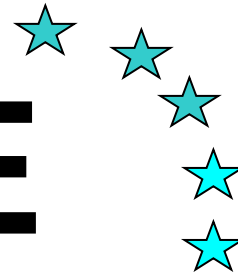


GRISPE



Guidelines and Recommendations for Integrating Specific Profiled steel sheets in the Eurocodes (GRISPE)

Test report

Assembled profiles

Annex

**31.05.2015
(Rev. 01)**

Deliverable D 2.3

Guidelines and Recommendations for Integrating Specific Profiled Steels sheets in the Euro-codes (GRISPE)

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1 Annex A: Object of testing

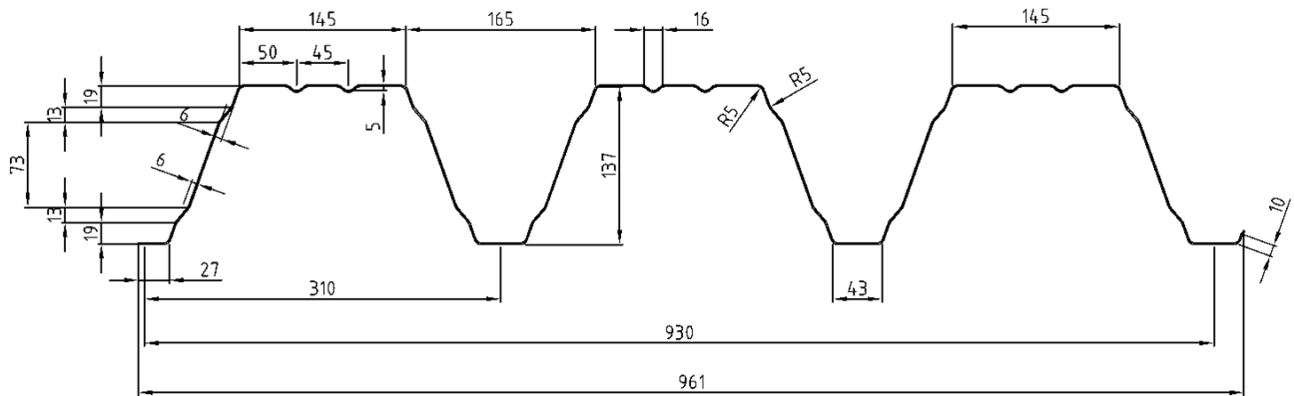


Figure A.1: Cross-section of Joris Ide JI D_137-310-930

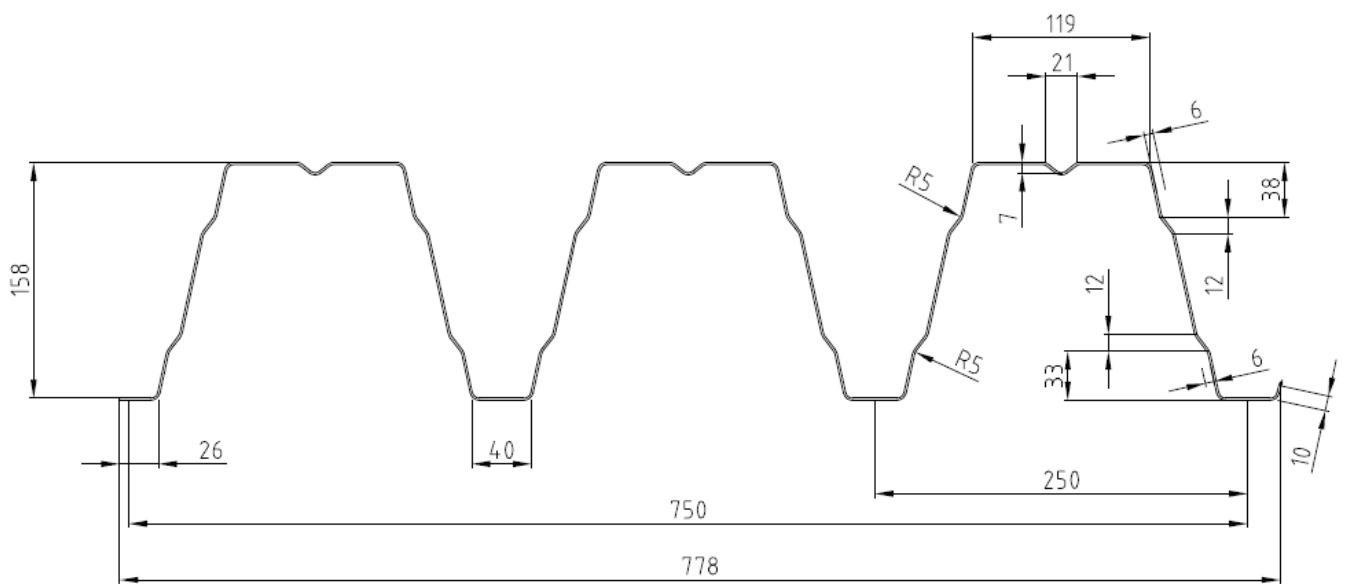
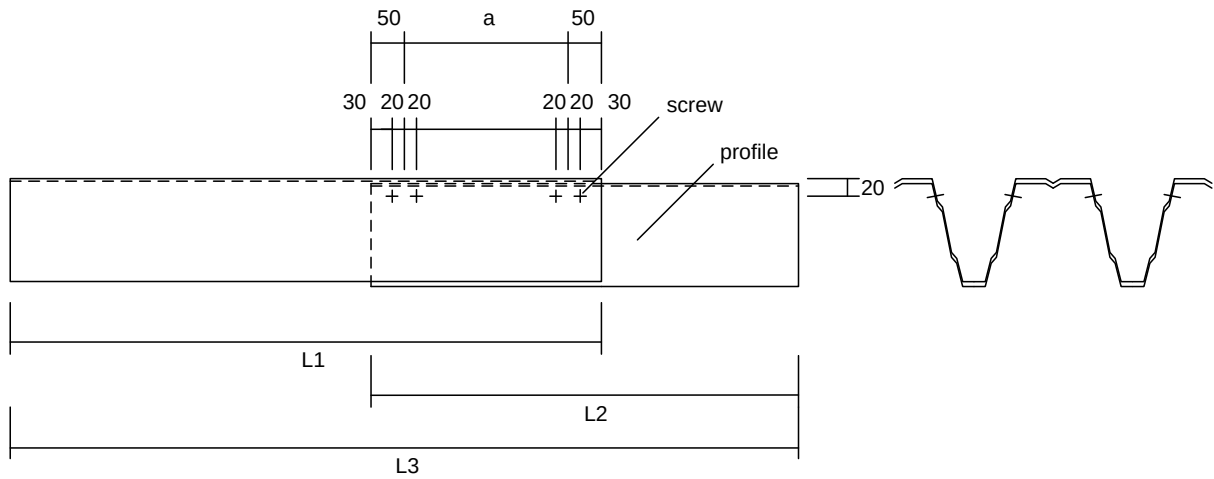
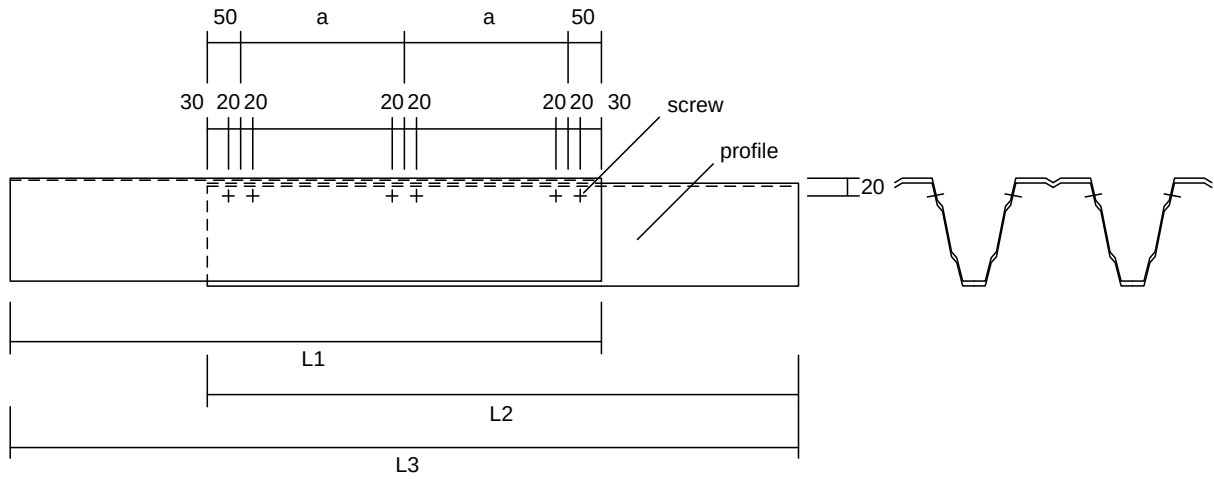


Figure A.2: Cross-section of Joris Ide JI D_158-250-750

Type DIN:



Type OL:



Type CR:

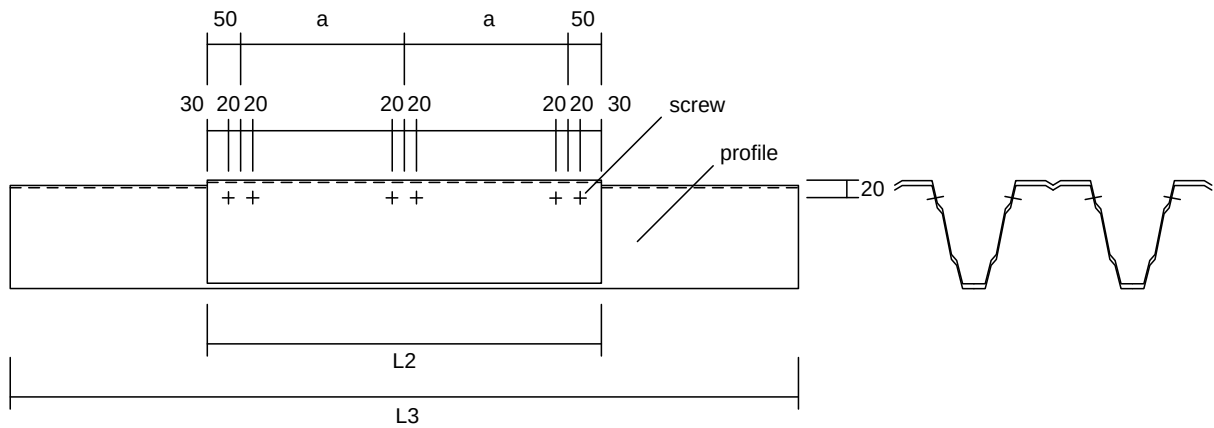


Figure A.3: Description of the different types of the assemblies

2 Annex B: Internal support test for load case “gravity loading”

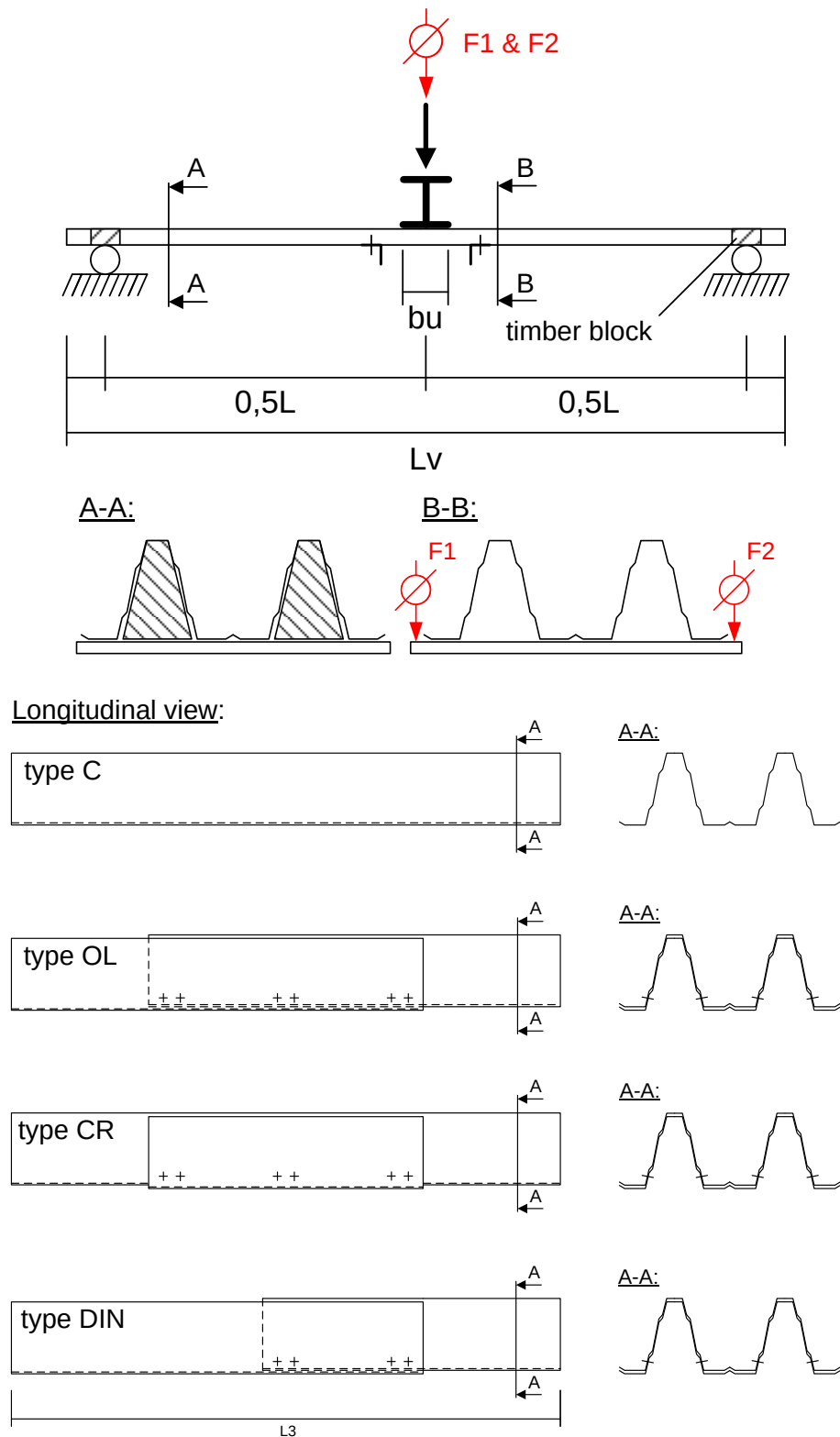


Figure B.1: Schematic test setup

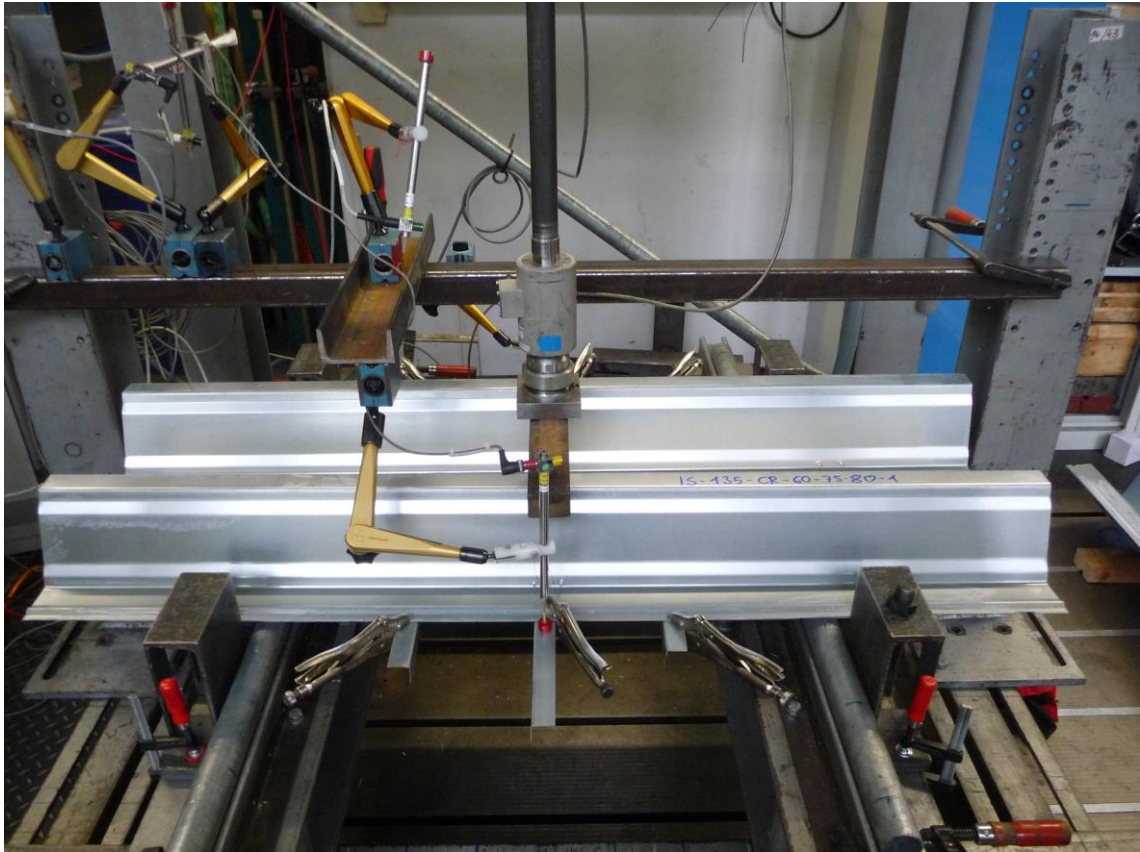


Figure B.2: Test setup (exemplary for $b_u = 60\text{mm}$; span = 800mm)

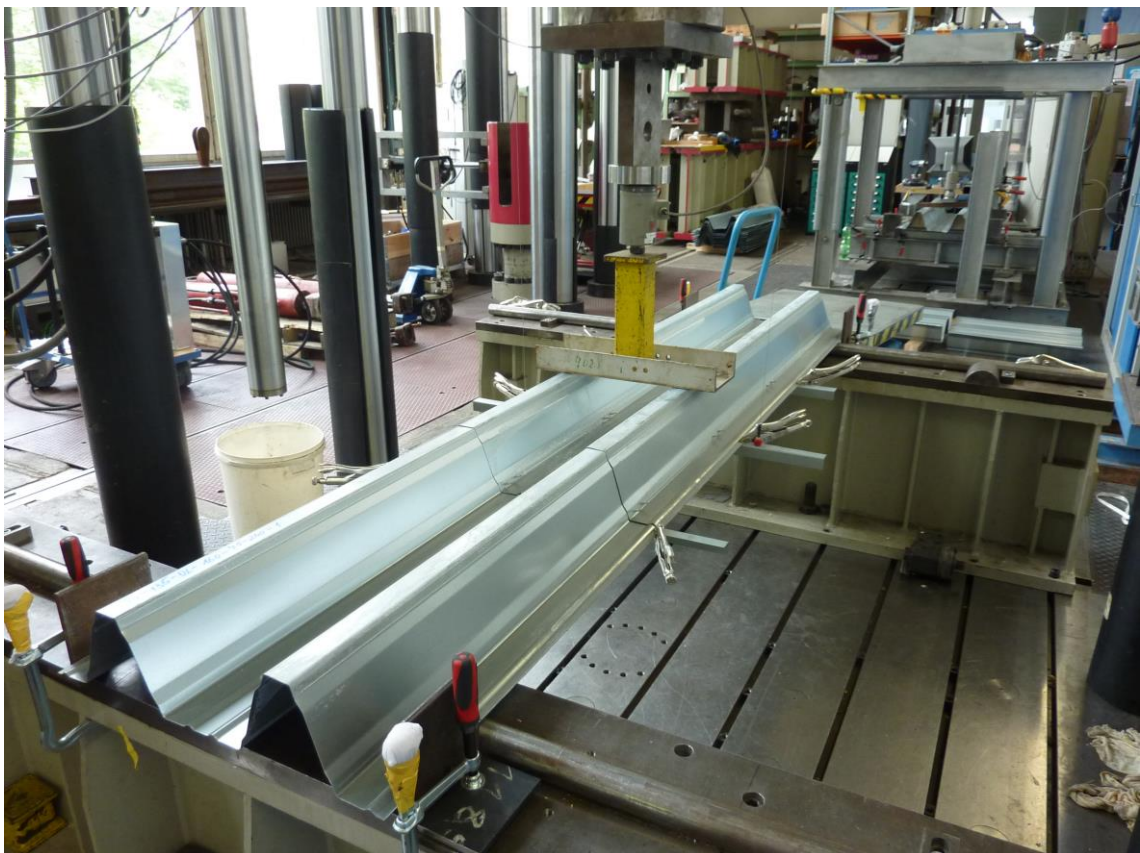


Figure B.3: Test setup (exemplary for $b_u = 160\text{mm}$; span = 2400mm)

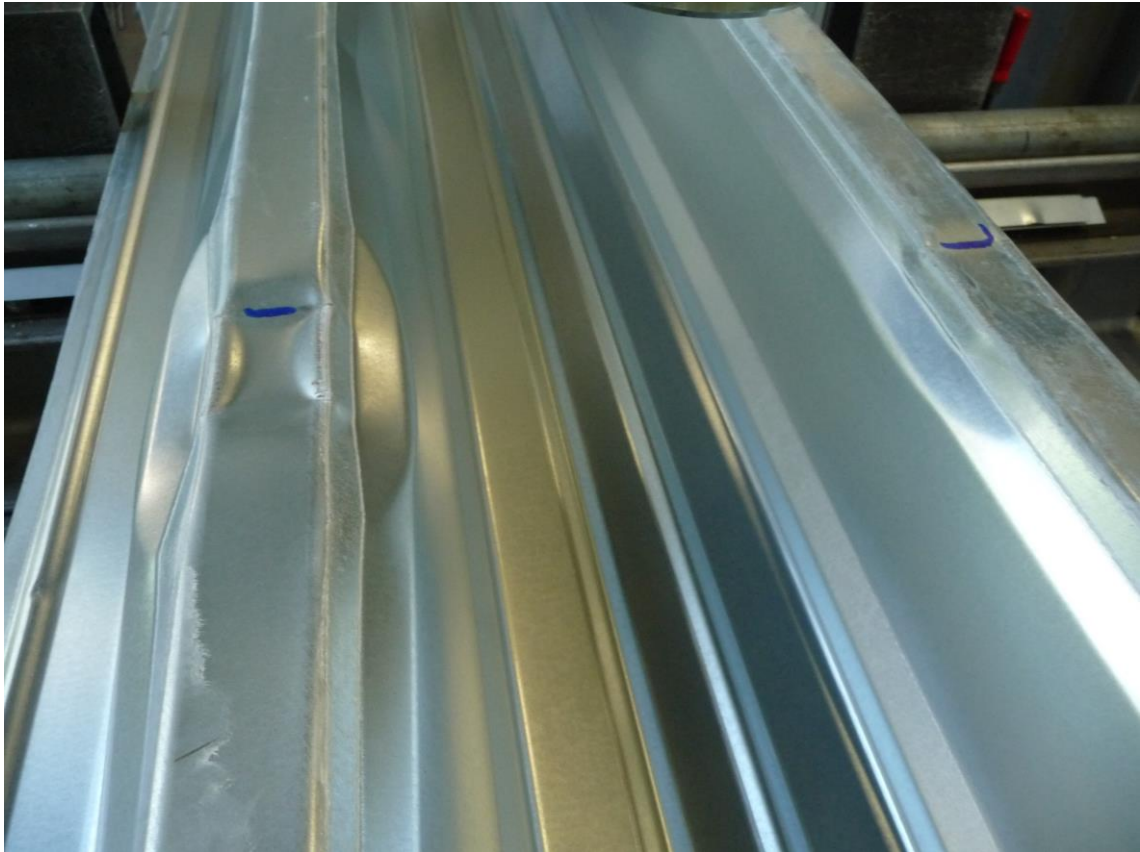


Figure B.4: Failure mode (exemplary IS-135-C-60-75-80-2)



