0.25;

f29=figure(29);
plot(LAM370_01(1:ceil(coeff*length(LAM370_01)),5)*10^-5,
LAM370_01(1:ceil(coeff*length(LAM370_01)),4)*10^-8,'b')
hold on
plot(LAM370_06(1:ceil(coeff*length(LAM370_06)),5)*10^-5,
LAM370_06(1:ceil(coeff*length(LAM370_06)),4)*10^-8,'r')
hold on
plot(LAM370_11(1:ceil(coeff*length(LAM370_11)),5)*10^-5,
```

```
LAM370_11(1:ceil(coeff*length(LAM370_11)),4)*10-8, 'g')
hold on
plot(LAM371_04(1:ceil(coeff*length(LAM371_04)),5)*10-5,
LAM371_04(1:ceil(coeff*length(LAM371_04)),4)*10-8, 'k')
hold on
plot(LAM370_02(1:ceil(coeff*length(LAM370_02)),5)*10-5,
LAM370_02(1:ceil(coeff*length(LAM370_02)),4)*10-8, 'b')
hold on
plot(LAM370_03(1:ceil(coeff*length(LAM370_03)),5)*10-5,
LAM370_03(1:ceil(coeff*length(LAM370_03)),4)*10-8, 'b')
hold on
plot(LAM370_04(1:ceil(coeff*length(LAM370_04)),5)*10-5,
LAM370_04(1:ceil(coeff*length(LAM370_04)),4)*10-8, 'b')
hold on
plot(LAM370_05(1:ceil(coeff*length(LAM370_05)),5)*10-5,
LAM370_05(1:ceil(coeff*length(LAM370_05)),4)*10-8, 'b')
hold on
plot(LAM370_07(1:ceil(coeff*length(LAM370_07)),5)*10-5,
LAM370_07(1:ceil(coeff*length(LAM370_07)),4)*10-8, 'r')
hold on
plot(LAM370_08(1:ceil(coeff*length(LAM370_08)),5)*10-5,
LAM370_08(1:ceil(coeff*length(LAM370_08)),4)*10-8, 'r')
hold on
plot(LAM370_09(1:ceil(coeff*length(LAM370_09)),5)*10-5,
LAM370_09(1:ceil(coeff*length(LAM370_09)),4)*10-8, 'r')
hold on
plot(LAM370_10(1:ceil(coeff*length(LAM370_10)),5)*10-5,
LAM370_10(1:ceil(coeff*length(LAM370_10)),4)*10-8, 'r')
hold on
plot(LAM370_12(1:ceil(coeff*length(LAM370_12)),5)*10-5,
LAM370_12(1:ceil(coeff*length(LAM370_12)),4)*10-8, 'g')
hold on
plot(LAM371_01(1:ceil(coeff*length(LAM371_01)),5)*10-5,
LAM371_01(1:ceil(coeff*length(LAM371_01)),4)*10-8, 'g')
hold on
plot(LAM371_02(1:ceil(coeff*length(LAM371_02)),5)*10-5,
LAM371_02(1:ceil(coeff*length(LAM371_02)),4)*10-8, 'g')
hold on
plot(LAM371_03(1:ceil(coeff*length(LAM371_03)),5)*10-5,
LAM371_03(1:ceil(coeff*length(LAM371_03)),4)*10-8, 'g')
hold on
plot(LAM376_11(1:ceil(coeff*length(LAM376_11)),5)*10-5,
LAM376_11(1:ceil(coeff*length(LAM376_11)),4)*10-8, 'g')
hold on
```

```

plot(LAM371_05(1:ceil(coeff*length(LAM371_05)),5)*10^-5,
LAM371_05(1:ceil(coeff*length(LAM371_05)),4)*10^-8,'k')
hold on
plot(LAM371_06(1:ceil(coeff*length(LAM371_06)),5)*10^-5,
LAM371_06(1:ceil(coeff*length(LAM371_06)),4)*10^-8,'k')
hold on
plot(LAM371_07(1:ceil(coeff*length(LAM371_07)),5)*10^-5,
LAM371_07(1:ceil(coeff*length(LAM371_07)),4)*10^-8,'k')
hold on
plot(LAM371_08(1:ceil(coeff*length(LAM371_08)),5)*10^-5,
LAM371_08(1:ceil(coeff*length(LAM371_08)),4)*10^-8,'k')
hold on
grid on
legend('1 [mm/min]', '50 [mm/min]', '250 [mm/min]',
'500 [mm/min]', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [kN]')

b=20; %[mm]
a=35; %[mm]
L=100; %[mm]