Figure B.5: Failure mode (exemplary IS-135-C-60-75-280-2)



Figure B.6: Failure mode (exemplary IS-135-C-160-75-80-1)

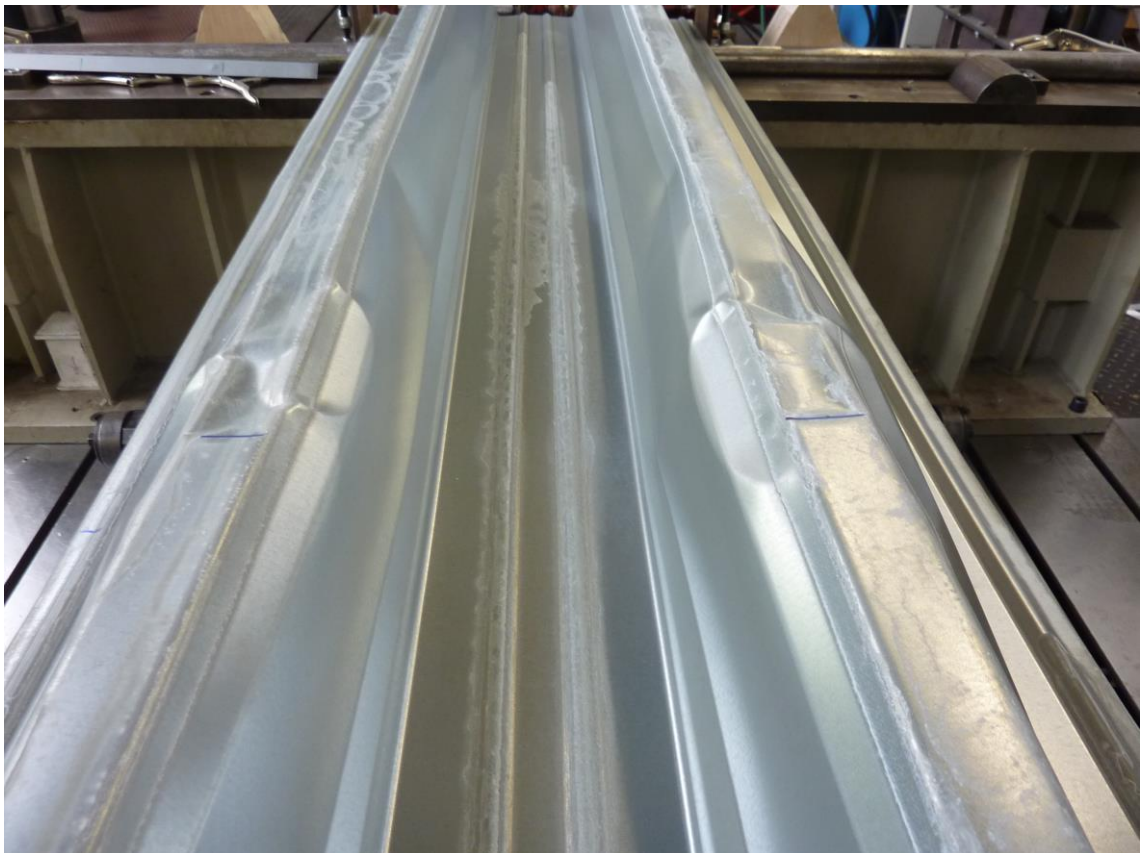


Figure B.7: Failure mode (exemplary IS-135-C-160-75-240-2)

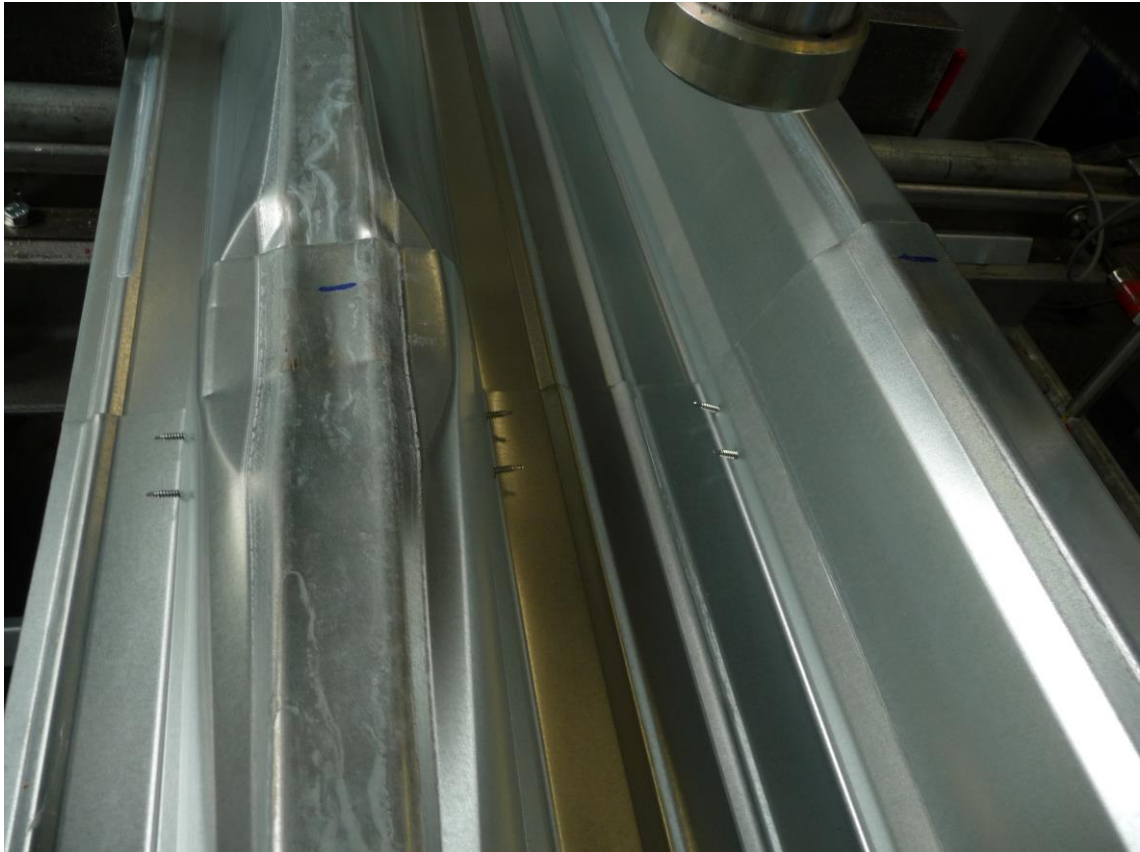


Figure B.8: Failure mode (exemplary IS-135-DIN-60-75-80-1)

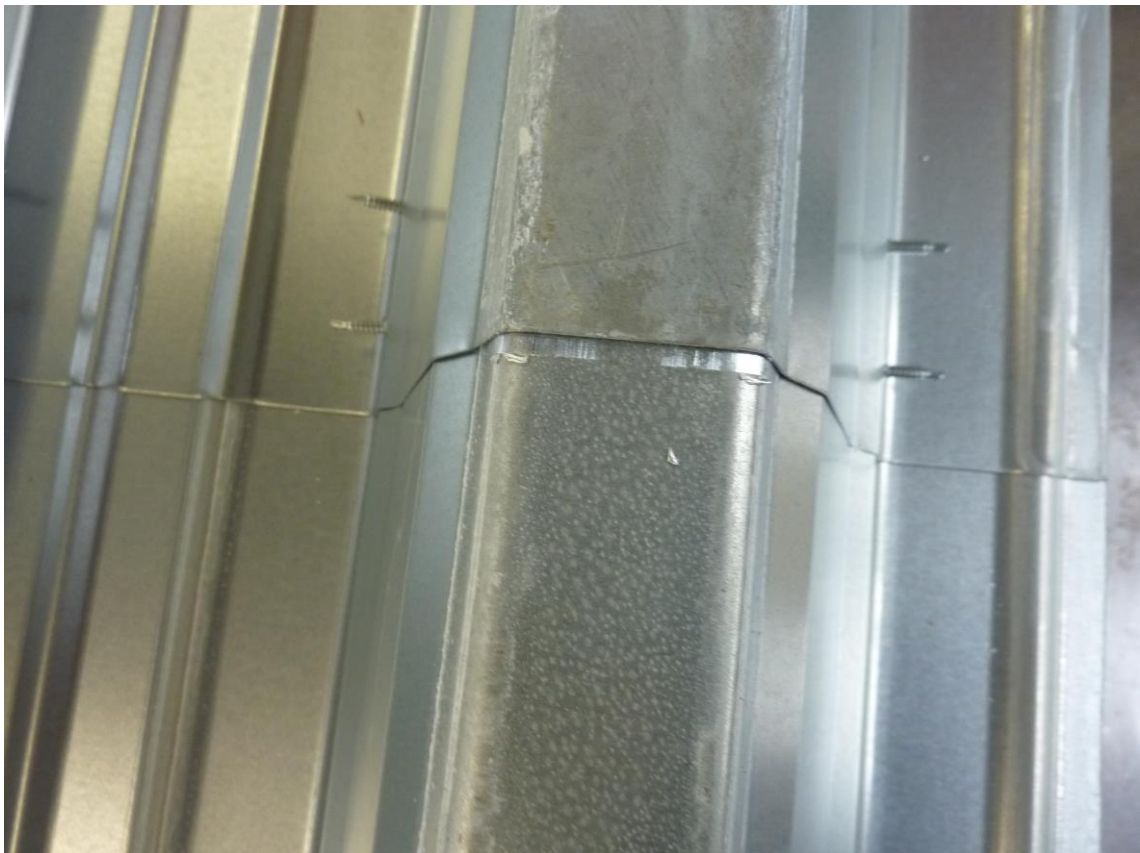


Figure B.9: Failure mode (exemplary IS-135-DIN-60-75-240-1)

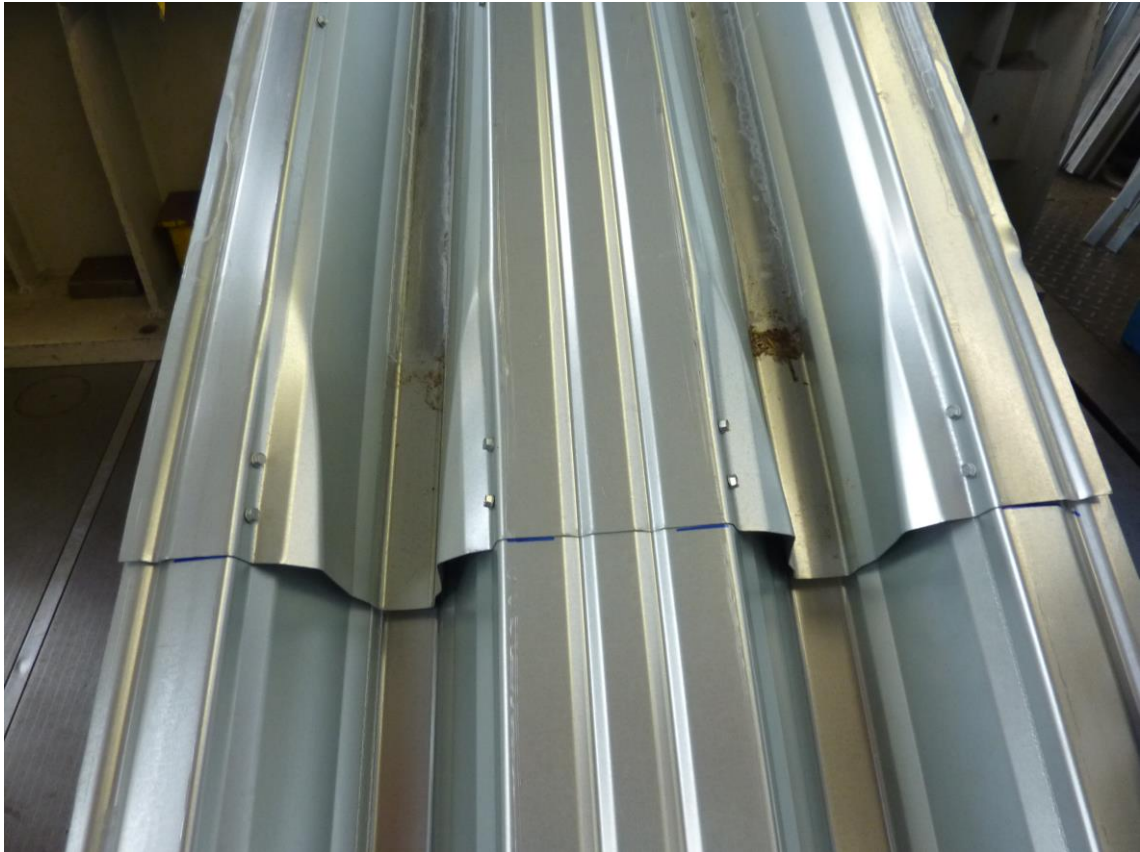


Figure B.10: Failure mode (exemplary IS-135-DIN-60-75-240-1)

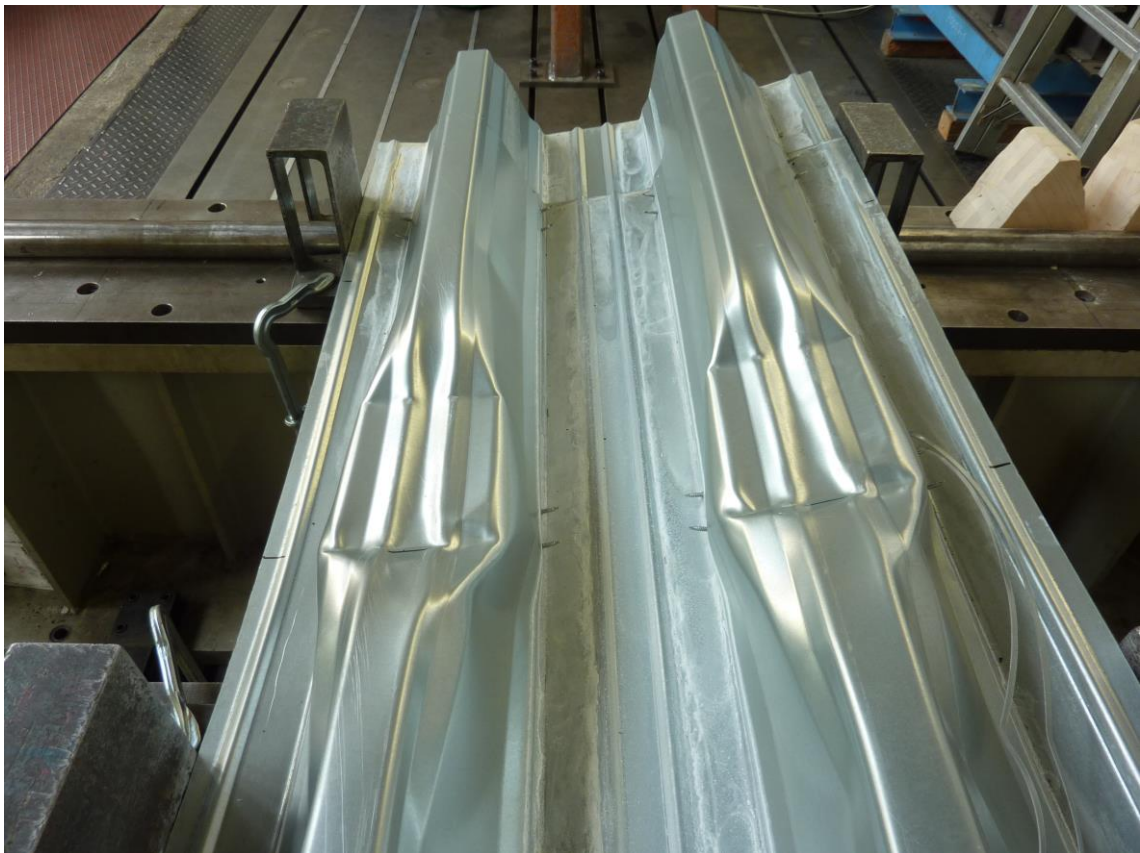


Figure B.11: Failure mode (exemplary IS-135-DIN-160-100-80-1)



Figure B.12: Failure mode (exemplary IS-135-DIN-160-75-240-1)

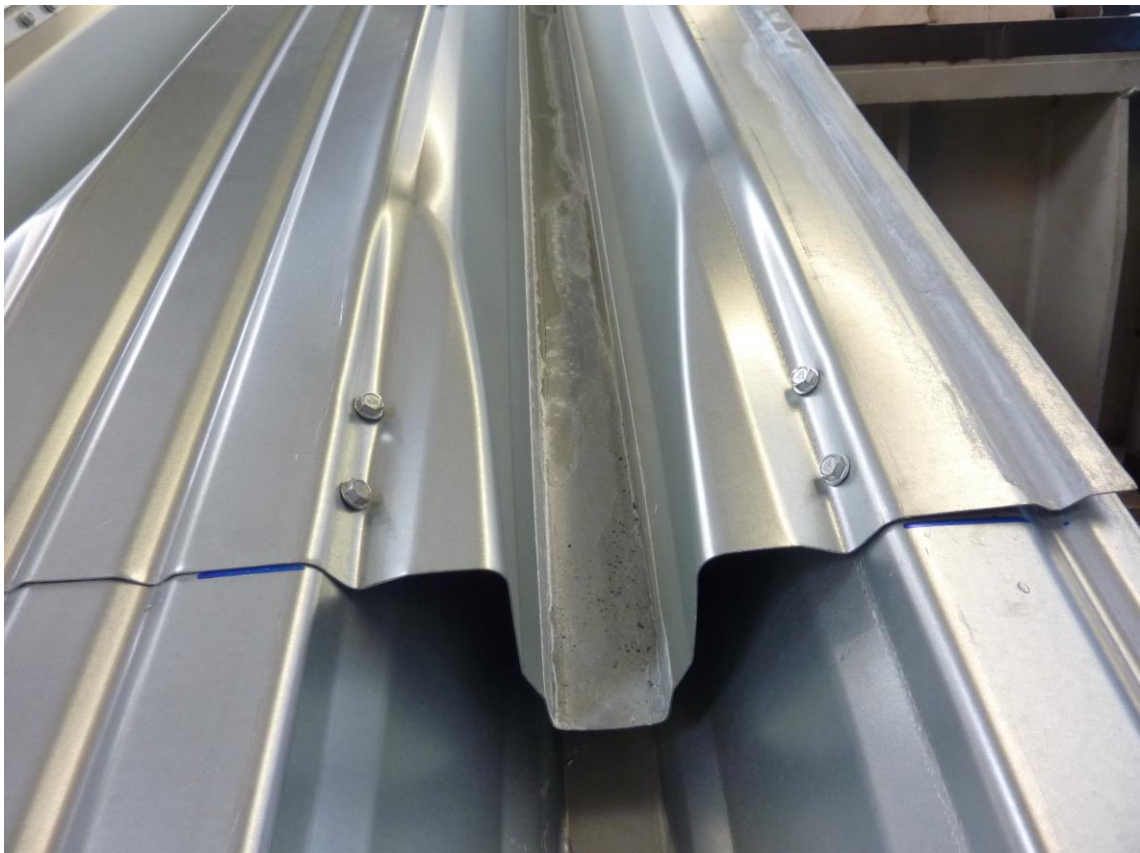


Figure B.13: Failure mode (exemplary IS-135-DIN-160-75-240-1)

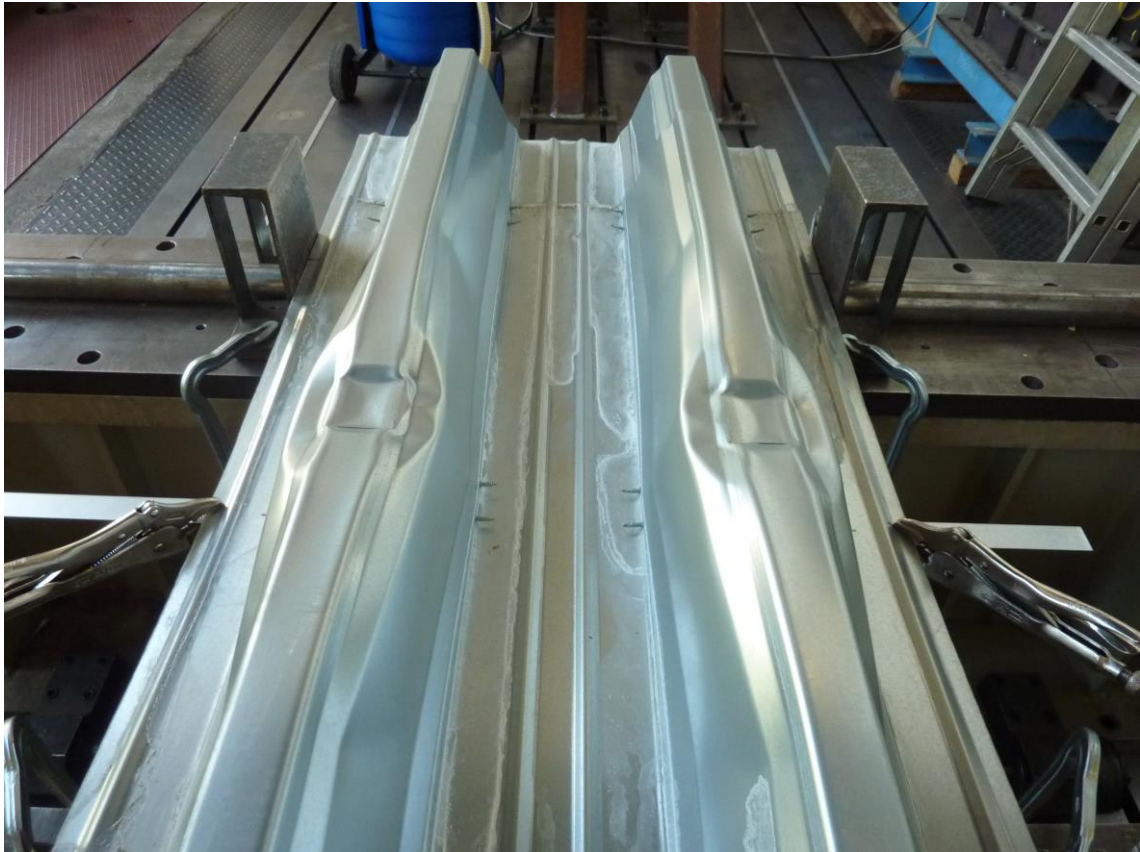


Figure B.14: Failure mode (exemplary IS-135-OL-60-100-80-2)