P_vel1=[sorted_LAM370_01(1,4);sorted_LAM370_02(1,4);
sorted_LAM370_03(1,4);sorted_LAM370_04(1,4);
sorted_LAM370_05(1,4)]*10^-5; %[N]
P_vel50=[sorted_LAM370_06(1,4);sorted_LAM370_07(1,4);
sorted_LAM370_08(1,4);sorted_LAM370_09(1,4);
sorted_LAM370_10(1,4)]*10^-5; %[N]
P_vel250=[sorted_LAM370_11(1,4);sorted_LAM370_12(1,4);
sorted_LAM371_01(1,4);sorted_LAM371_02(1,4);
sorted_LAM371_03(1,4)]*10^-5; %[N]
P_vel500=[sorted_LAM371_04(1,4);sorted_LAM371_05(1,4);
sorted_LAM371_06(1,4);sorted_LAM371_07(1,4);
sorted_LAM371_08(1,4)]*10^-5; %[N]

delta_vel1=[sorted_LAM370_01(1,5);sorted_LAM370_02(1,5);
sorted_LAM370_03(1,5);sorted_LAM370_04(1,5);
sorted_LAM370_05(1,5)]*10^-5; %[mm]
delta_vel50=[sorted_LAM370_06(1,5);sorted_LAM370_07(1,5);
sorted_LAM370_08(1,5);sorted_LAM370_09(1,5);
sorted_LAM370_10(1,5)]*10^-5; %[mm]
delta_vel250=[sorted_LAM370_11(1,5);sorted_LAM370_12(1,5);
sorted_LAM371_01(1,5);sorted_LAM371_02(1,5);
sorted_LAM371_03(1,5)]*10^-5; %[mm]

```



```

delta_vel500=[sorted_LAM371_04(1,5);sorted_LAM371_05(1,5);
sorted_LAM371_06(1,5);sorted_LAM371_07(1,5);
sorted_LAM371_08(1,5)]*10^-5;%[mm]

GIIc_vel1=P_vel1.*(delta_vel1-0.4)*(9/2)*(a^2)*1000./
(b*(0.25*(L^3)+3*(a^3)));%[N/m or J/m^2]
GIIc_vel50=P_vel50.*(delta_vel50-0.45)*(9/2)*(a^2)
*1000./(b*(0.25*(L^3)+3*(a^3)));
GIIc_vel250=P_vel250.*(delta_vel250-0.6)*(9/2)*(a^2)
*1000./(b*(0.25*(L^3)+3*(a^3)));
GIIc_vel500=P_vel500.*(delta_vel500-0.75)*(9/2)*(a^2)
*1000./(b*(0.25*(L^3)+3*(a^3)));

spec_num_vel1=length(GIIc_vel1)
spec_num_vel50=length(GIIc_vel50)
spec_num_vel250=length(GIIc_vel250)
spec_num_vel500=length(GIIc_vel500)

mean_GIIc_vel1=mean(GIIc_vel1)%[N/m or J/m^2]
mean_GIIc_vel50=mean(GIIc_vel50)%[N/m or J/m^2]
mean_GIIc_vel250=mean(GIIc_vel250)%[N/m or J/m^2]
mean_GIIc_vel500=mean(GIIc_vel500)%[N/m or J/m^2]

std_GIIc_vel1=std(GIIc_vel1)%[N/m or J/m^2]
std_GIIc_vel50=std(GIIc_vel50)%[N/m or J/m^2]
std_GIIc_vel250=std(GIIc_vel250)%[N/m or J/m^2]
std_GIIc_vel500=std(GIIc_vel500)%[N/m or J/m^2]

std_perc_GIIc_vel1=std_GIIc_vel1/mean_GIIc_vel1
std_perc_GIIc_vel50=std_GIIc_vel50/mean_GIIc_vel50
std_perc_GIIc_vel250=std_GIIc_vel250/mean_GIIc_vel250
std_perc_GIIc_vel500=std_GIIc_vel500/mean_GIIc_vel500

saveas(f1,'exp_modeII_vel1.pdf')
saveas(f2,'exp_modeII_vel50.pdf')
saveas(f3,'exp_modeII_vel250.pdf')
saveas(f4,'exp_modeII_vel500.pdf')
saveas(f5,'exp_modeII_pos1.pdf')
saveas(f6,'exp_modeII_pos2.pdf')
saveas(f7,'exp_modeII_initial_crack1.pdf')
saveas(f8,'exp_modeII_initial_crack2.pdf')
saveas(f9,'exp_modeII_initial_crack3.pdf')
saveas(f10,'exp_modeII_initial_crack4.pdf')
saveas(f11,'exp_modeII_initial_crack5.pdf')

```

```
saveas(f12, 'exp_modeII_initial_crack6.pdf')
saveas(f13, 'exp_modeII_initial_crack7.pdf')
saveas(f14, 'exp_modeII_initial_crack8.pdf')
saveas(f15, 'exp_modeII_initial_crack9.pdf')
saveas(f16, 'exp_modeII_initial_crack10.pdf')
saveas(f17, 'exp_modeII_initial_crack11.pdf')
saveas(f18, 'exp_modeII_initial_crack12.pdf')
saveas(f19, 'exp_modeII_initial_crack13.pdf')
saveas(f20, 'exp_modeII_initial_crack14.pdf')
saveas(f21, 'exp_modeII_initial_crack15.pdf')
saveas(f22, 'exp_modeII_initial_crack16.pdf')
saveas(f23, 'exp_modeII_initial_crack17.pdf')
saveas(f24, 'exp_modeII_initial_crack18.pdf')
saveas(f25, 'exp_modeII_initial_crack19.pdf')
saveas(f26, 'exp_modeII_initial_crack20.pdf')
saveas(f27, 'exp_modeII_initial_crack21.pdf')
saveas(f28, 'exp_modeII_comp_vel.pdf')
saveas(f29, 'exp_modeII_comp_vel_refined.pdf')
```

### *Mixed mode I-II*

```
clear all
close all
clc

LAM372_01=xlsread('LAM372.xls','LAM372-01');
LAM372_02=xlsread('LAM372.xls','LAM372-02');
LAM372_03=xlsread('LAM372.xls','LAM372-03');
LAM372_04=xlsread('LAM372.xls','LAM372-04');
LAM372_05=xlsread('LAM372.xls','LAM372-05');
LAM372_06=xlsread('LAM372.xls','LAM372-06');
LAM372_07=xlsread('LAM372.xls','LAM372-07');
LAM372_08=xlsread('LAM372.xls','LAM372-08');
LAM372_09=xlsread('LAM372.xls','LAM372-09');
LAM372_10=xlsread('LAM372.xls','LAM372-10');

LAM373_01=xlsread('LAM373.xls','LAM373-01');
LAM373_02=xlsread('LAM373.xls','LAM373-02');
LAM373_03=xlsread('LAM373.xls','LAM373-03');
LAM373_04=xlsread('LAM373.xls','LAM373-04');
LAM373_05=xlsread('LAM373.xls','LAM373-05');
LAM373_06=xlsread('LAM373.xls','LAM373-06');
LAM373_07=xlsread('LAM373.xls','LAM373-07');
```

```

LAM373_08=xlsread('LAM373.xls','LAM373-08');
LAM373_09=xlsread('LAM373.xls','LAM373-09');
LAM373_10=xlsread('LAM373.xls','LAM373-10');
LAM373_11=xlsread('LAM373.xls','LAM373-11');
LAM373_12=xlsread('LAM373.xls','LAM373-12');

LAM378_01=xlsread('LAM378.xls','LAM378-01');
LAM378_02=xlsread('LAM378.xls','LAM378-02');
LAM378_03=xlsread('LAM378.xls','LAM378-03');
LAM378_04=xlsread('LAM378.xls','LAM378-04');
LAM378_05=xlsread('LAM378.xls','LAM378-05');
LAM378_06=xlsread('LAM378.xls','LAM378-06');
LAM378_07=xlsread('LAM378.xls','LAM378-07');
LAM378_08=xlsread('LAM378.xls','LAM378-08');
LAM378_09=xlsread('LAM378.xls','LAM378-09');
LAM378_10=xlsread('LAM378.xls','LAM378-10');
LAM378_11=xlsread('LAM378.xls','LAM378-11');
LAM378_12=xlsread('LAM378.xls','LAM378-12');