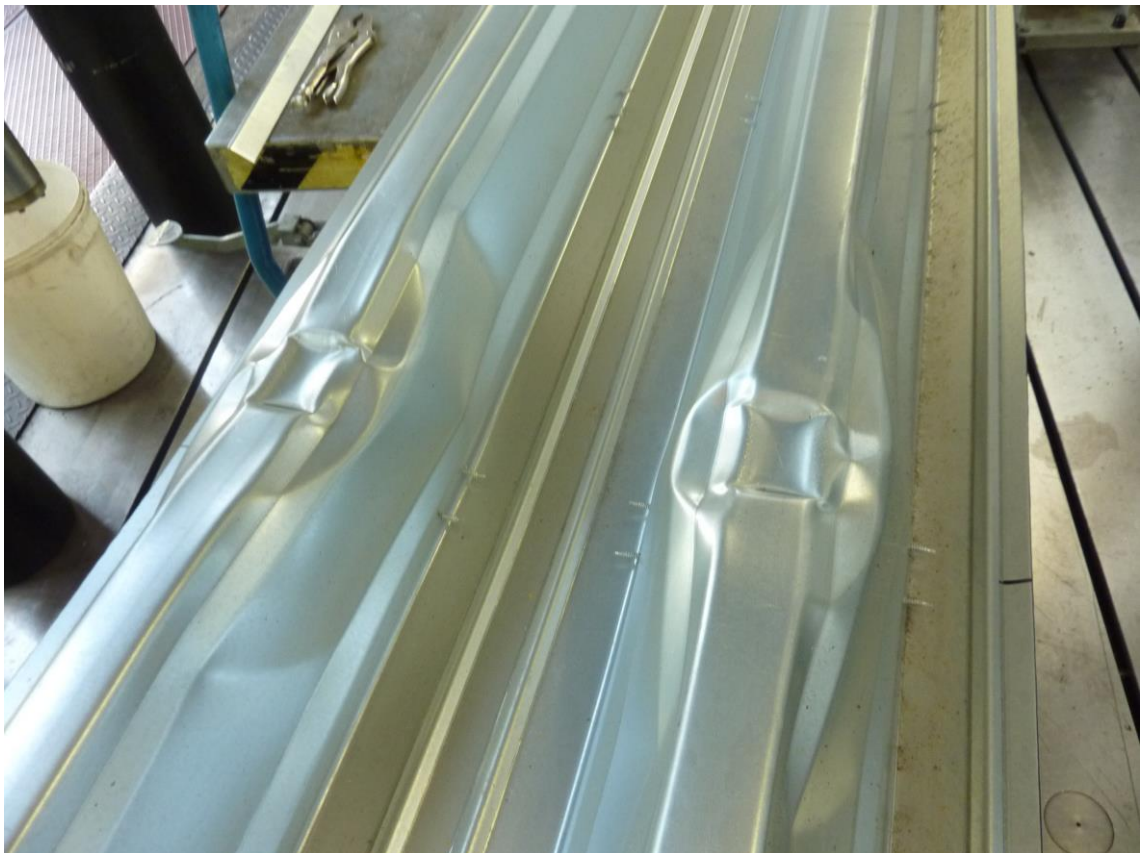


Figure B.15: Failure mode (exemplary IS-135-OL-60-100-280-1)

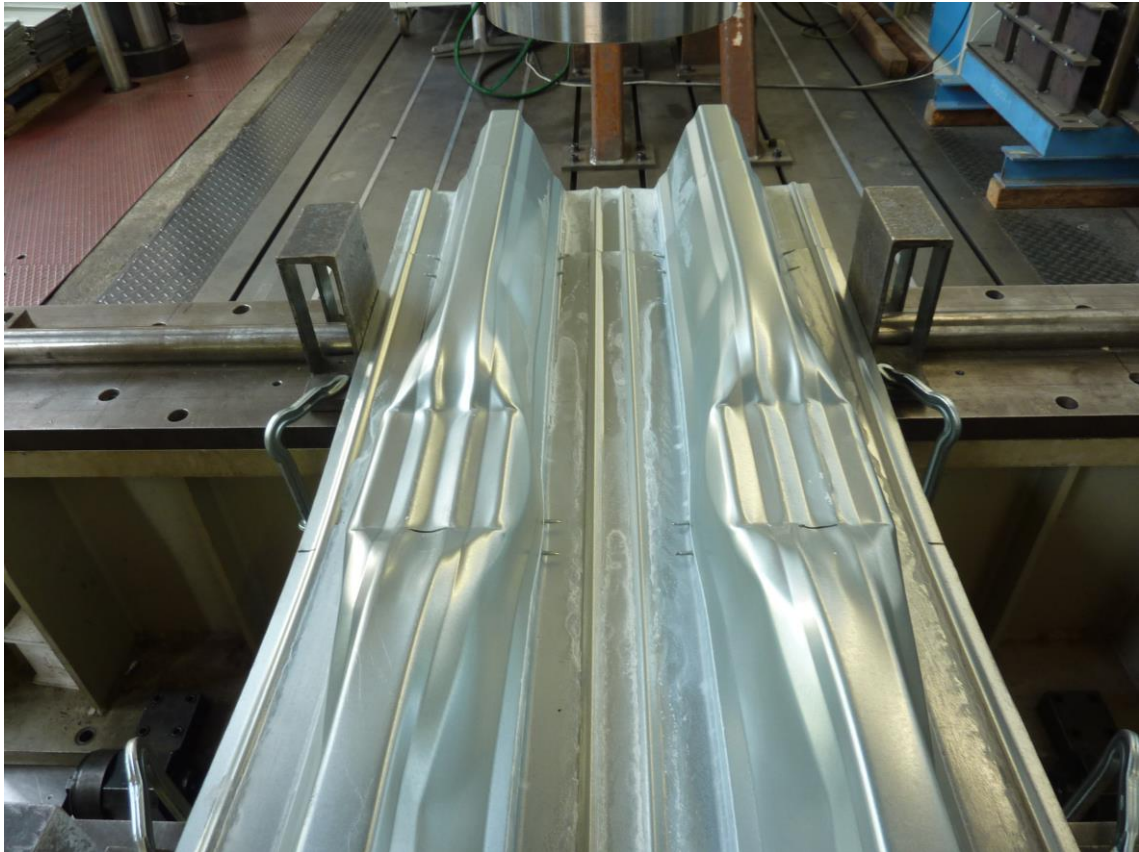


Figure B.16: Failure mode (exemplary IS-135-OL-160-100-80-1)

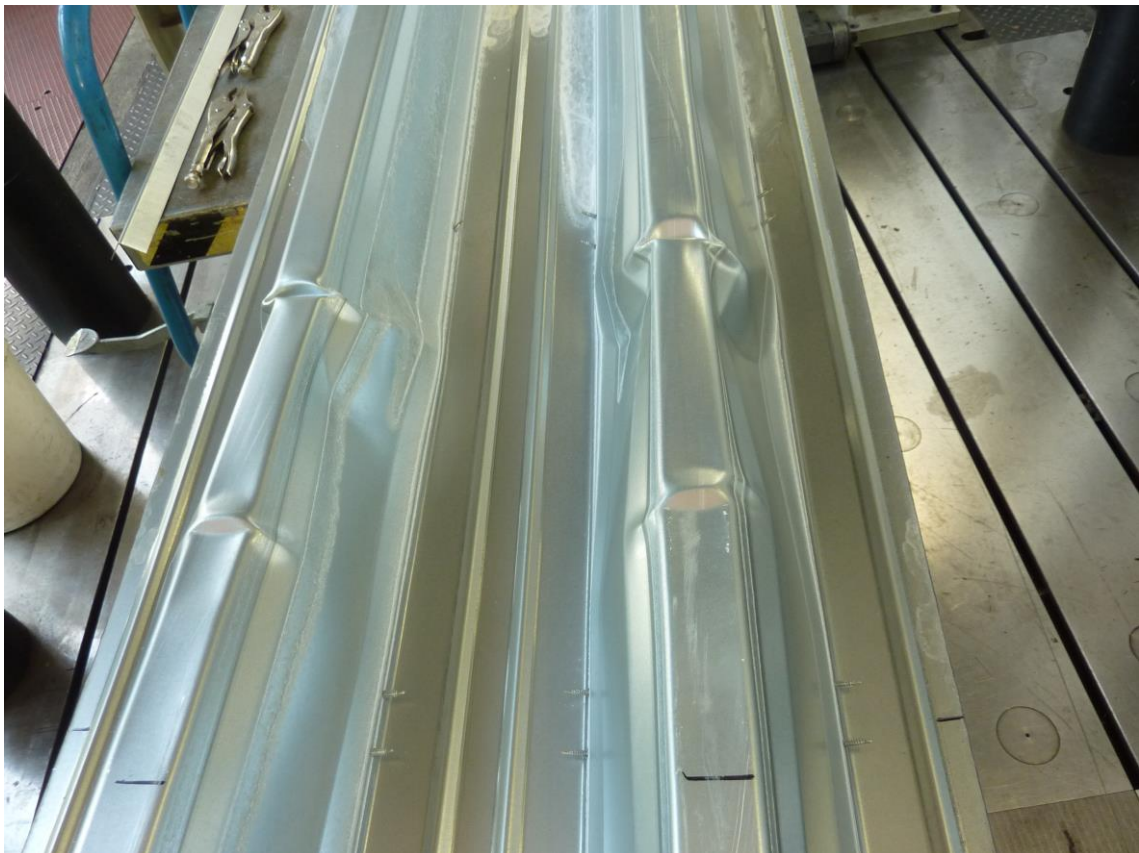


Figure B.17: Failure mode (exemplary IS-135-OL-160-100-280-1)

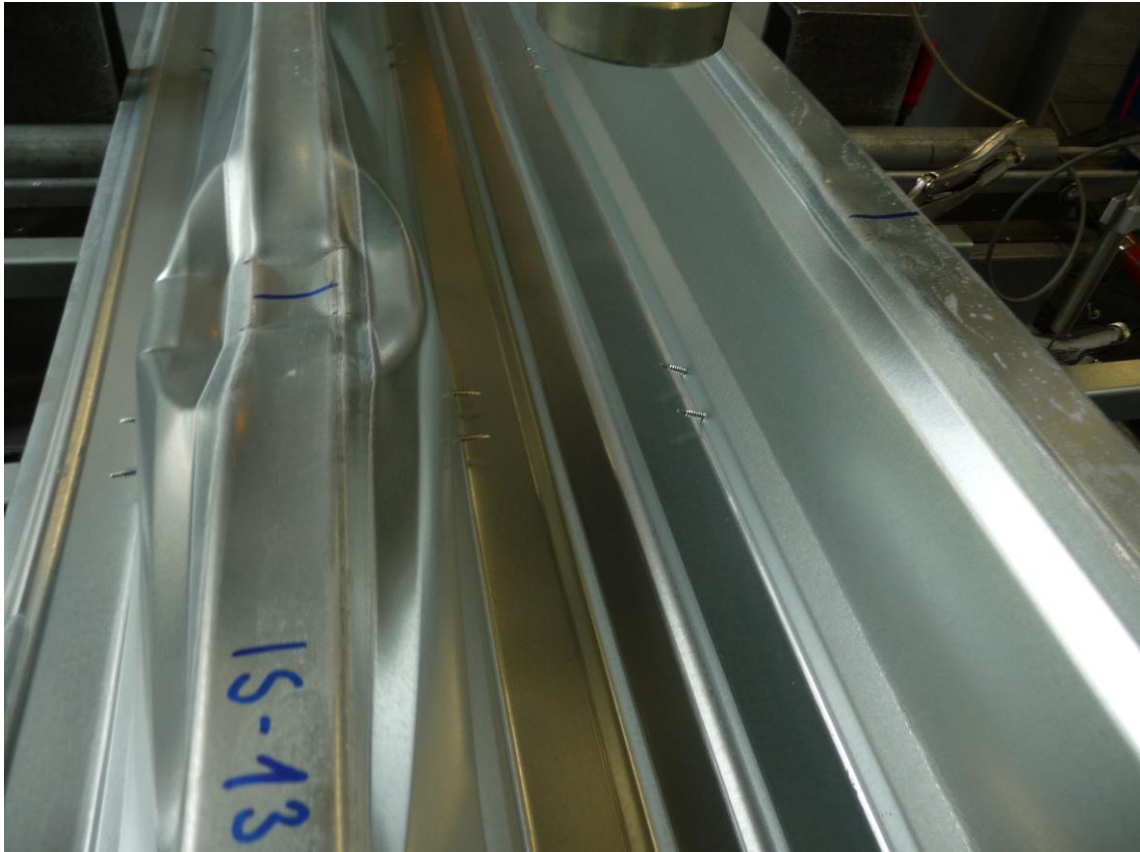


Figure B.18: Failure mode (exemplary IS-135-CR-60-75-80-2)

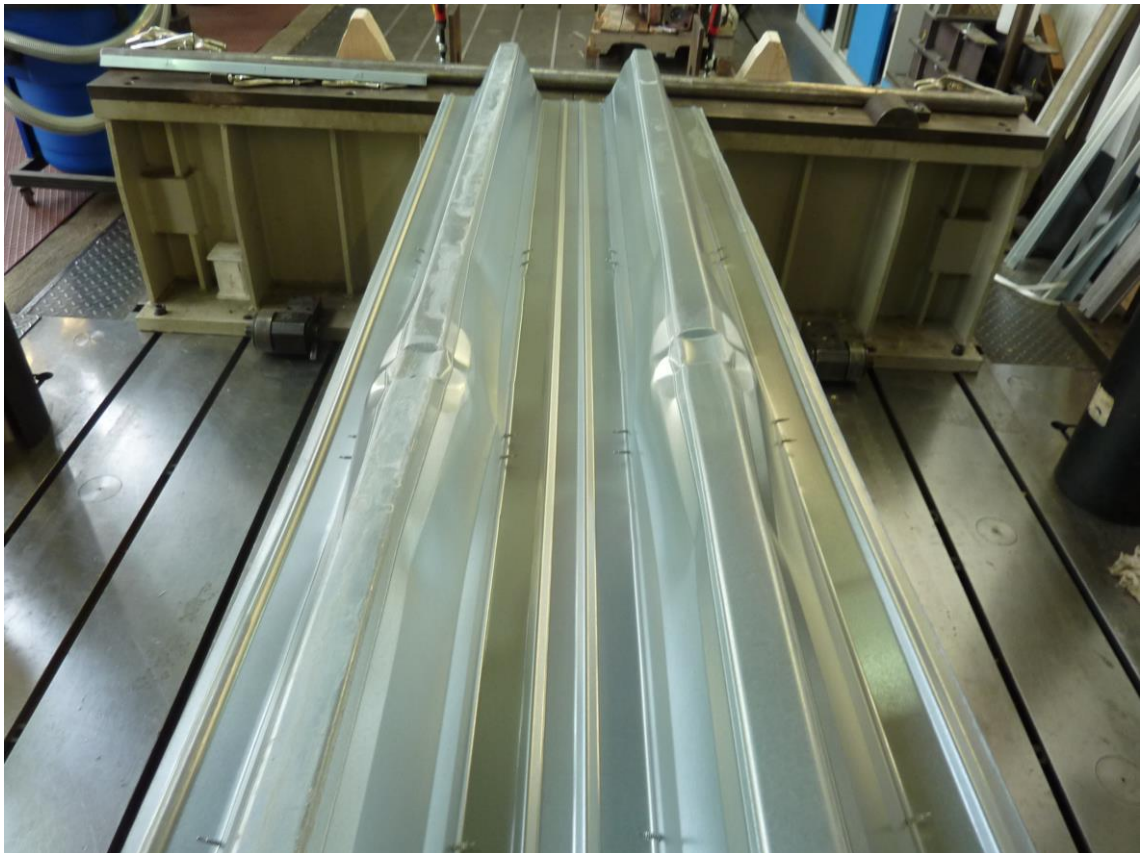


Figure B.19: Failure mode (exemplary IS-135-CR-60-75-240-1)

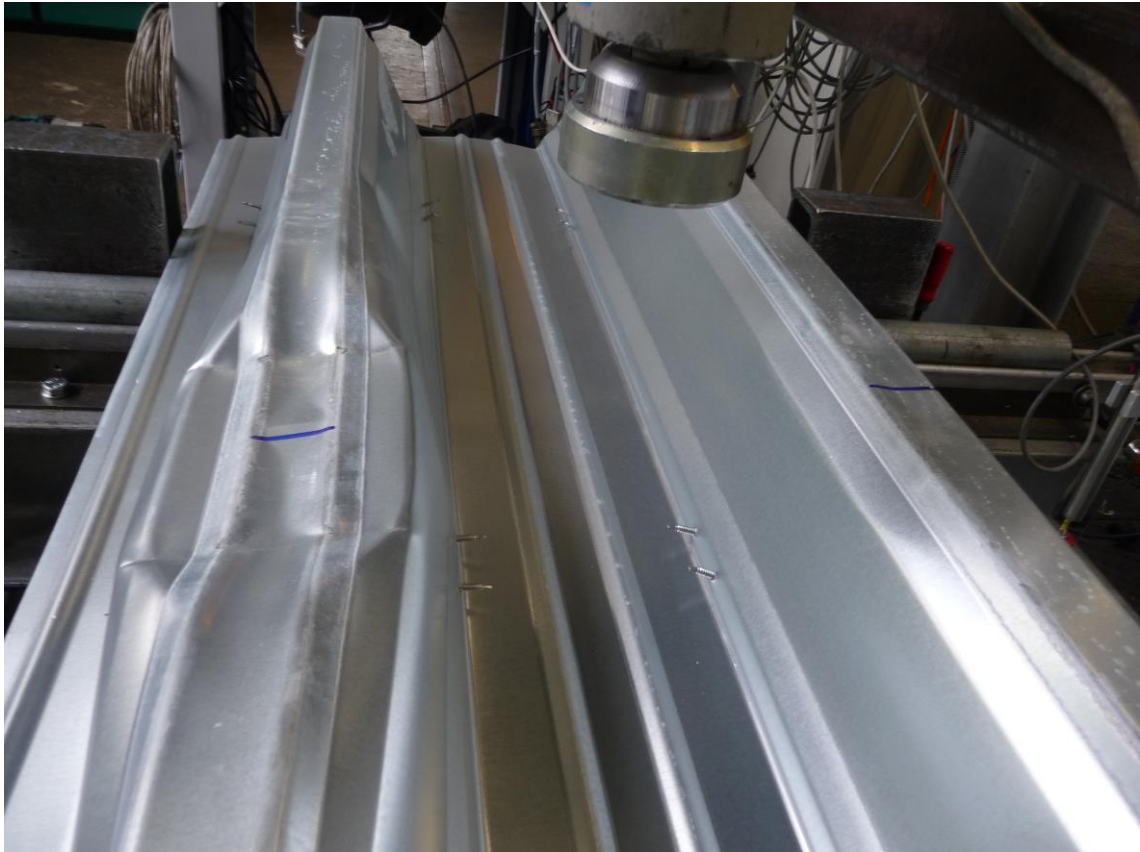


Figure B.20: Failure mode (exemplary IS-135-CR-160-75-80-1)

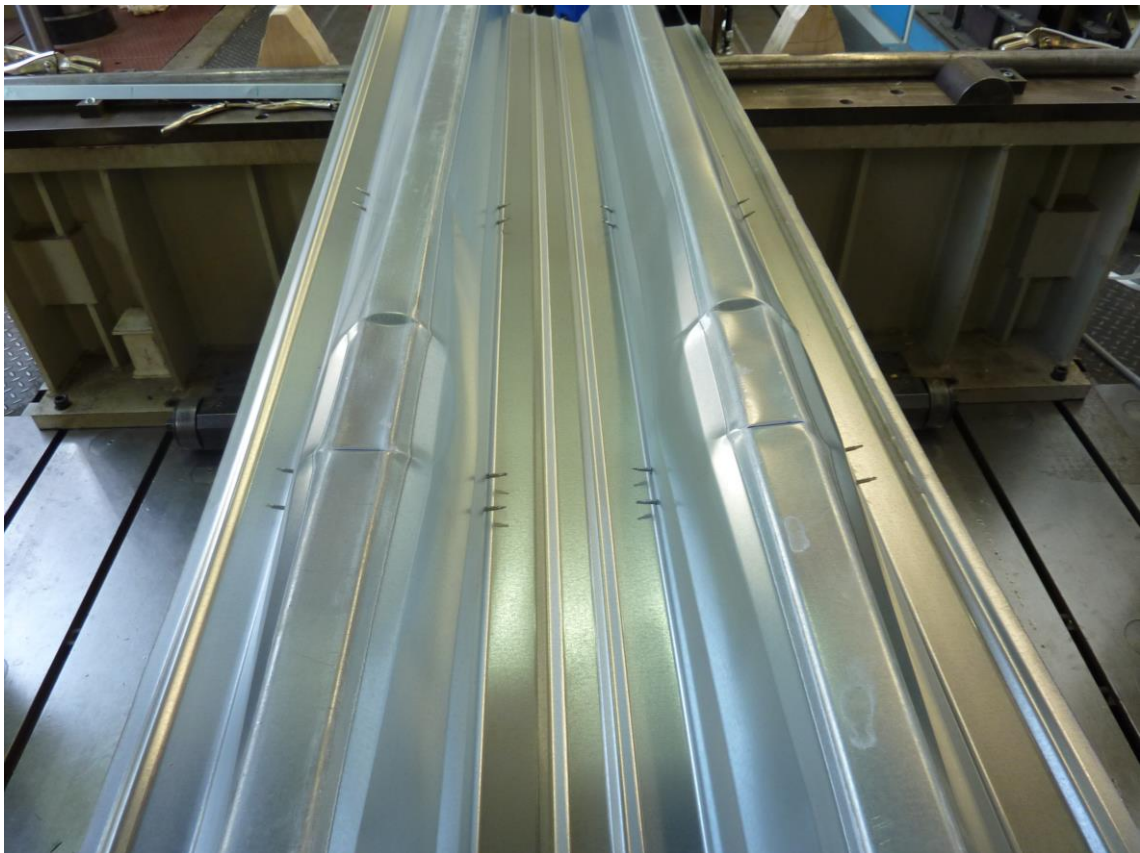


Figure B.21: Failure mode (exemplary IS-135-CR-160-75-240-1)

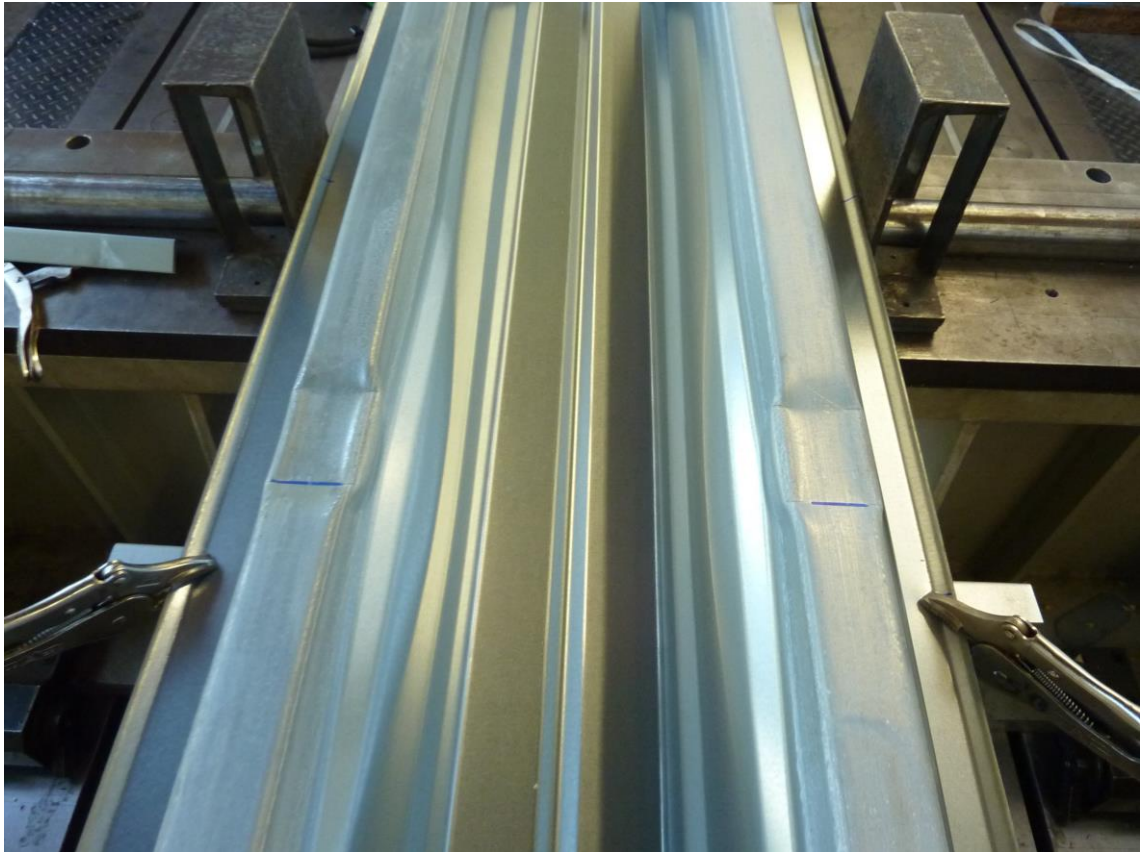


Figure B.22: Failure mode (exemplary IS-158-C-60-75-80-1)

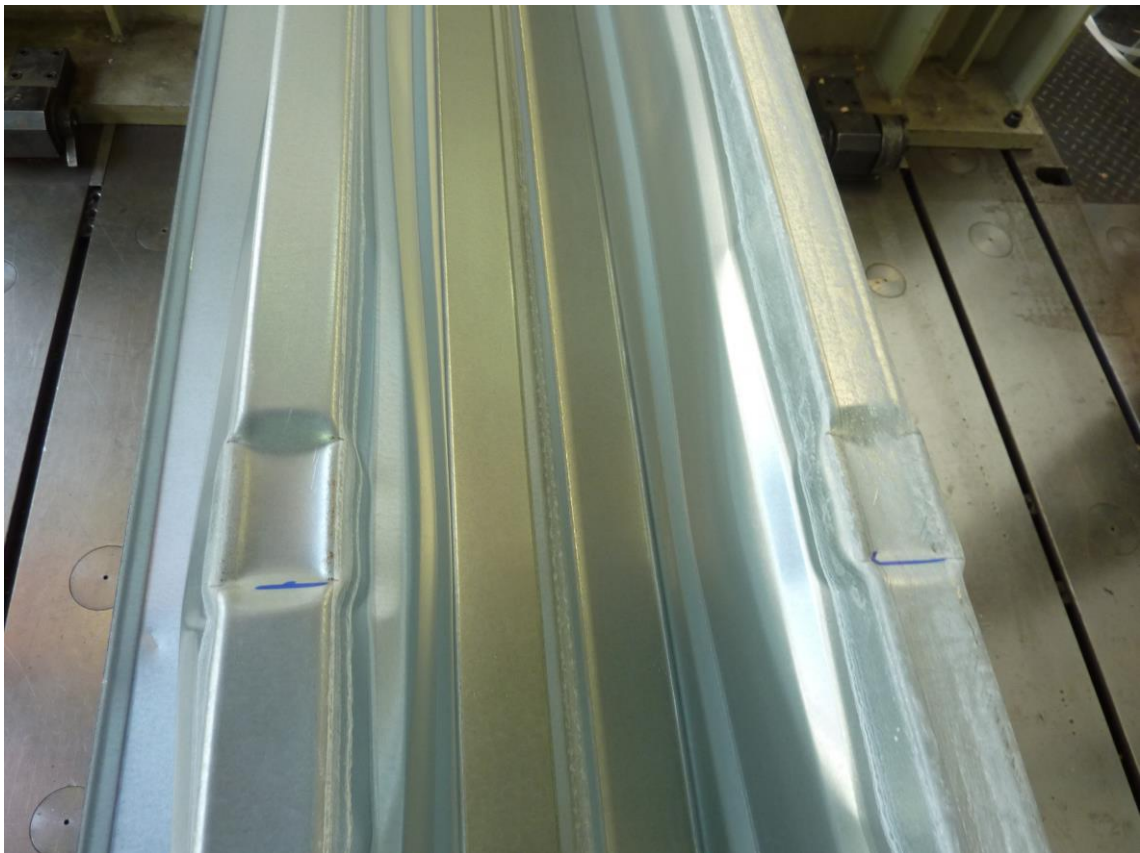


Figure B.23: Failure mode (exemplary IS-158-C-60-75-280-2)

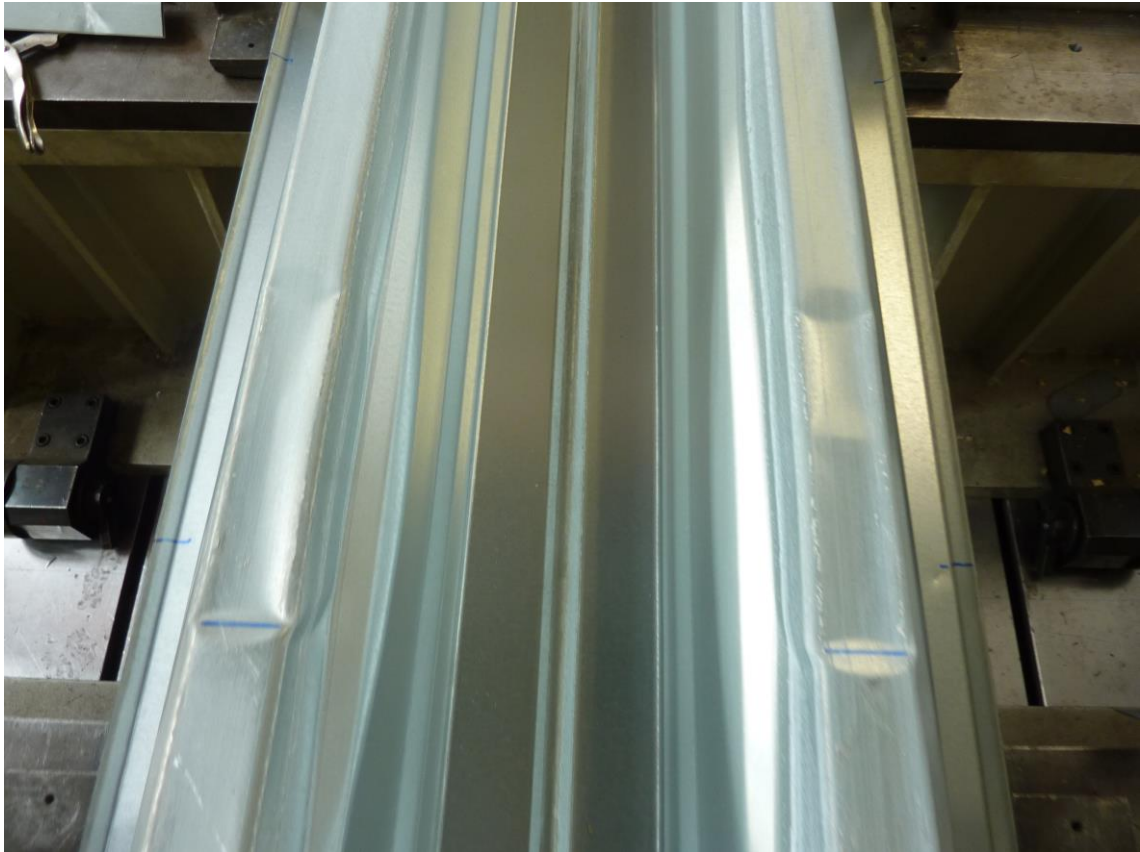


Figure B.24: Failure mode (exemplary IS-158-C-160-75-80-1)

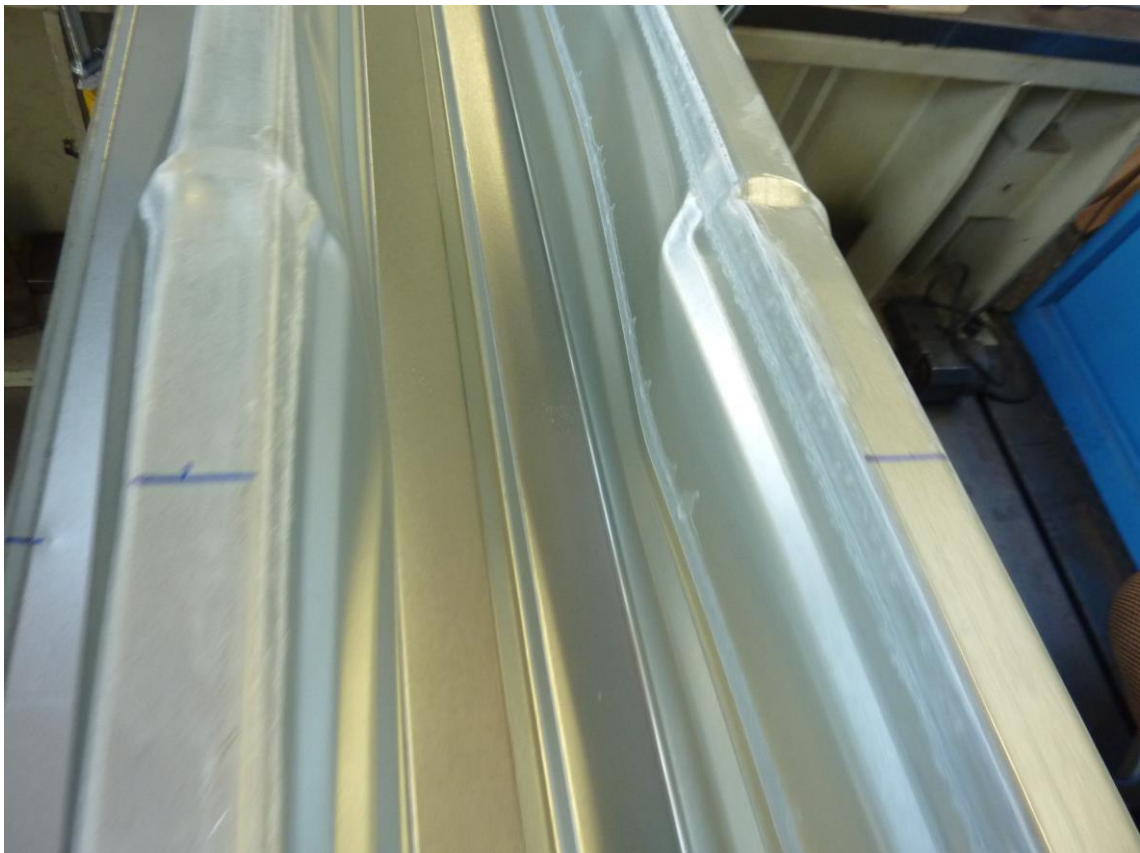


Figure B.25: Failure mode (exemplary IS-158-C-160-75-280-2)

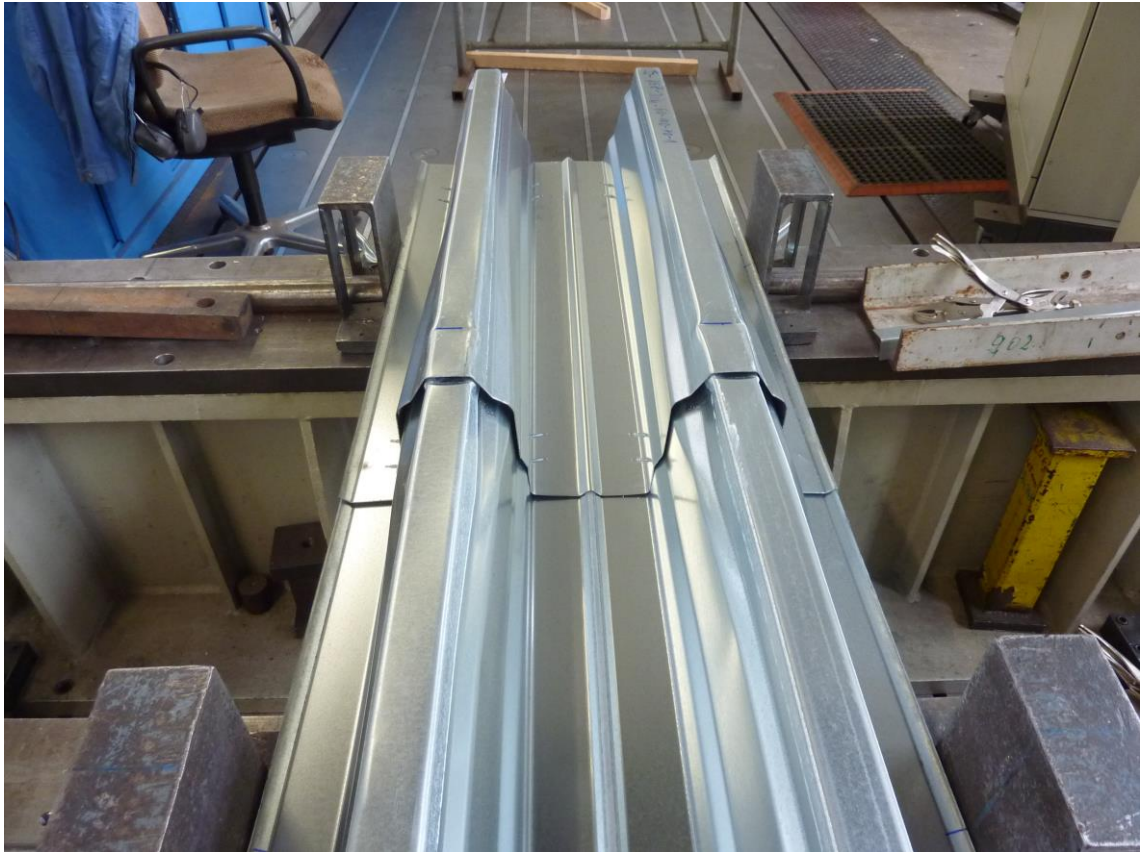


Figure B.26: Failure mode (exemplary IS-158-DIN-60-100-80-1)

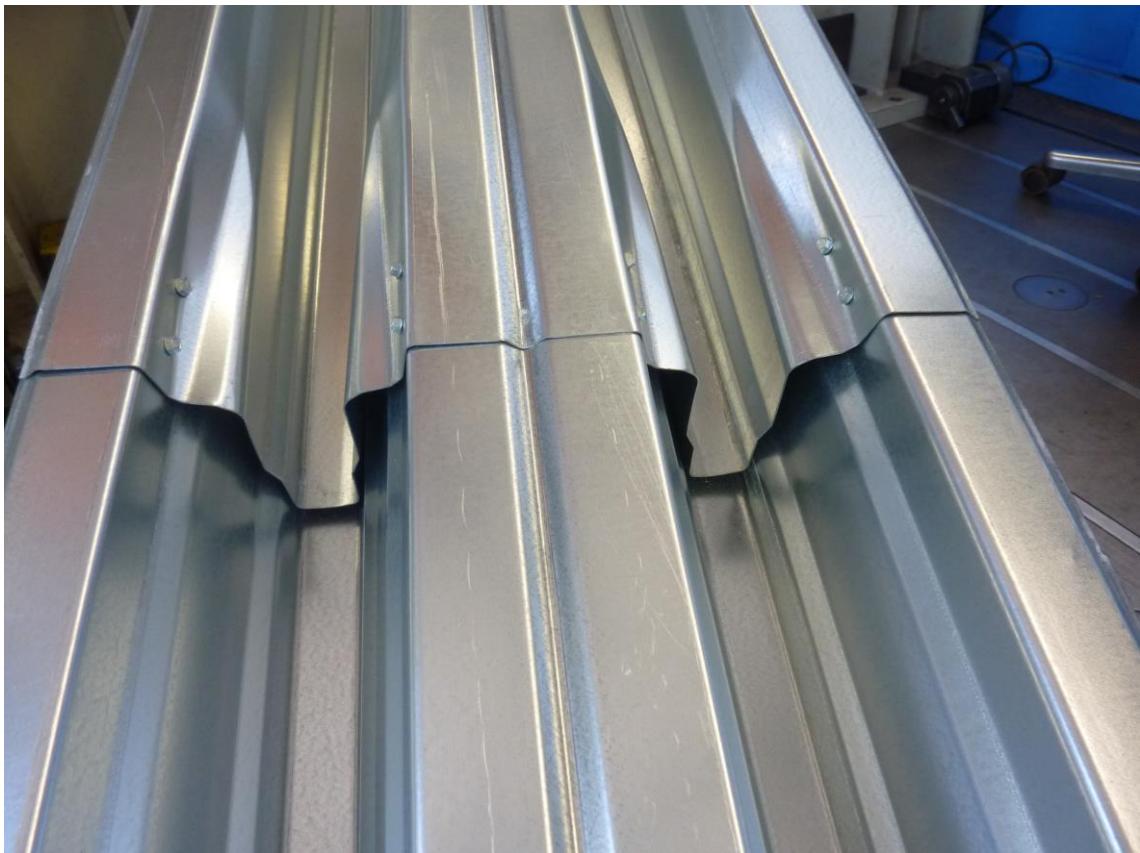


Figure B.27: Failure mode (exemplary IS-158-DIN-60-100-320-2)

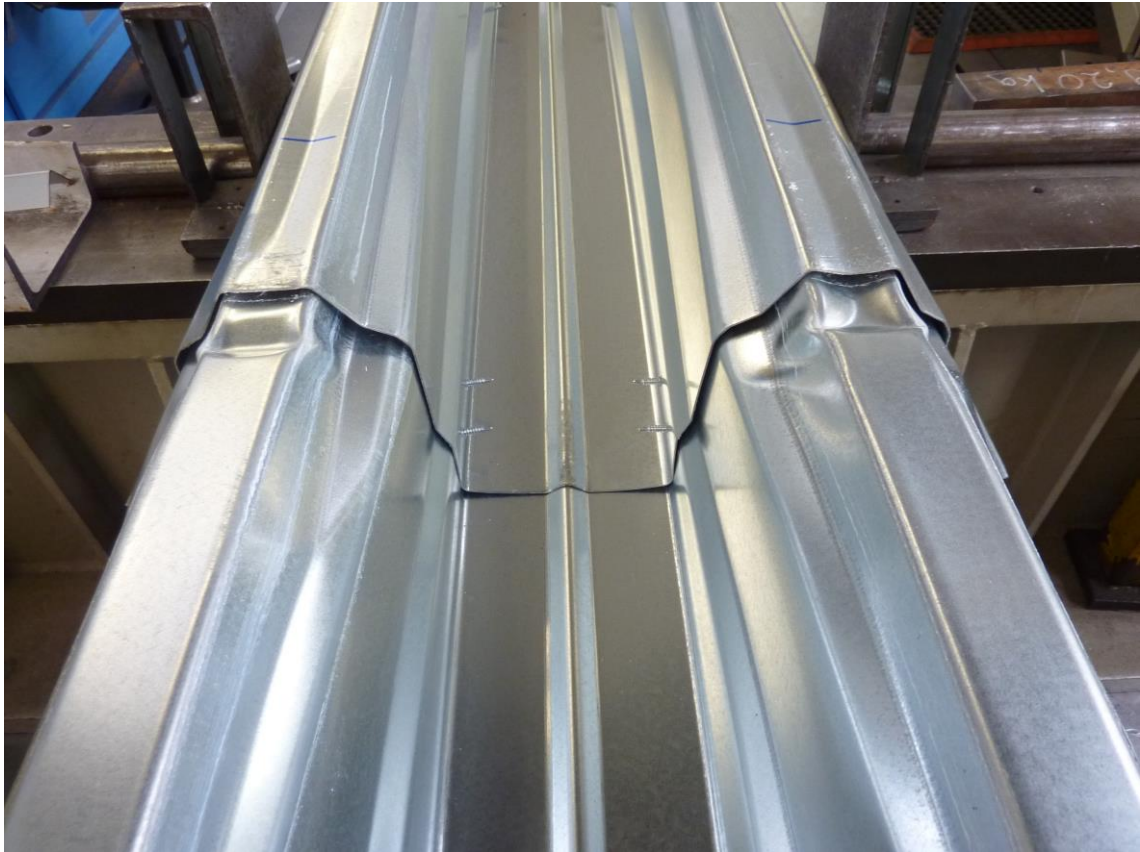


Figure B.28: Failure mode (exemplary IS-158-DIN-160-100-80-1)

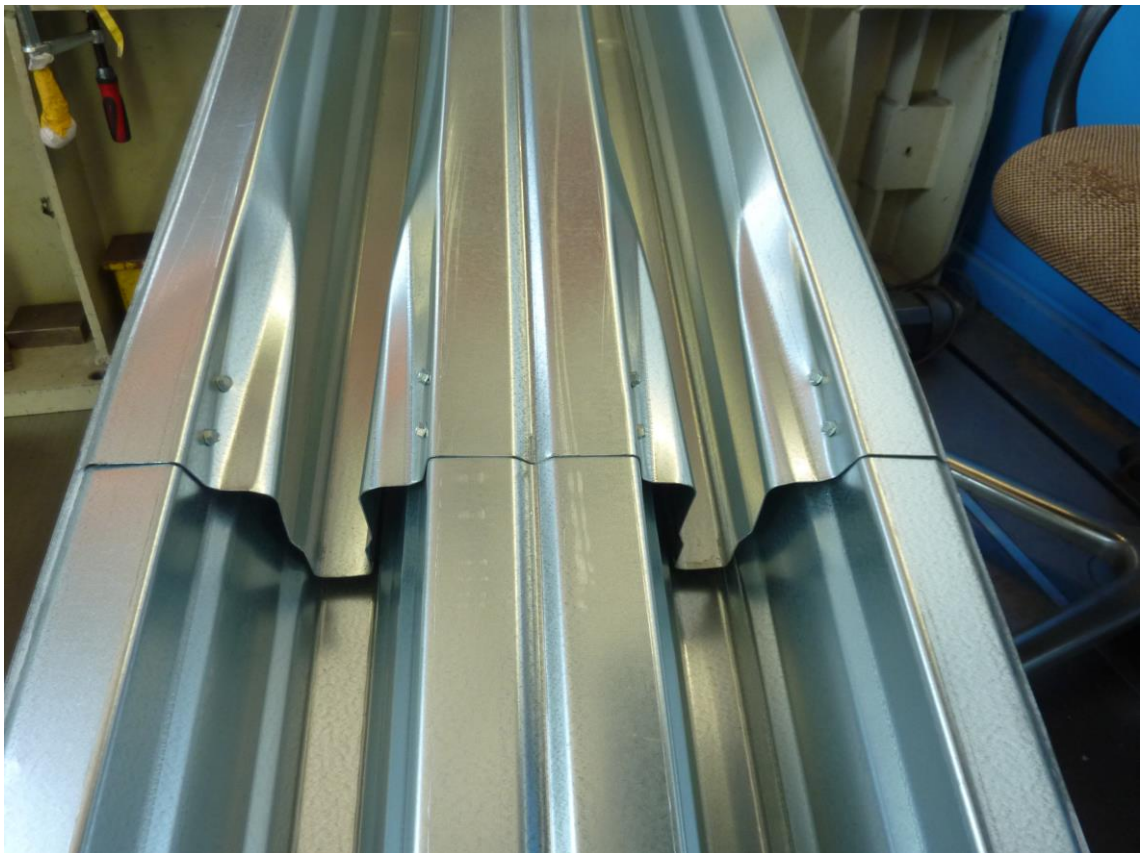


Figure B.29: Failure mode (exemplary IS-158-DIN-160-100-320-1)