LAM379_08=xlsread('LAM379.xls','LAM379-08');
LAM379_09=xlsread('LAM379.xls','LAM379-09_part1');
LAM379_10=xlsread('LAM379.xls','LAM379-10');
LAM379_11=xlsread('LAM379.xls','LAM379-11');

f1=figure(1);
plot(-LAM372_01(:,2)*10^-5,-LAM372_01(:,3)*10^-5,'b')
hold on
plot(-LAM372_02(:,2)*10^-5,-LAM372_02(:,3)*10^-5,'r')
hold on
plot(-LAM372_04(:,2)*10^-5,-LAM372_04(:,3)*10^-5,'g')
hold on
plot(-LAM372_05(:,2)*10^-5,-LAM372_05(:,3)*10^-5,'k')
hold on
plot(-LAM379_08(:,2)*10^-5,-LAM379_08(:,3)*10^-5,'m')
hold on
plot(-LAM379_09(:,2)*10^-5,-LAM379_09(:,3)*10^-5,'c')
hold on
grid on
legend('LAM372\_01','LAM372\_02','LAM372\_04','LAM372\_05',
       'LAM379\_08','LAM379\_09','Location','Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[N]')

f2=figure(2);

```

```
plot(-LAM372_09(:,2)*10^-5, -LAM372_09(:,3)*10^-5, 'b')
hold on
plot(-LAM372_10(:,2)*10^-5, -LAM372_10(:,3)*10^-5, 'r')
hold on
plot(-LAM378_09(:,2)*10^-5, -LAM378_09(:,3)*10^-5, 'g')
hold on
plot(-LAM378_10(:,2)*10^-5, -LAM378_10(:,3)*10^-5, 'k')
hold on
plot(-LAM378_11(:,2)*10^-5, -LAM378_11(:,3)*10^-5, 'm')
hold on
plot(-LAM378_12(:,2)*10^-5, -LAM378_12(:,3)*10^-5, 'c')
hold on
grid on
legend('LAM372\_09', 'LAM372\_10', 'LAM378\_09', 'LAM378\_10',
       'LAM378\_11', 'LAM378\_12', 'Location', 'Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[N]')

f3=figure(3);
plot(-LAM378_04(:,2)*10^-5, -LAM378_04(:,3)*10^-5, 'b')
hold on
plot(-LAM373_01(:,2)*10^-5, -LAM373_01(:,3)*10^-5, 'r')
hold on
plot(-LAM373_02(:,2)*10^-5, -LAM373_02(:,3)*10^-5, 'g')
hold on
plot(-LAM373_03(:,2)*10^-5, -LAM373_03(:,3)*10^-5, 'k')
hold on
plot(-LAM373_04(:,2)*10^-5, -LAM373_04(:,3)*10^-5, 'm')
hold on
plot(-LAM373_06(:,2)*10^-5, -LAM373_06(:,3)*10^-5, 'c')
hold on
grid on
legend('LAM378\_04', 'LAM373\_01', 'LAM373\_02', 'LAM373\_03',
       'LAM373\_04', 'LAM373\_06', 'Location', 'Best')
xlabel('Displacement_\delta_[mm]')
ylabel('Load_P_[N]')

f4=figure(4);
plot(-LAM373_07(:,2)*10^-5, -LAM373_07(:,3)*10^-5, 'b')
hold on
plot(-LAM373_08(:,2)*10^-5, -LAM373_08(:,3)*10^-5, 'r')
hold on
plot(-LAM373_09(:,2)*10^-5, -LAM373_09(:,3)*10^-5, 'g')
hold on
```

```

plot(-LAM373_10(:,2)*10-5, -LAM373_10(:,3)*10-5, 'k')
hold on
plot(-LAM373_11(:,2)*10-5, -LAM373_11(:,3)*10-5, 'm')
hold on
plot(-LAM373_12(:,2)*10-5, -LAM373_12(:,3)*10-5, 'c')
hold on
grid on
legend('LAM373\_07', 'LAM373\_08', 'LAM373\_09', 'LAM373\_10',
        'LAM373\_11', 'LAM373\_12', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [N]')

coeff_f5=60;

f5=figure(5);
plot(-LAM379_10(1:end-coeff_f5,2)*10-5,
      -LAM379_10(1:end-coeff_f5,3)*10-5, 'b')
hold on
plot(-LAM379_11(1:end-coeff_f5,2)*10-5,
      -LAM379_11(1:end-coeff_f5,3)*10-5, 'r')
hold on
grid on
legend('LAM379\_10', 'LAM379\_11', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [N]')