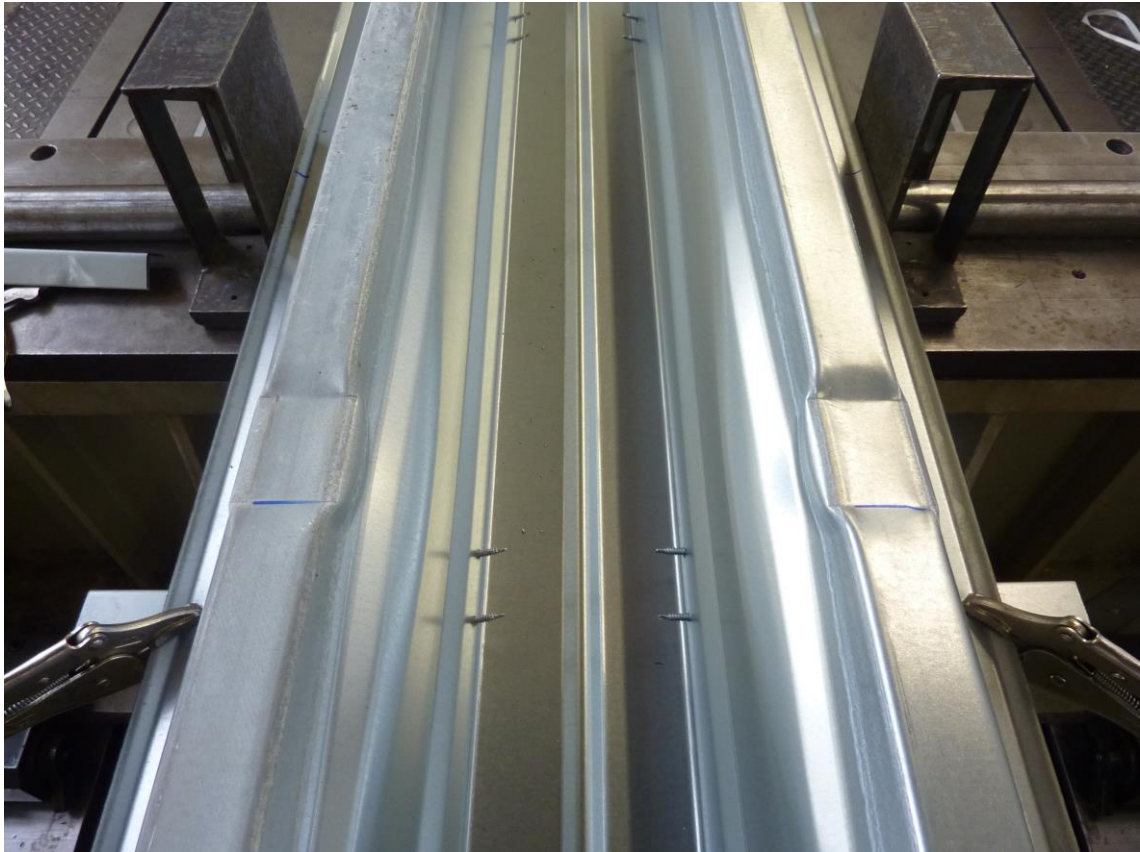


Figure B.30: Failure mode (exemplary IS-158-OL-60-75-80-2)

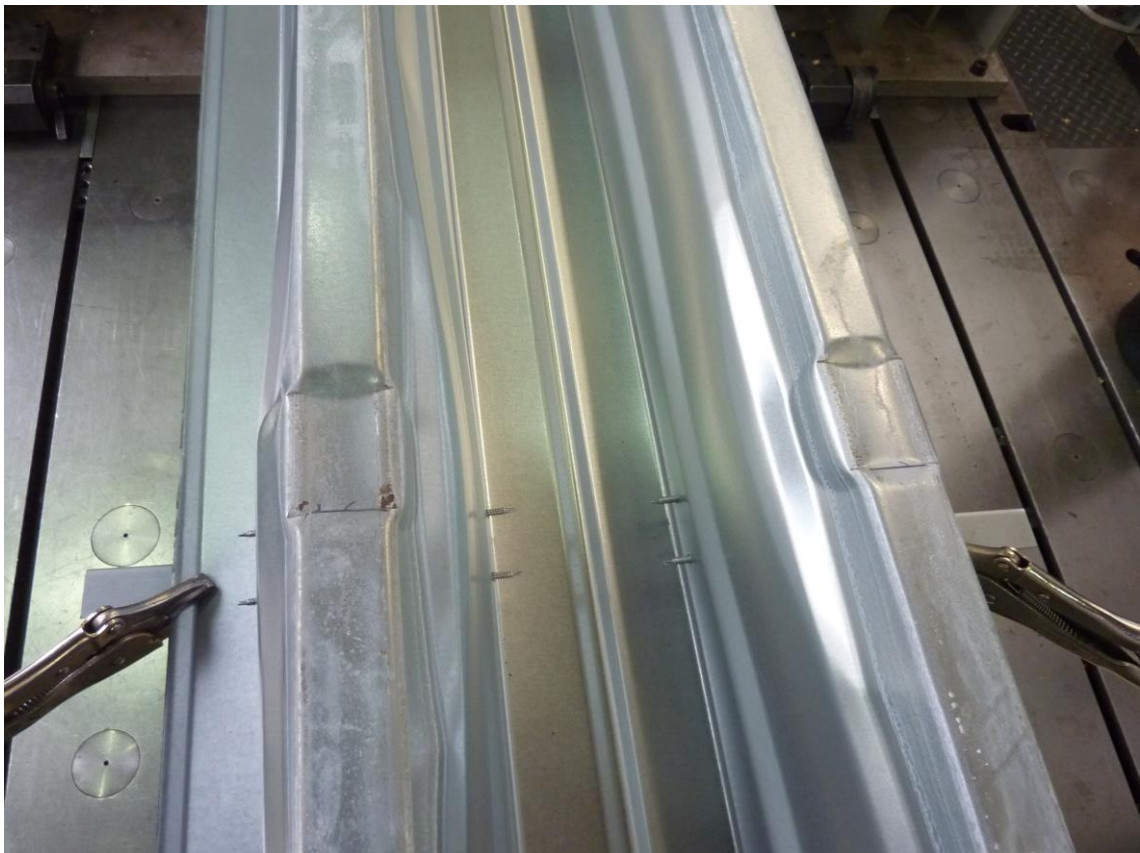


Figure B.31: Failure mode (exemplary IS-158-OL-60-75-280-1)

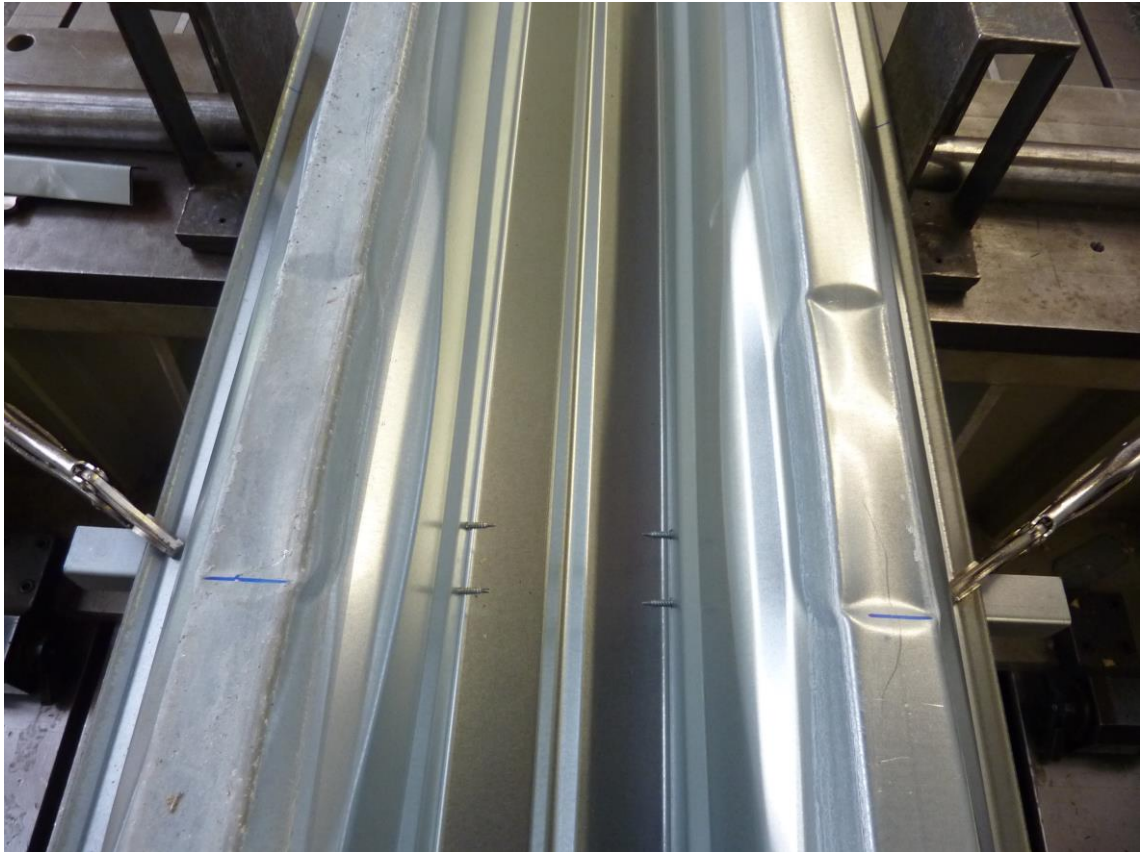


Figure B.32: Failure mode (exemplary IS-158-OL-160-75-80-1)

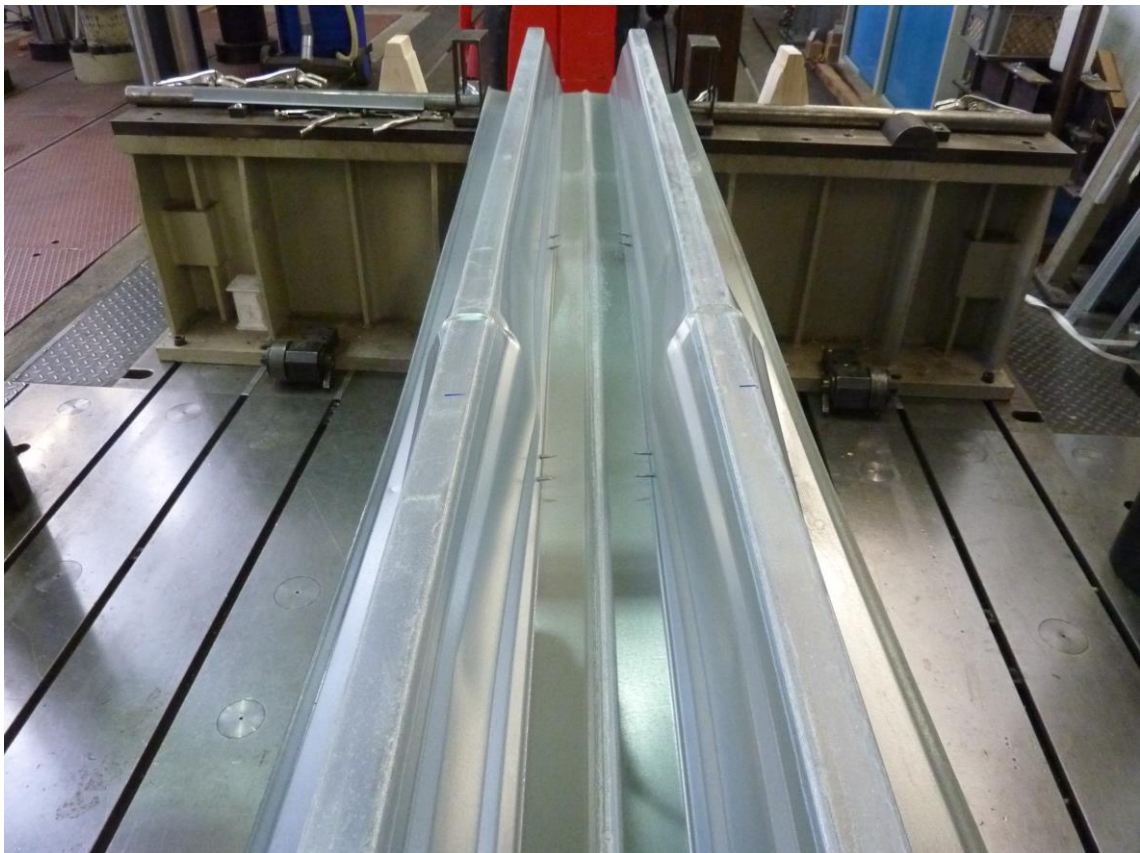


Figure B.33: Failure mode (exemplary IS-158-OL-160-75-280-1)

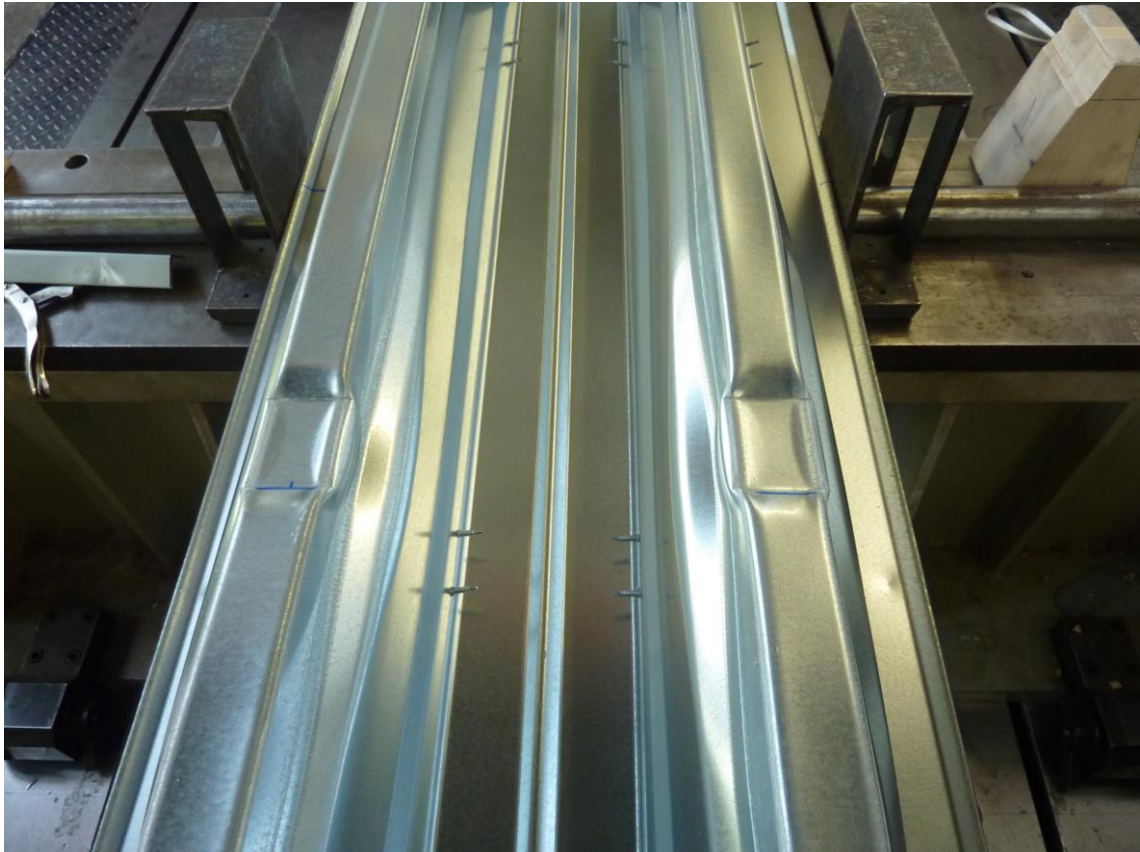


Figure B.34: Failure mode (exemplary IS-158-CR-60-100-80-2)

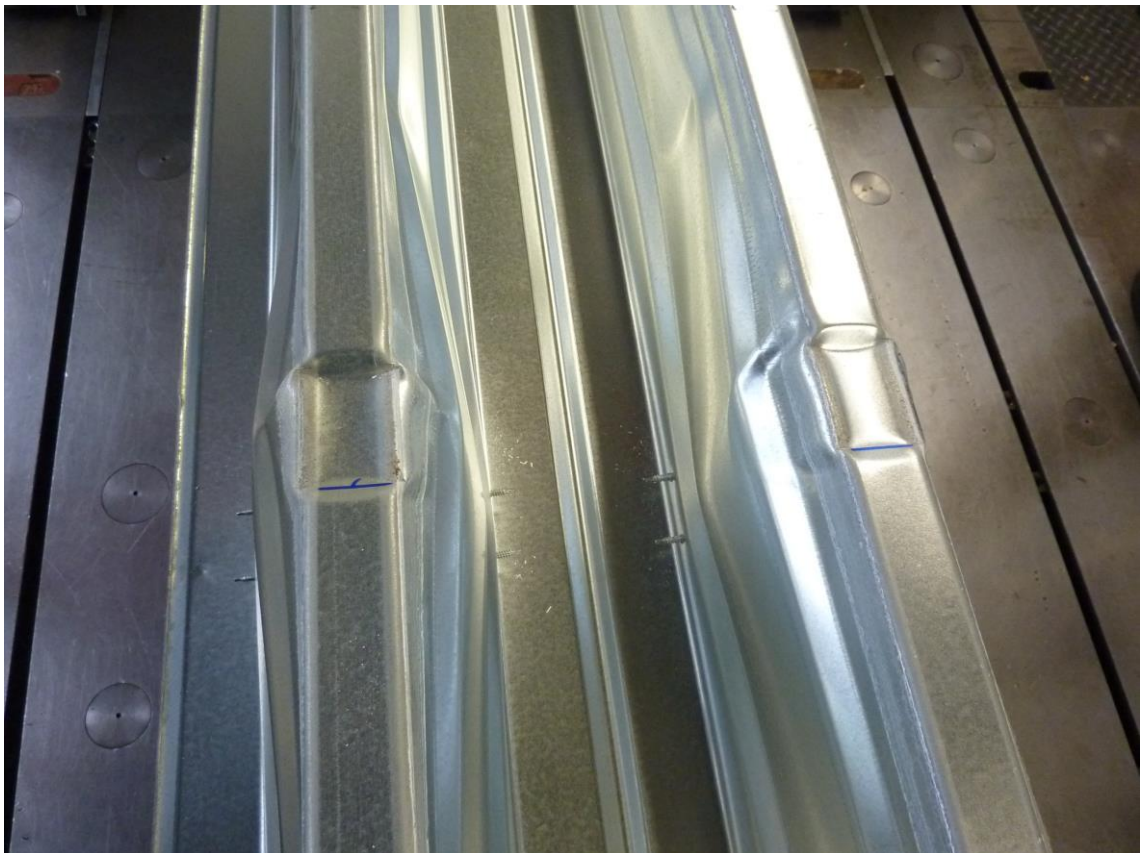


Figure B.35: Failure mode (exemplary IS-158-CR-60-100-320-2)