f6=figure(6);
plot(LAM372_01(:,2)*10-5, LAM372_01(:,3)*10-8, 'b')
hold on
plot(LAM372_09(:,2)*10-5, LAM372_09(:,3)*10-8, 'r')
hold on
plot(LAM378_04(:,2)*10-5, LAM378_04(:,3)*10-8, 'g')
hold on
plot(LAM373_07(:,2)*10-5, LAM373_07(:,3)*10-8, 'k')
hold on
plot(-LAM372_02(:,2)*10-5, -LAM372_02(:,3)*10-5, 'b')
hold on
plot(-LAM372_04(:,2)*10-5, -LAM372_04(:,3)*10-5, 'b')
hold on
plot(-LAM372_05(:,2)*10-5, -LAM372_05(:,3)*10-5, 'b')
hold on
plot(-LAM379_08(:,2)*10-5, -LAM379_08(:,3)*10-5, 'b')
hold on
plot(-LAM379_09(:,2)*10-5, -LAM379_09(:,3)*10-5, 'b')

```

```
hold on
plot(-LAM372_10(:,2)*10^-5, -LAM372_10(:,3)*10^-5, 'r')
hold on
plot(-LAM378_09(:,2)*10^-5, -LAM378_09(:,3)*10^-5, 'r')
hold on
plot(-LAM378_10(:,2)*10^-5, -LAM378_10(:,3)*10^-5, 'r')
hold on
plot(-LAM378_11(:,2)*10^-5, -LAM378_11(:,3)*10^-5, 'r')
hold on
plot(-LAM378_12(:,2)*10^-5, -LAM378_12(:,3)*10^-5, 'r')
hold on
plot(-LAM373_01(:,2)*10^-5, -LAM373_01(:,3)*10^-5, 'g')
hold on
plot(-LAM373_02(:,2)*10^-5, -LAM373_02(:,3)*10^-5, 'g')
hold on
plot(-LAM373_03(:,2)*10^-5, -LAM373_03(:,3)*10^-5, 'g')
hold on
plot(-LAM373_04(:,2)*10^-5, -LAM373_04(:,3)*10^-5, 'g')
hold on
plot(-LAM373_06(:,2)*10^-5, -LAM373_06(:,3)*10^-5, 'g')
hold on
plot(-LAM373_08(:,2)*10^-5, -LAM373_08(:,3)*10^-5, 'k')
hold on
plot(-LAM373_09(:,2)*10^-5, -LAM373_09(:,3)*10^-5, 'k')
hold on
plot(-LAM373_10(:,2)*10^-5, -LAM373_10(:,3)*10^-5, 'k')
hold on
plot(-LAM373_11(:,2)*10^-5, -LAM373_11(:,3)*10^-5, 'k')
hold on
plot(-LAM373_12(:,2)*10^-5, -LAM373_12(:,3)*10^-5, 'k')
hold on
grid on
legend('1 [mm/min]', '50 [mm/min]', '250 [mm/min]',
       '500 [mm/min]', 'Location', 'Best', 'Location', 'Best')
xlabel('Displacement \delta [mm]')
ylabel('Load P [N]')

coeff=1;
coeff1=0.5;

f7=figure(7);
plot(-LAM372_01(1:ceil(coeff1*length(LAM372_01)),2)*10^-5,
      -LAM372_01(1:ceil(coeff1*length(LAM372_01)),3)*10^-8, 'b')
hold on
```