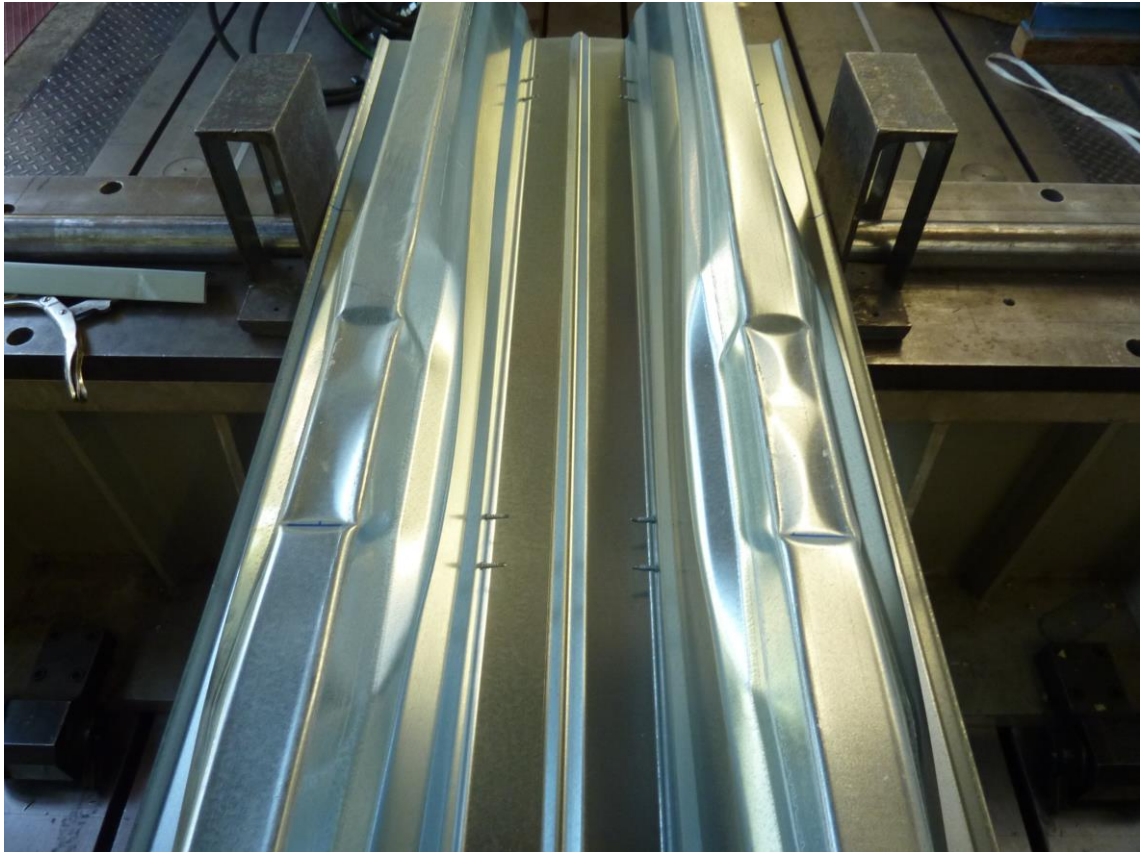
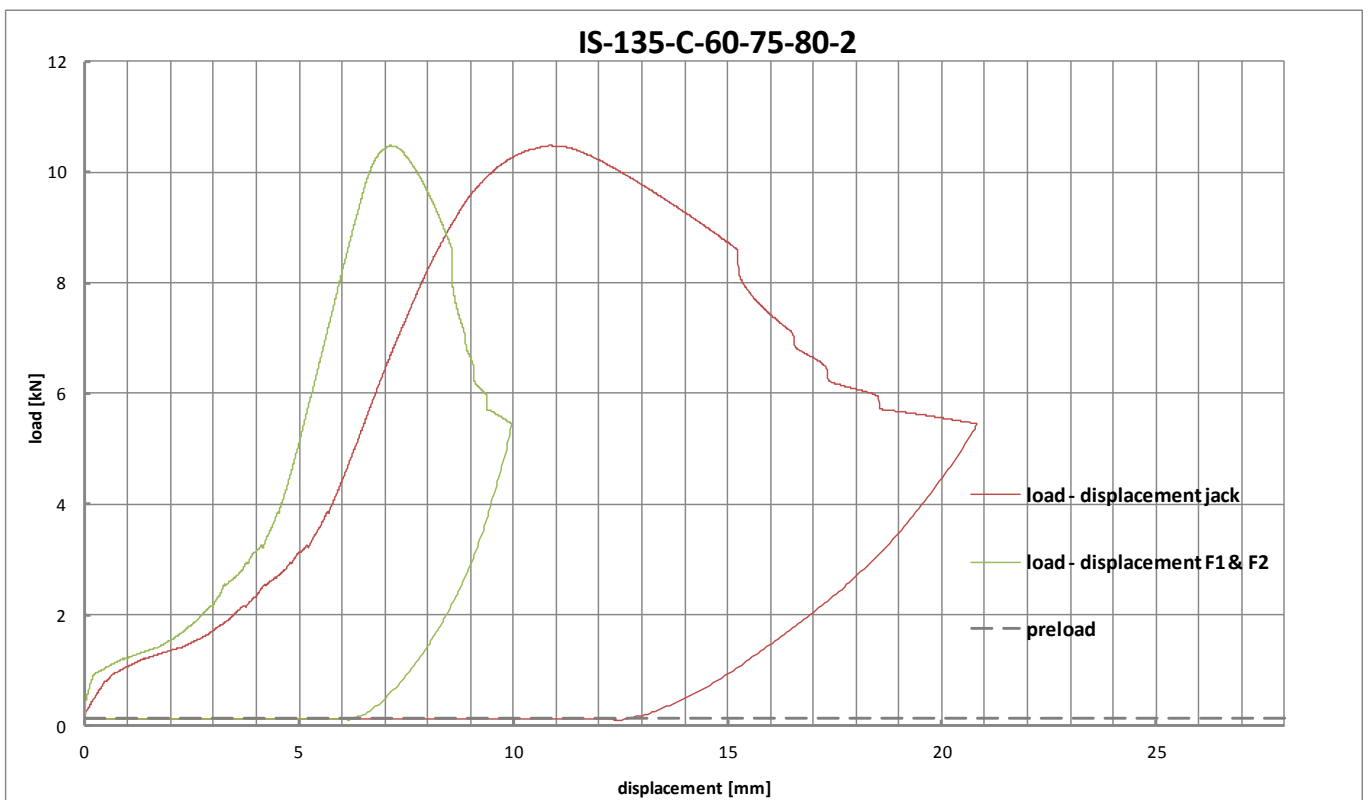
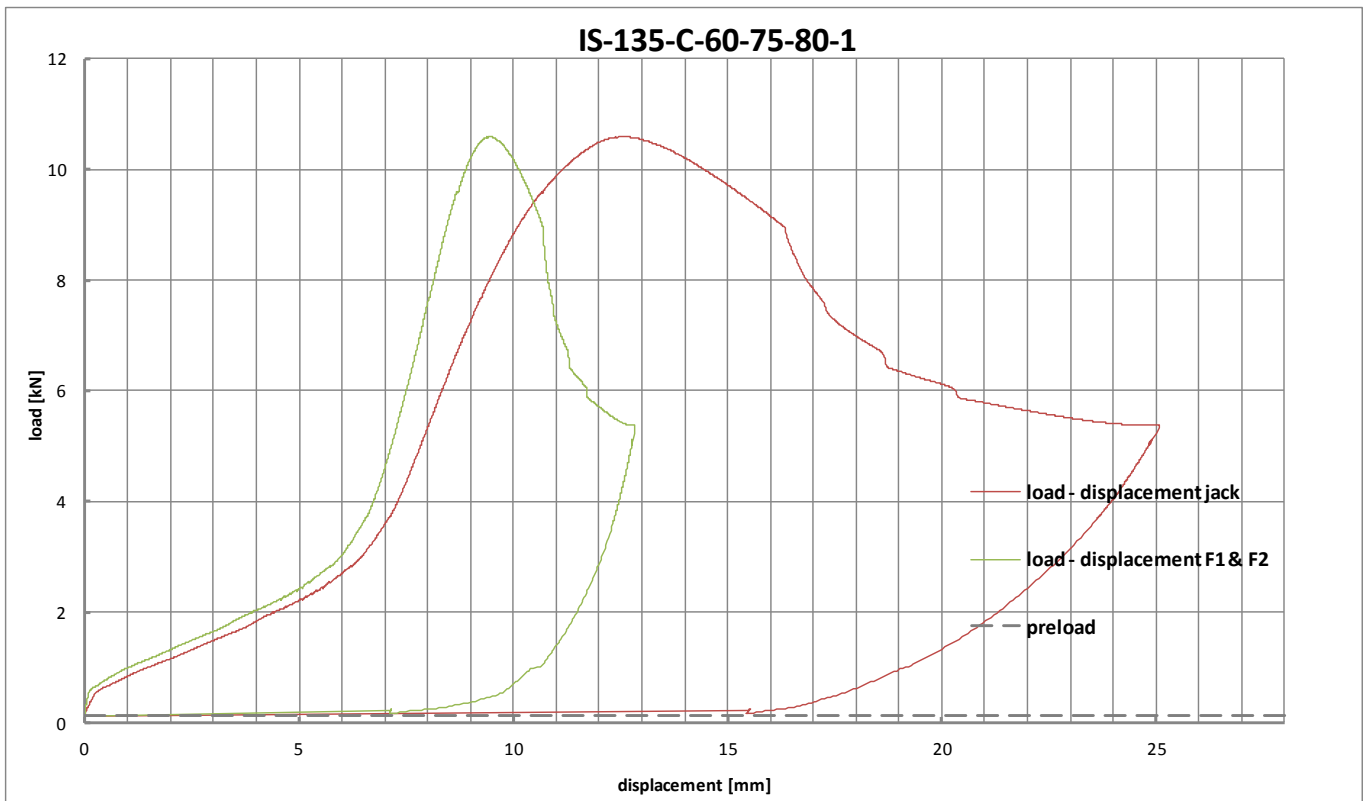


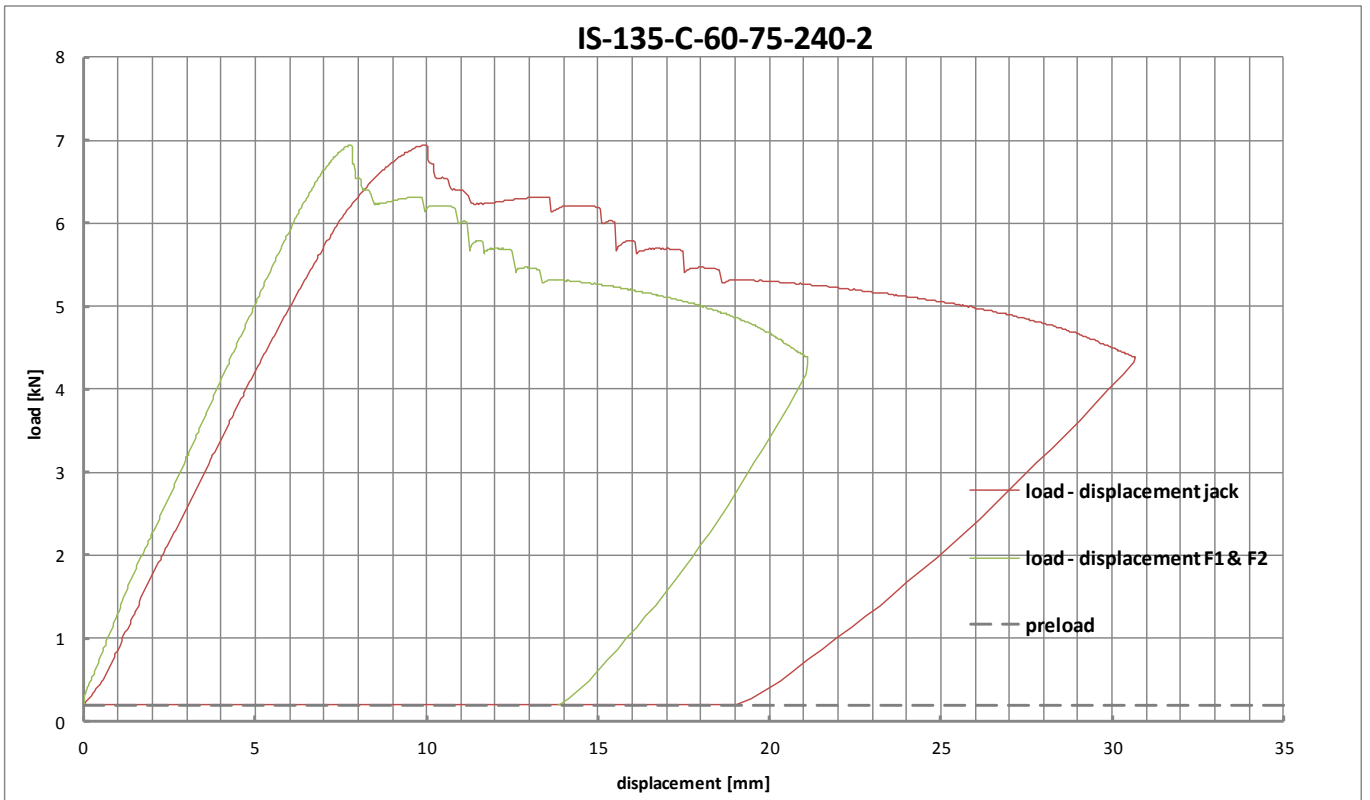
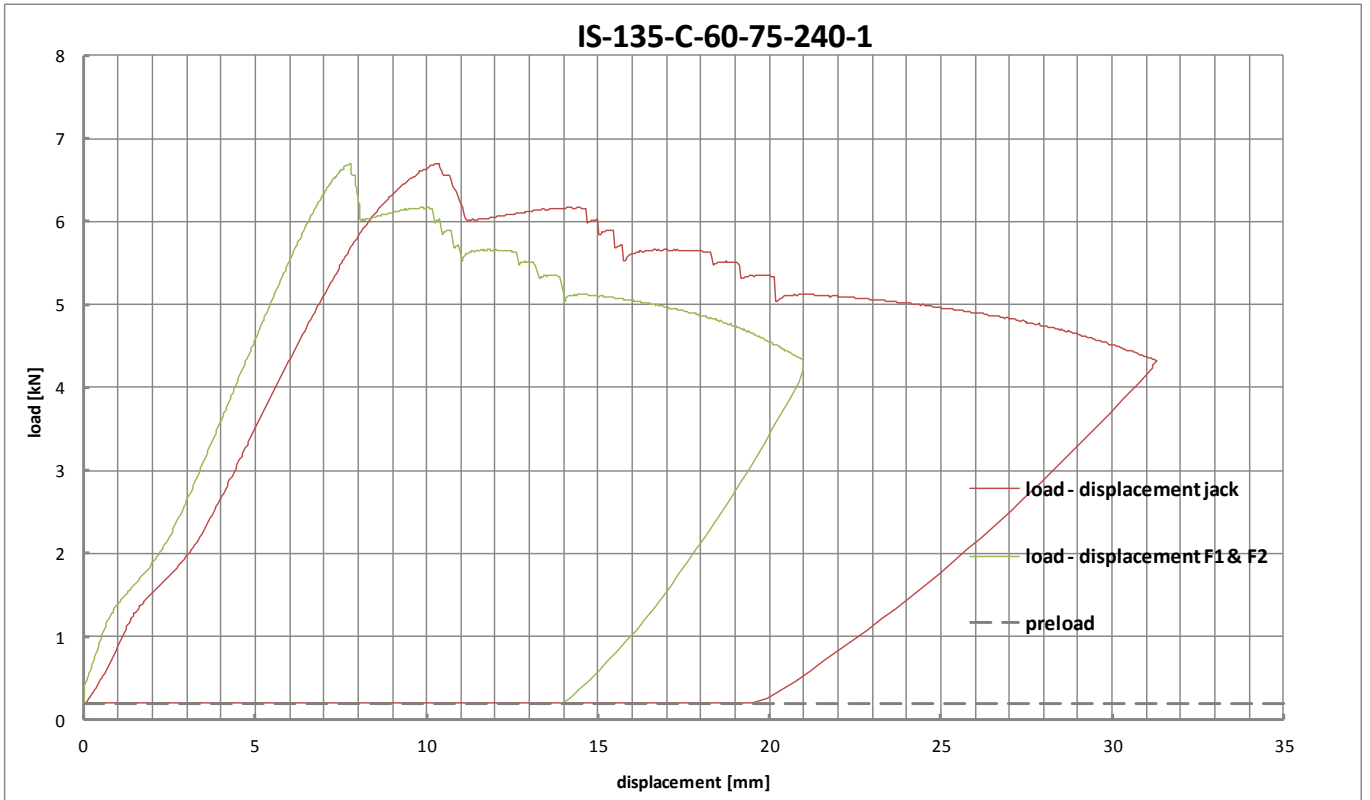
Figure B.36: Failure mode (exemplary IS-158-CR-160-100-80-2)

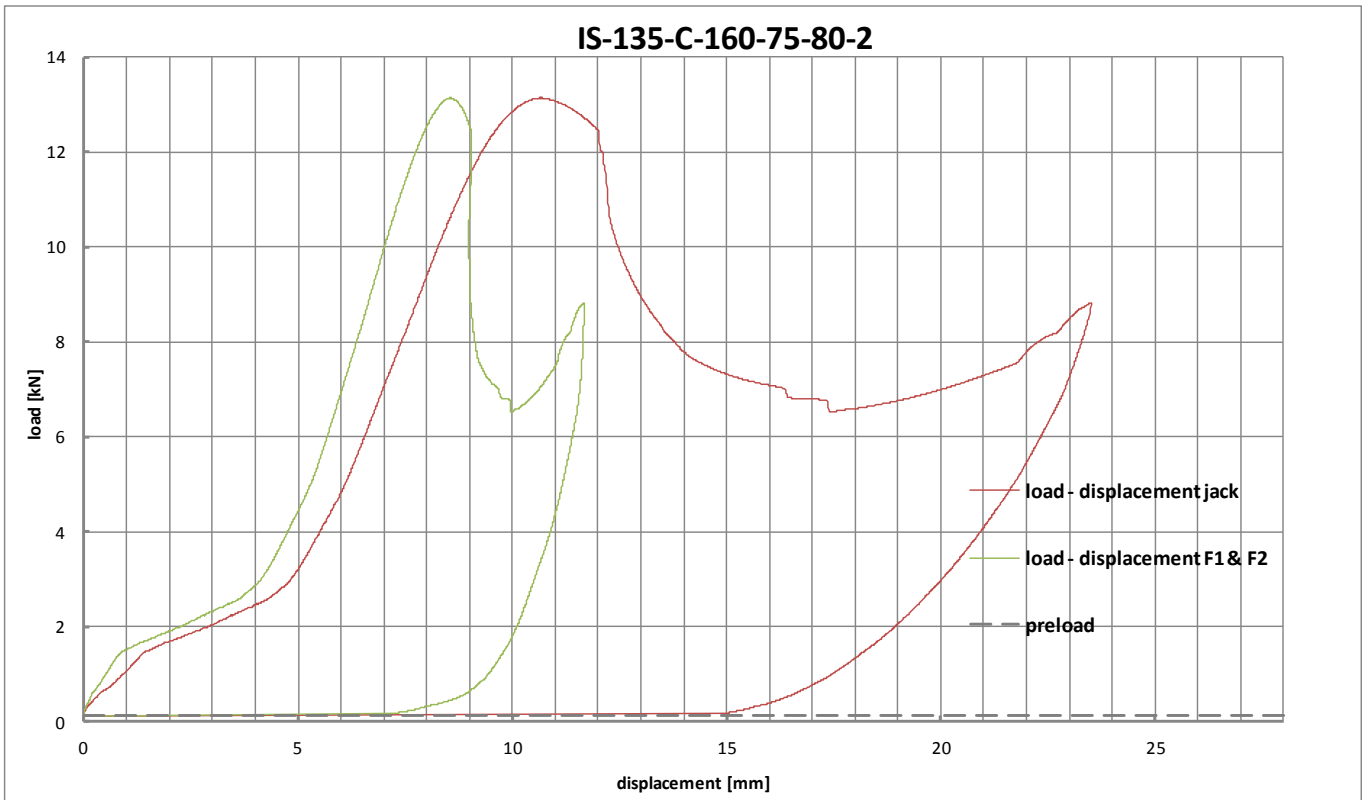
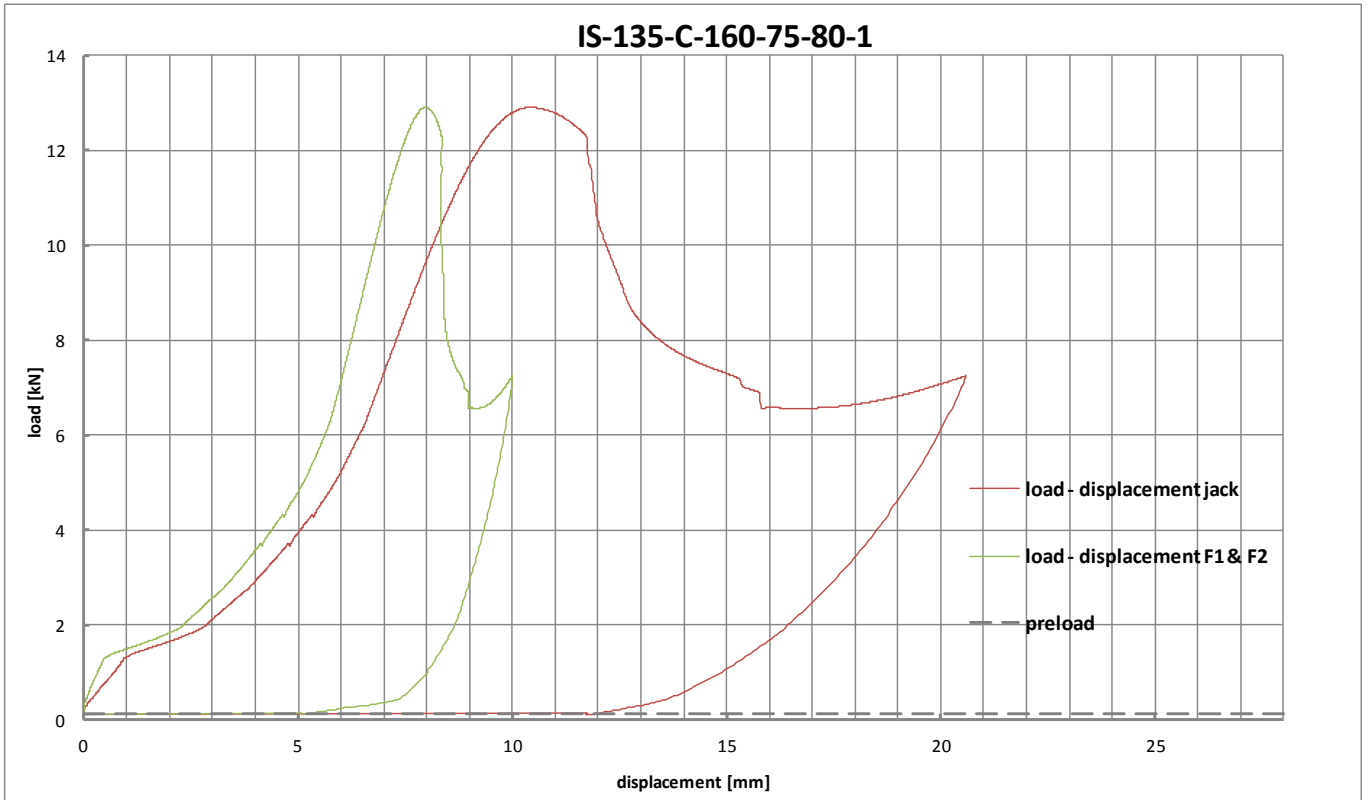


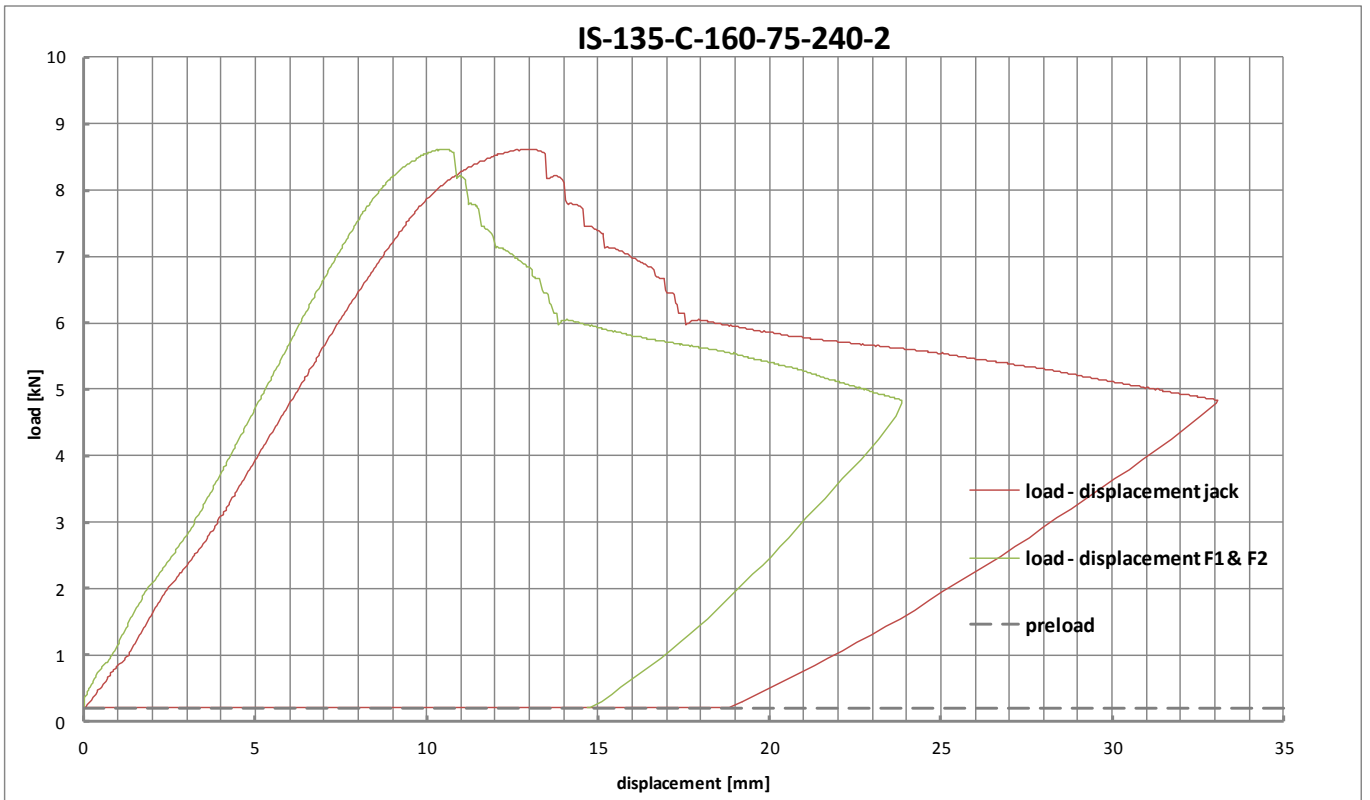
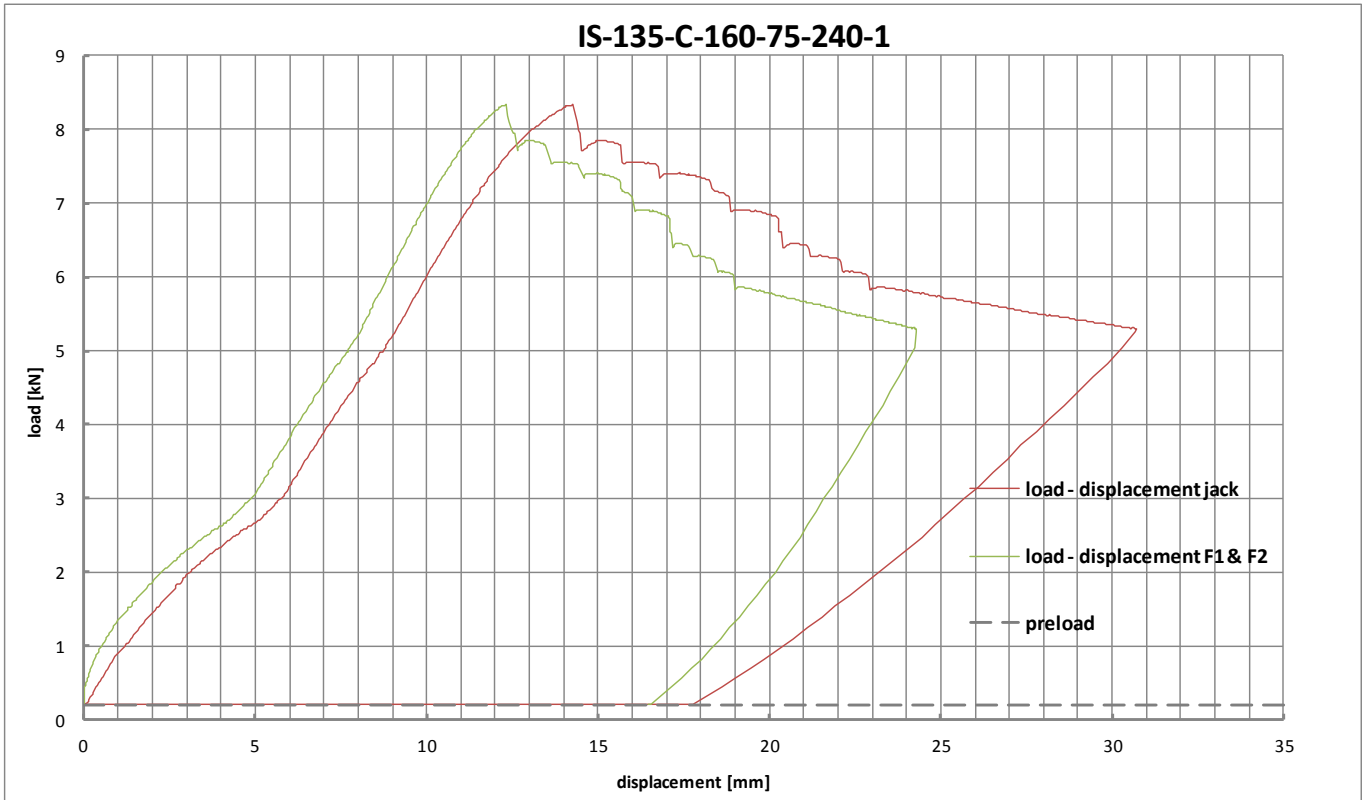
Figure B.37: Failure mode (exemplary IS-158-CR-160-100-320-2)

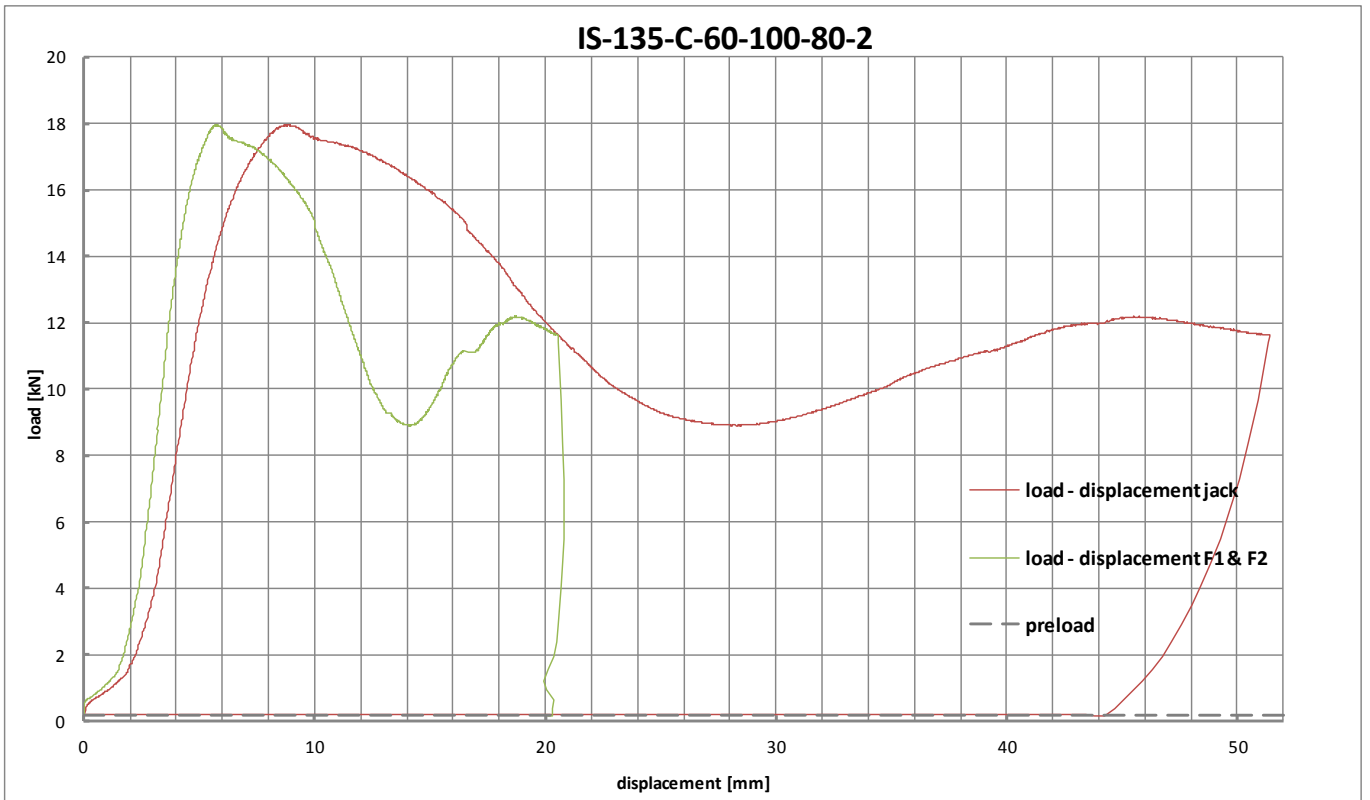
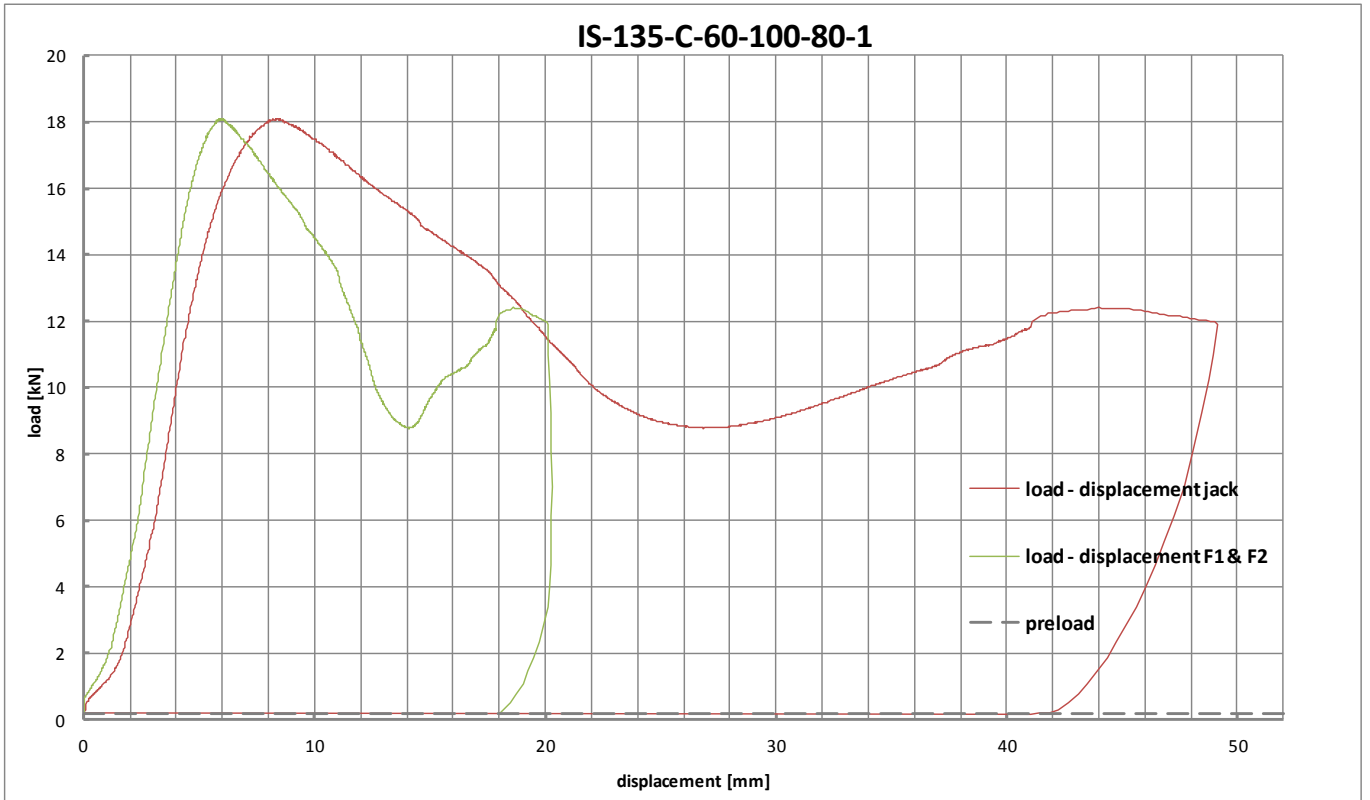
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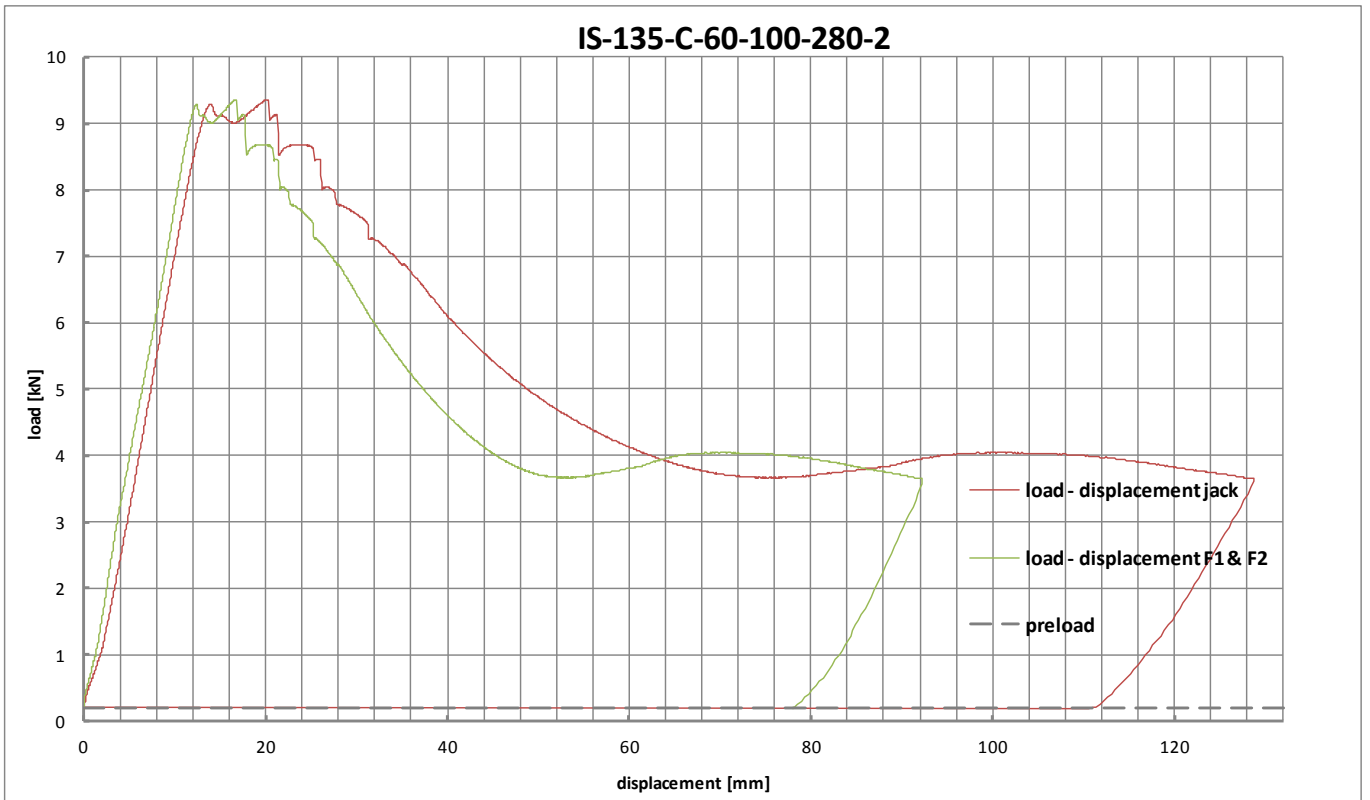
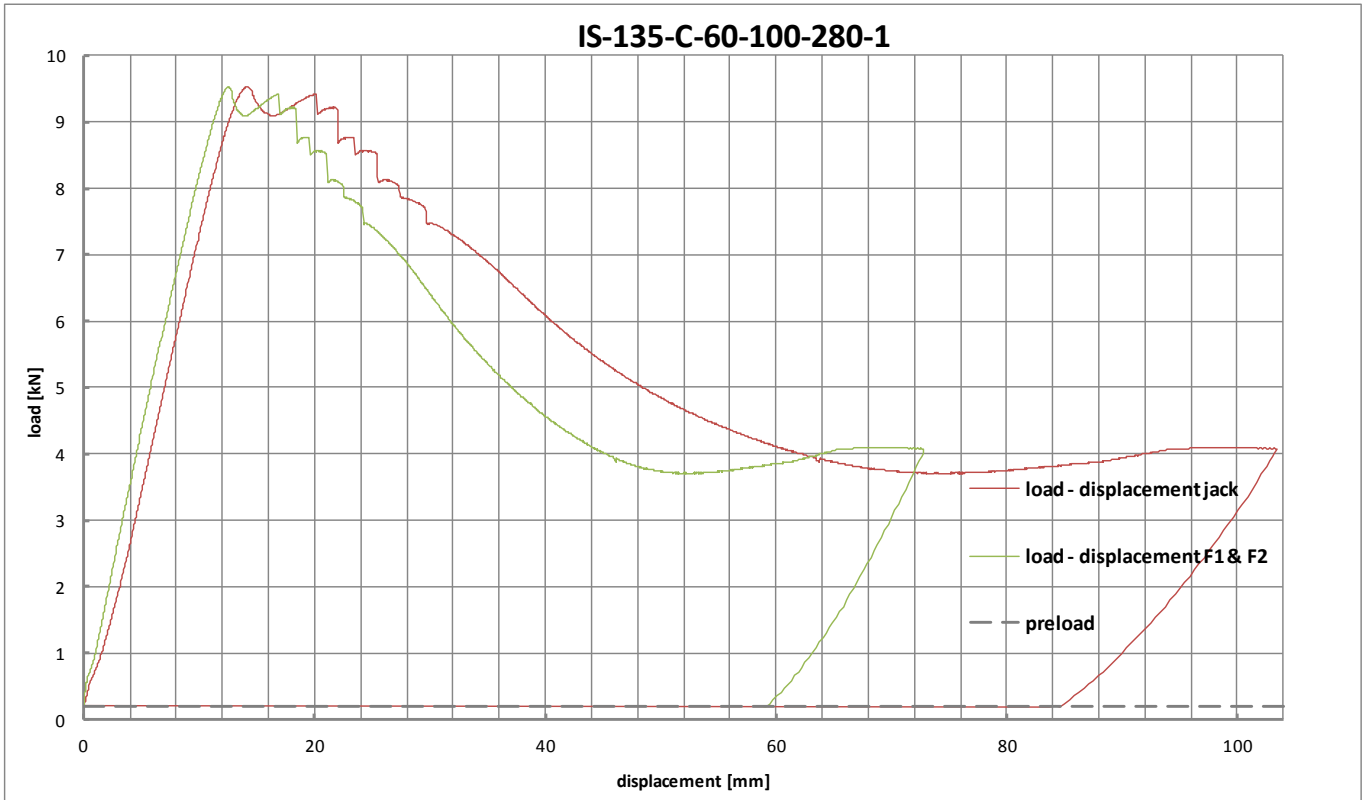


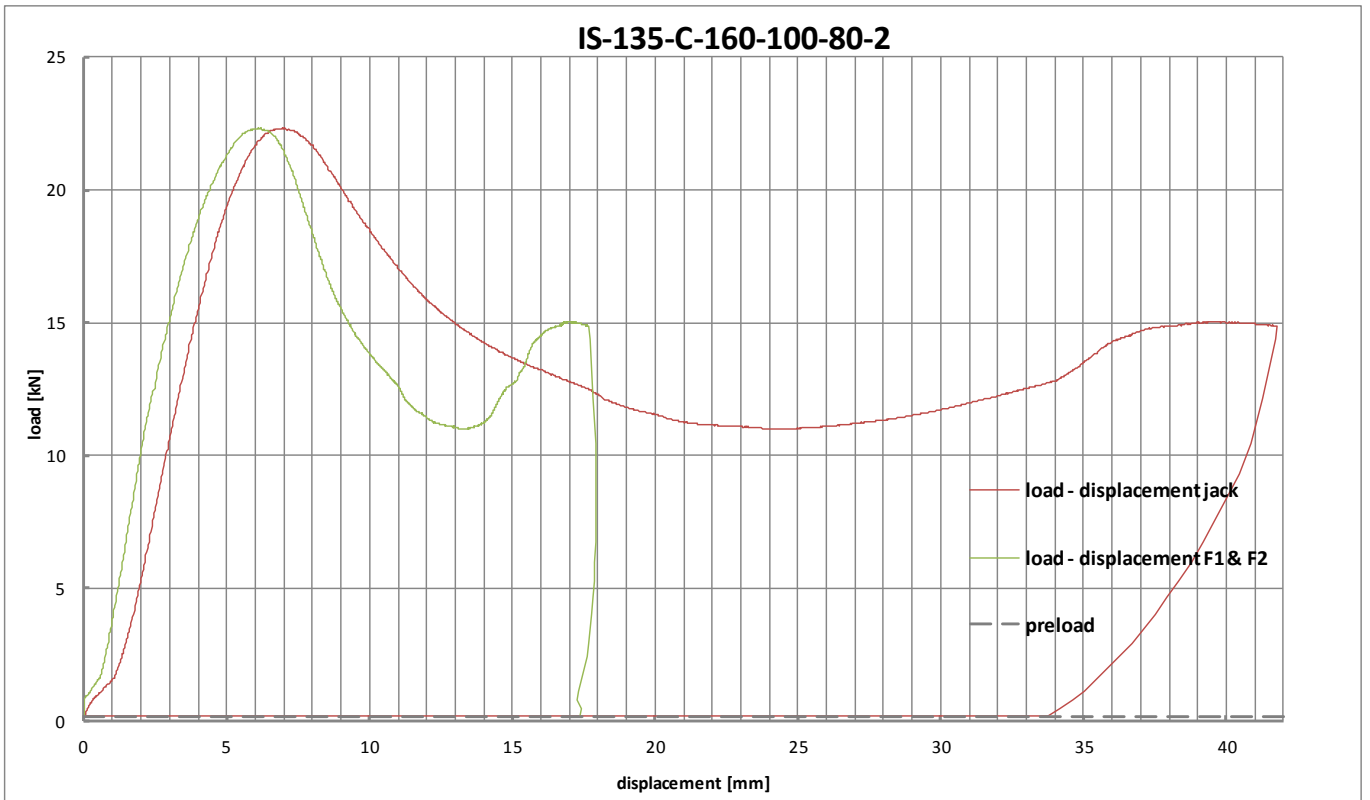
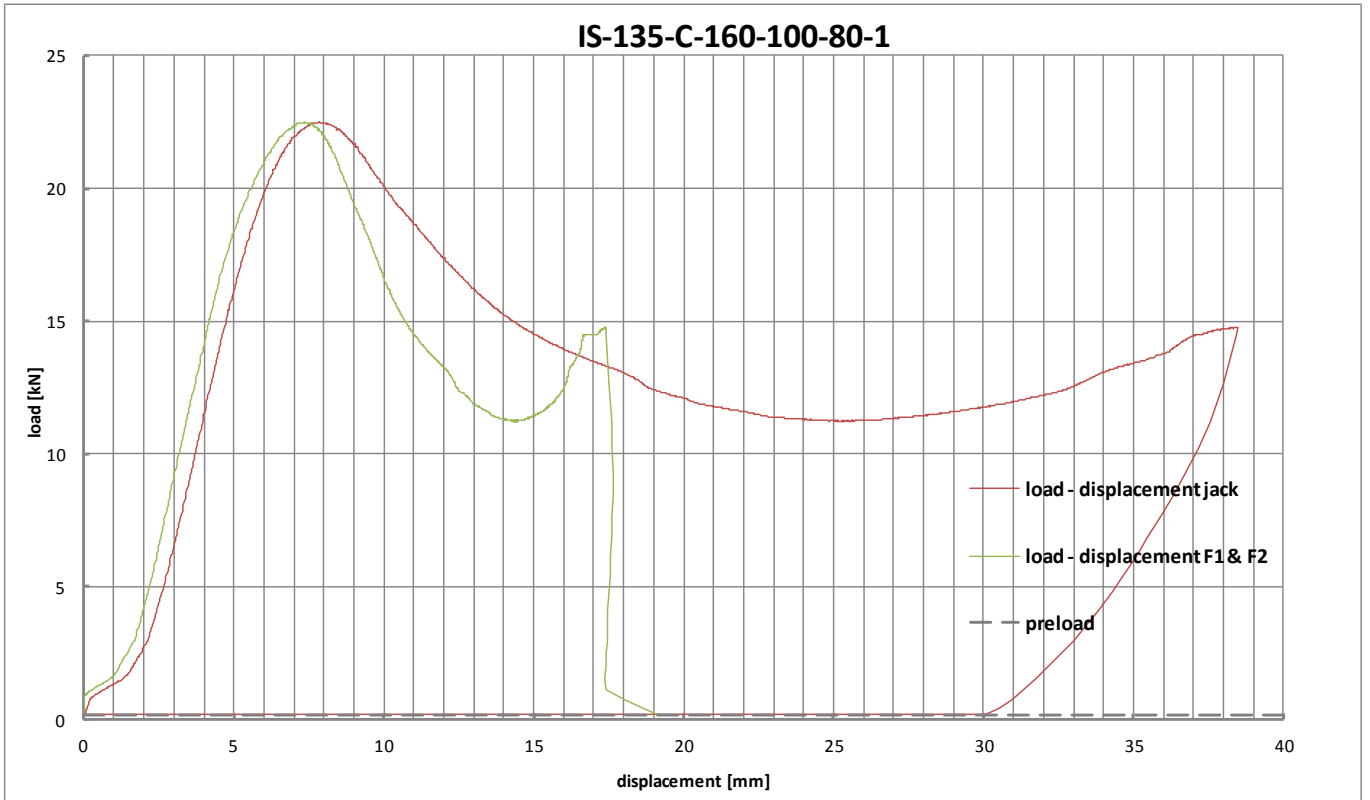