```
plot(-LAM372_09(1:ceil(coeff*length(LAM372_09)),2)*10^-5,
-LAM372_09(1:ceil(coeff*length(LAM372_09)),3)*10^-8,'r')
hold on
plot(-LAM378_04(1:ceil(coeff*length(LAM378_04)),2)*10^-5,
-LAM378_04(1:ceil(coeff*length(LAM378_04)),3)*10^-8,'g')
hold on
plot(-LAM373_07(1:ceil(coeff*length(LAM373_07)),2)*10^-5,
-LAM373_07(1:ceil(coeff*length(LAM373_07)),3)*10^-8,'k')
hold on
plot(-LAM372_02(1:ceil(coeff1*length(LAM372_02)),2)*10^-5,
-LAM372_02(1:ceil(coeff1*length(LAM372_02)),3)*10^-5,'b')
hold on
plot(-LAM372_04(1:ceil(coeff1*length(LAM372_04)),2)*10^-5,
-LAM372_04(1:ceil(coeff1*length(LAM372_04)),3)*10^-5,'b')
hold on
plot(-LAM372_05(1:ceil(coeff1*length(LAM372_05)),2)*10^-5,
-LAM372_05(1:ceil(coeff1*length(LAM372_05)),3)*10^-5,'b')
hold on
plot(-LAM379_08(1:ceil(coeff1*length(LAM379_08)),2)*10^-5,
-LAM379_08(1:ceil(coeff1*length(LAM379_08)),3)*10^-5,'b')
hold on
plot(-LAM379_09(1:ceil(coeff1*length(LAM379_09)),2)*10^-5,
-LAM379_09(1:ceil(coeff1*length(LAM379_09)),3)*10^-5,'b')
hold on
plot(-LAM372_10(1:ceil(coeff*length(LAM372_10)),2)*10^-5,
-LAM372_10(1:ceil(coeff*length(LAM372_10)),3)*10^-5,'r')
hold on
plot(-LAM378_09(1:ceil(coeff*length(LAM378_09)),2)*10^-5,
-LAM378_09(1:ceil(coeff*length(LAM378_09)),3)*10^-5,'r')
hold on
plot(-LAM378_10(1:ceil(coeff*length(LAM378_10)),2)*10^-5,
-LAM378_10(1:ceil(coeff*length(LAM378_10)),3)*10^-5,'r')
hold on
plot(-LAM378_11(1:ceil(coeff*length(LAM378_11)),2)*10^-5,
-LAM378_11(1:ceil(coeff*length(LAM378_11)),3)*10^-5,'r')
hold on
plot(-LAM378_12(1:ceil(coeff*length(LAM378_12)),2)*10^-5,
-LAM378_12(1:ceil(coeff*length(LAM378_12)),3)*10^-5,'r')
hold on
plot(-LAM373_01(1:ceil(coeff*length(LAM373_01)),2)*10^-5,
-LAM373_01(1:ceil(coeff*length(LAM373_01)),3)*10^-5,'g')
hold on
plot(-LAM373_02(1:ceil(coeff*length(LAM373_02)),2)*10^-5,
-LAM373_02(1:ceil(coeff*length(LAM373_02)),3)*10^-5,'g')
```

```
hold on
plot(-LAM373_03(1:ceil(coeff*length(LAM373_03)),2)*10^-5,
-LAM373_03(1:ceil(coeff*length(LAM373_03)),3)*10^-5,'g')
hold on
plot(-LAM373_04(1:ceil(coeff*length(LAM373_04)),2)*10^-5,
-LAM373_04(1:ceil(coeff*length(LAM373_04)),3)*10^-5,'g')
hold on
plot(-LAM373_06(1:ceil(coeff*length(LAM373_06)),2)*10^-5,
-LAM373_06(1:ceil(coeff*length(LAM373_06)),3)*10^-5,'g')
hold on
plot(-LAM373_08(1:ceil(coeff*length(LAM373_08)),2)*10^-5,
-LAM373_08(1:ceil(coeff*length(LAM373_08)),3)*10^-5,'k')
hold on
plot(-LAM373_09(1:ceil(coeff*length(LAM373_09)),2)*10^-5,
-LAM373_09(1:ceil(coeff*length(LAM373_09)),3)*10^-5,'k')
hold on
plot(-LAM373_10(1:ceil(coeff*length(LAM373_10)),2)*10^-5,
-LAM373_10(1:ceil(coeff*length(LAM373_10)),3)*10^-5,'k')
hold on
plot(-LAM373_11(1:ceil(coeff*length(LAM373_11)),2)*10^-5,
-LAM373_11(1:ceil(coeff*length(LAM373_11)),3)*10^-5,'k')
hold on
plot(-LAM373_12(1:ceil(coeff*length(LAM373_12)),2)*10^-5,
-LAM373_12(1:ceil(coeff*length(LAM373_12)),3)*10^-5,'k')
hold on
grid on
legend('1 [mm/min]', '50 [mm/min]', '250 [mm/min]',
'500 [mm/min]', 'Location', 'Best')
xlabel('Displacement_\delta [mm]')
ylabel('Load_P [N]')

saveas(f1, 'exp_mixedmode_vel1.pdf')
saveas(f2, 'exp_mixedmode_vel50.pdf')
saveas(f3, 'exp_mixedmode_vel250.pdf')
saveas(f4, 'exp_mixedmode_vel500.pdf')
saveas(f5, 'exp_mixedmode_precrack.pdf')
saveas(f6, 'exp_mixedmode_comp_vel.pdf')
saveas(f7, 'exp_mixedmode_comp_vel_refined.pdf')
```