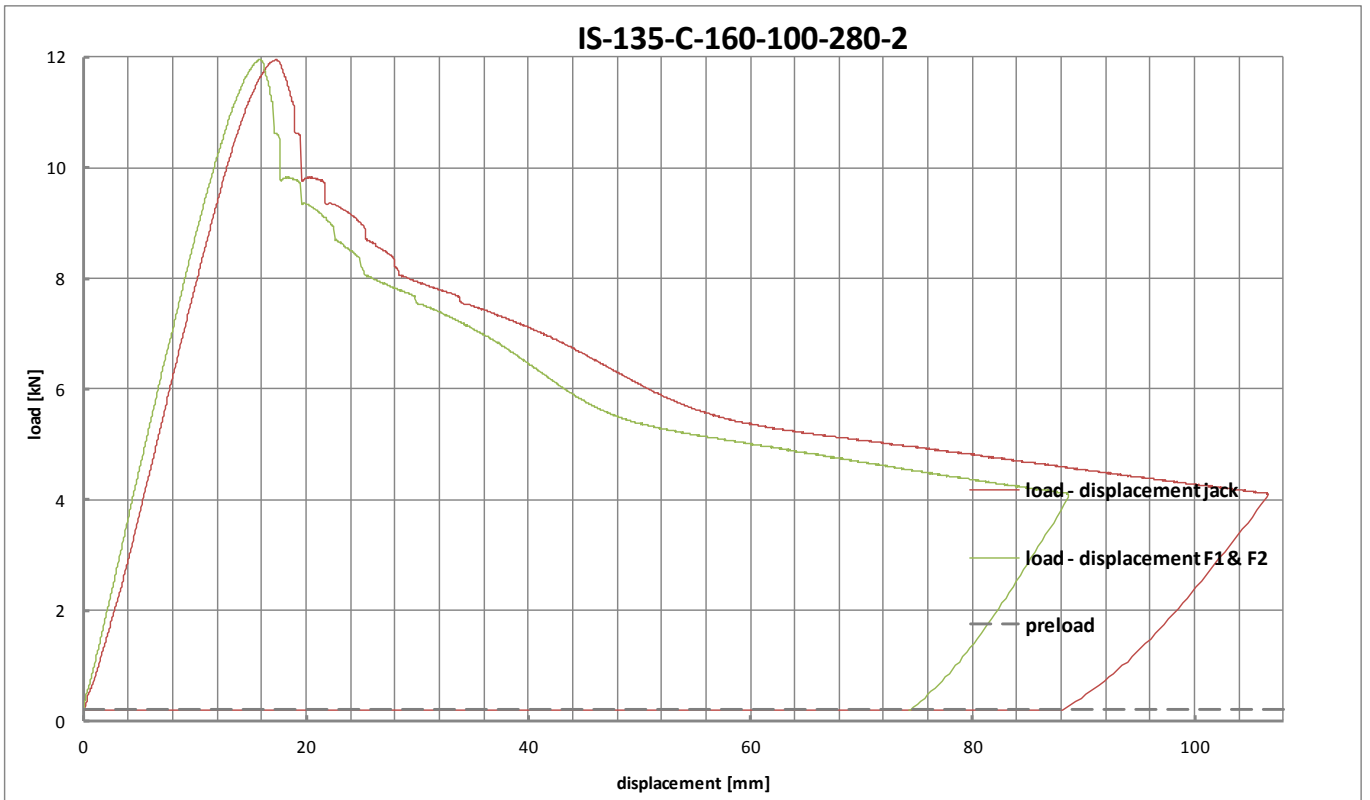
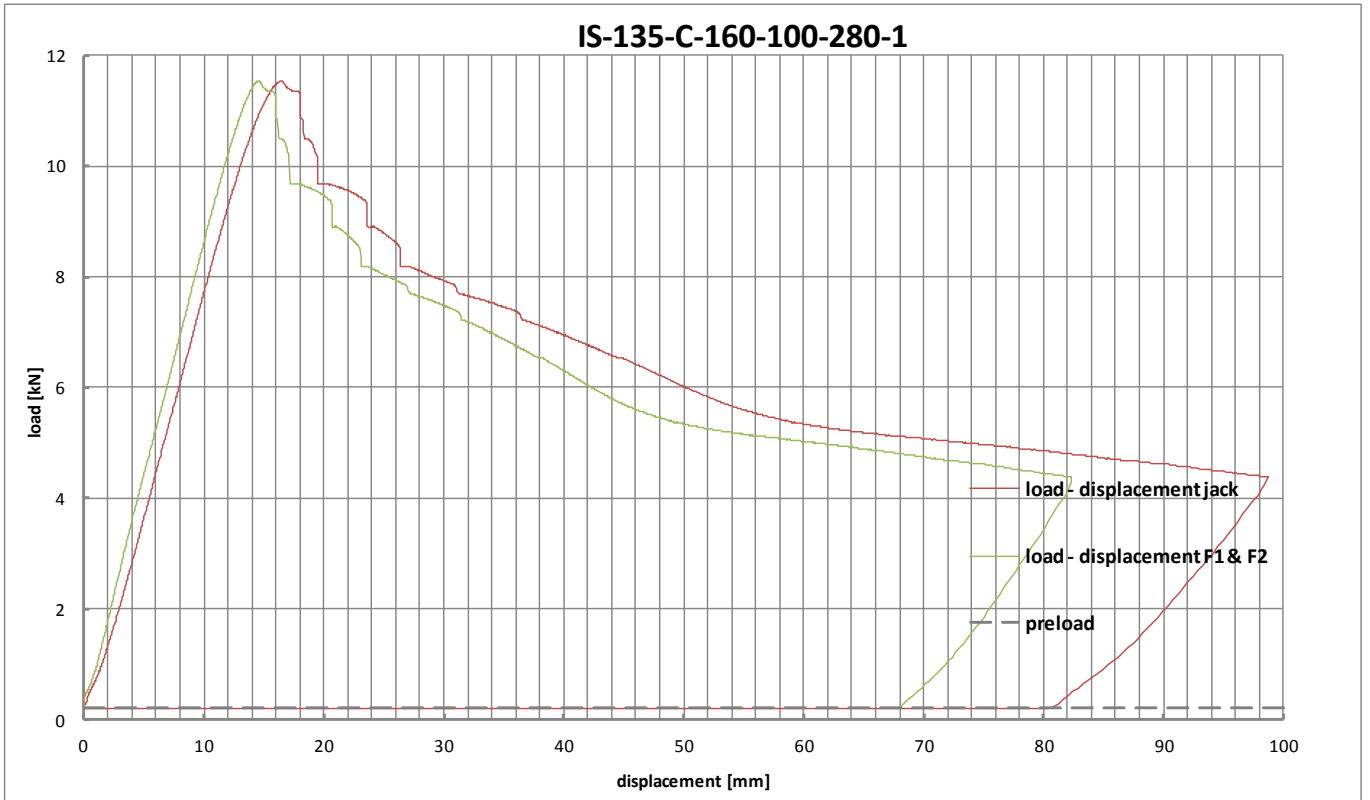


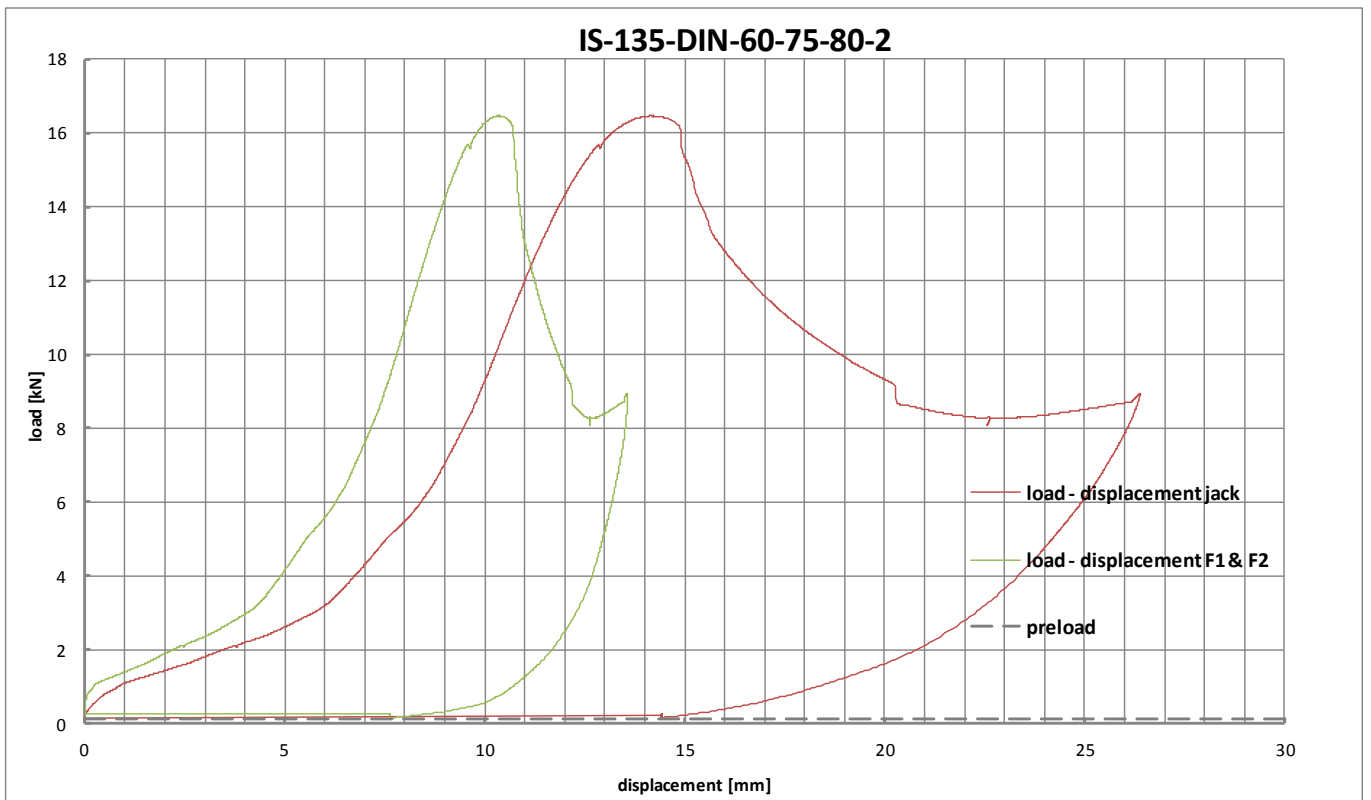
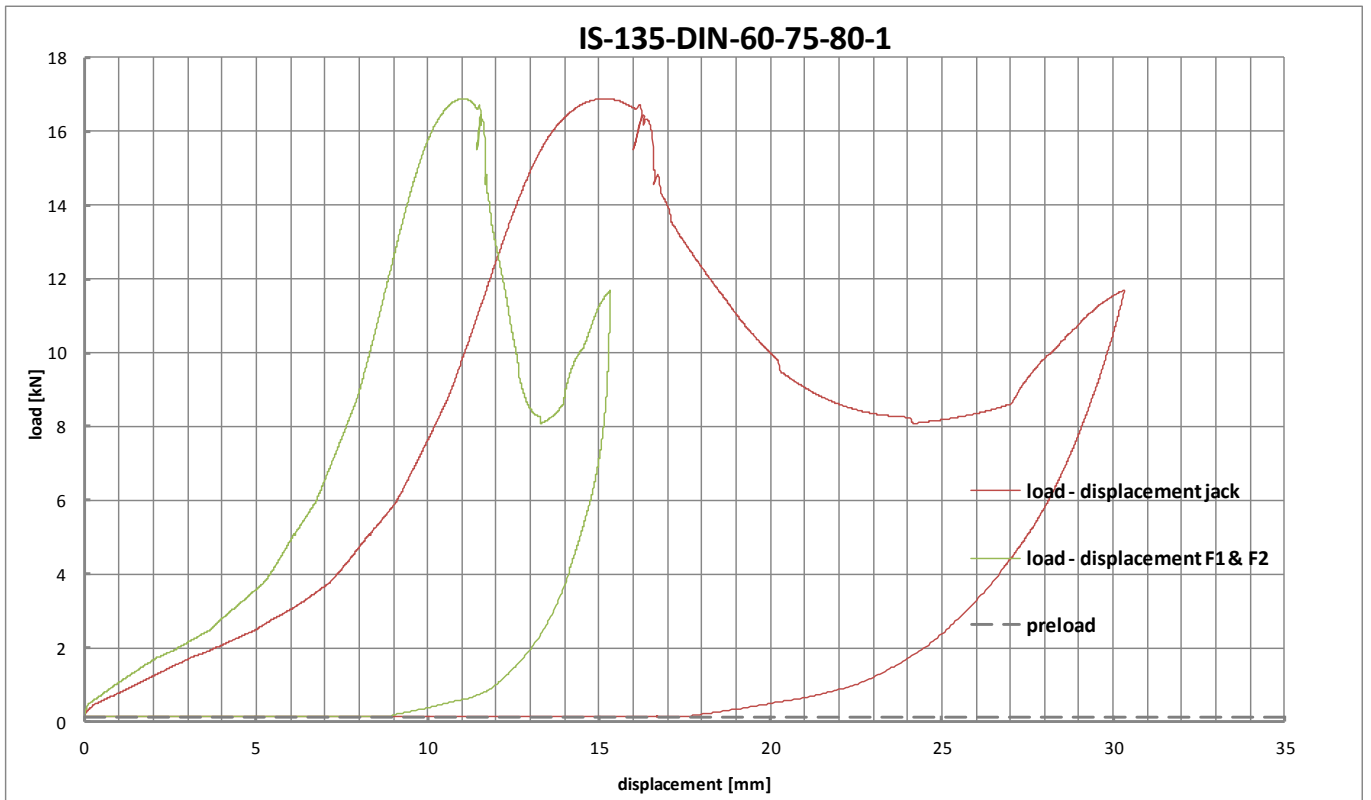


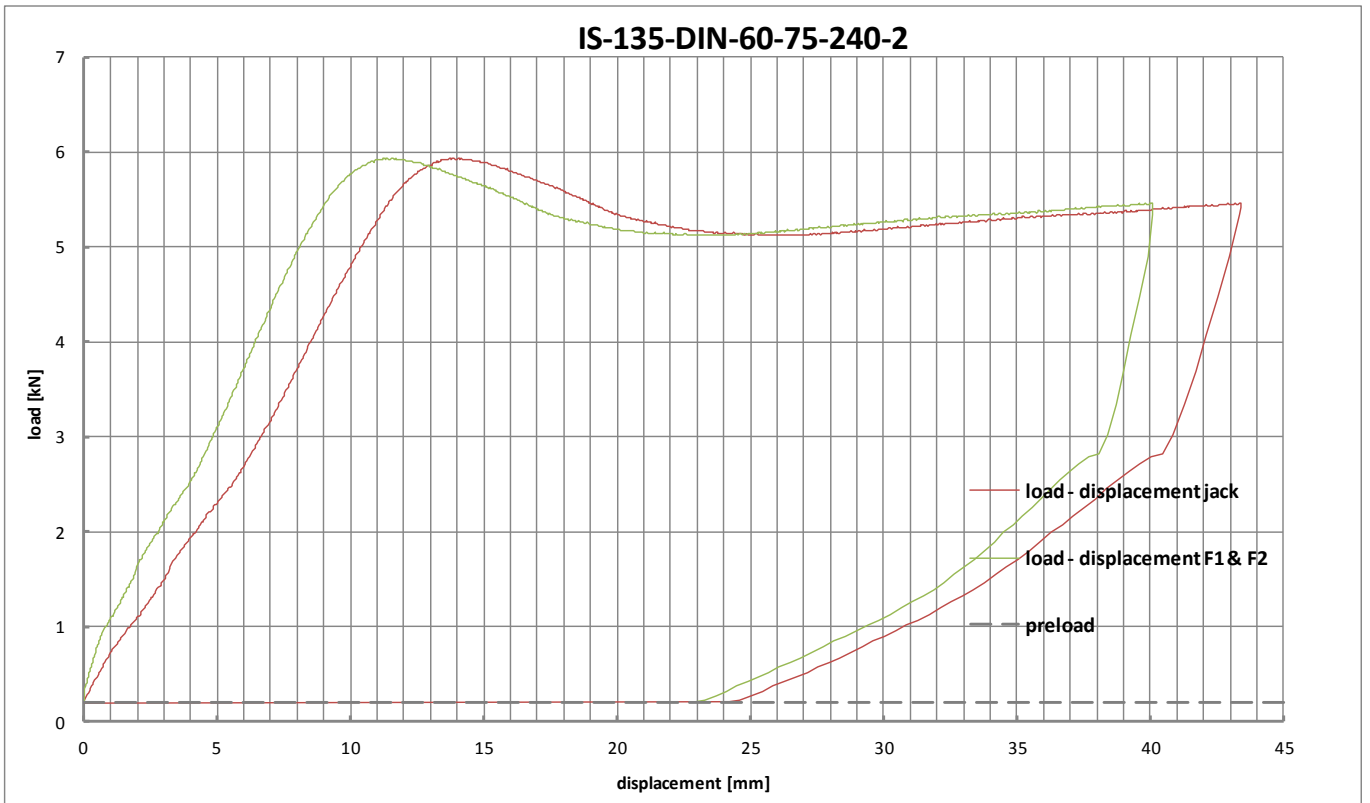
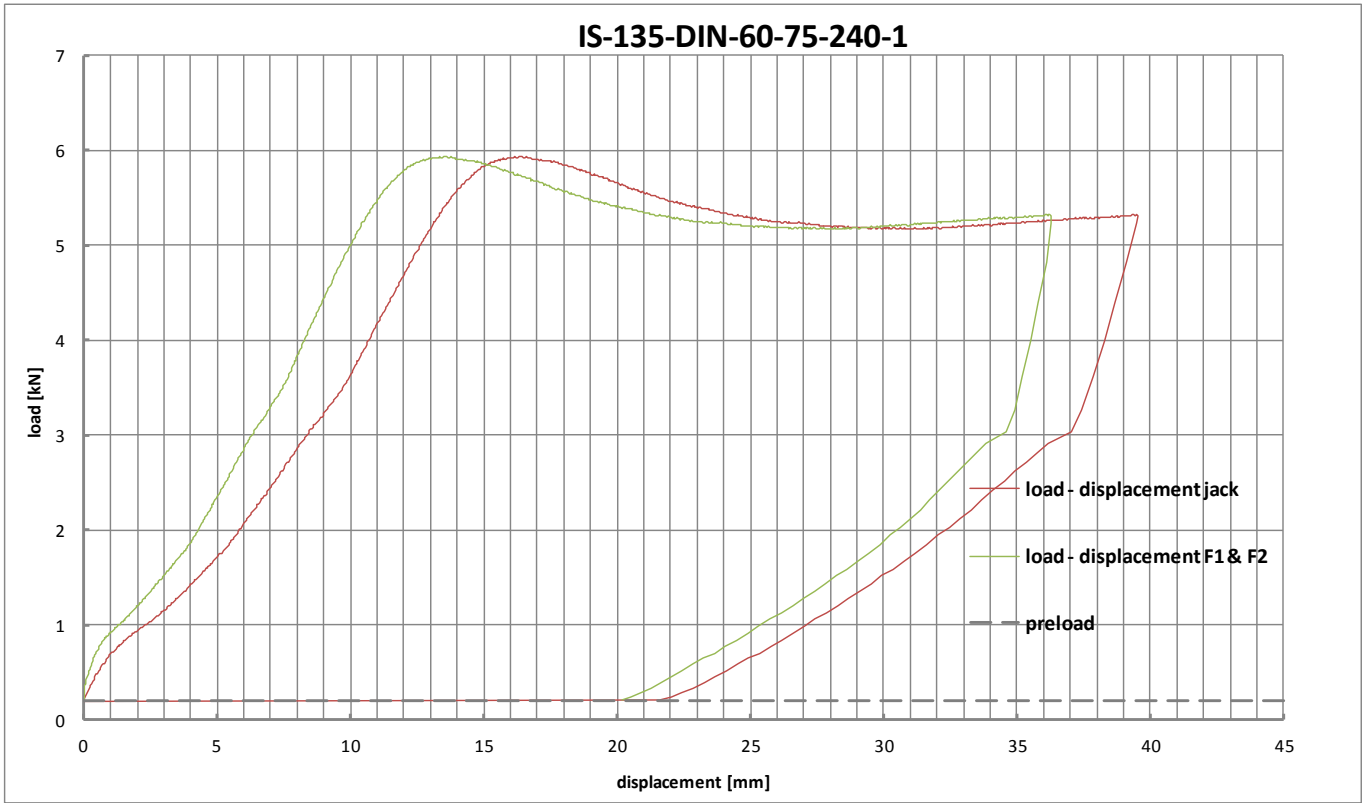


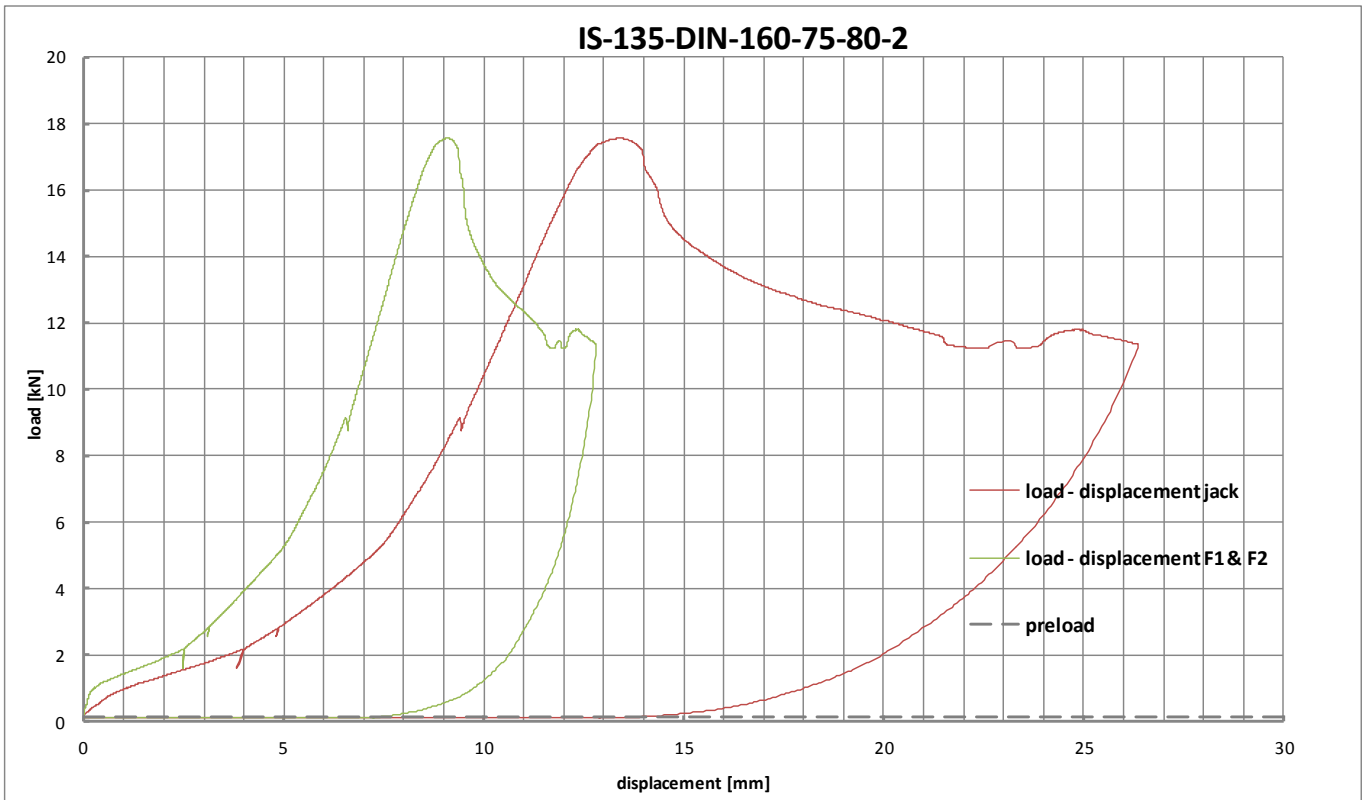
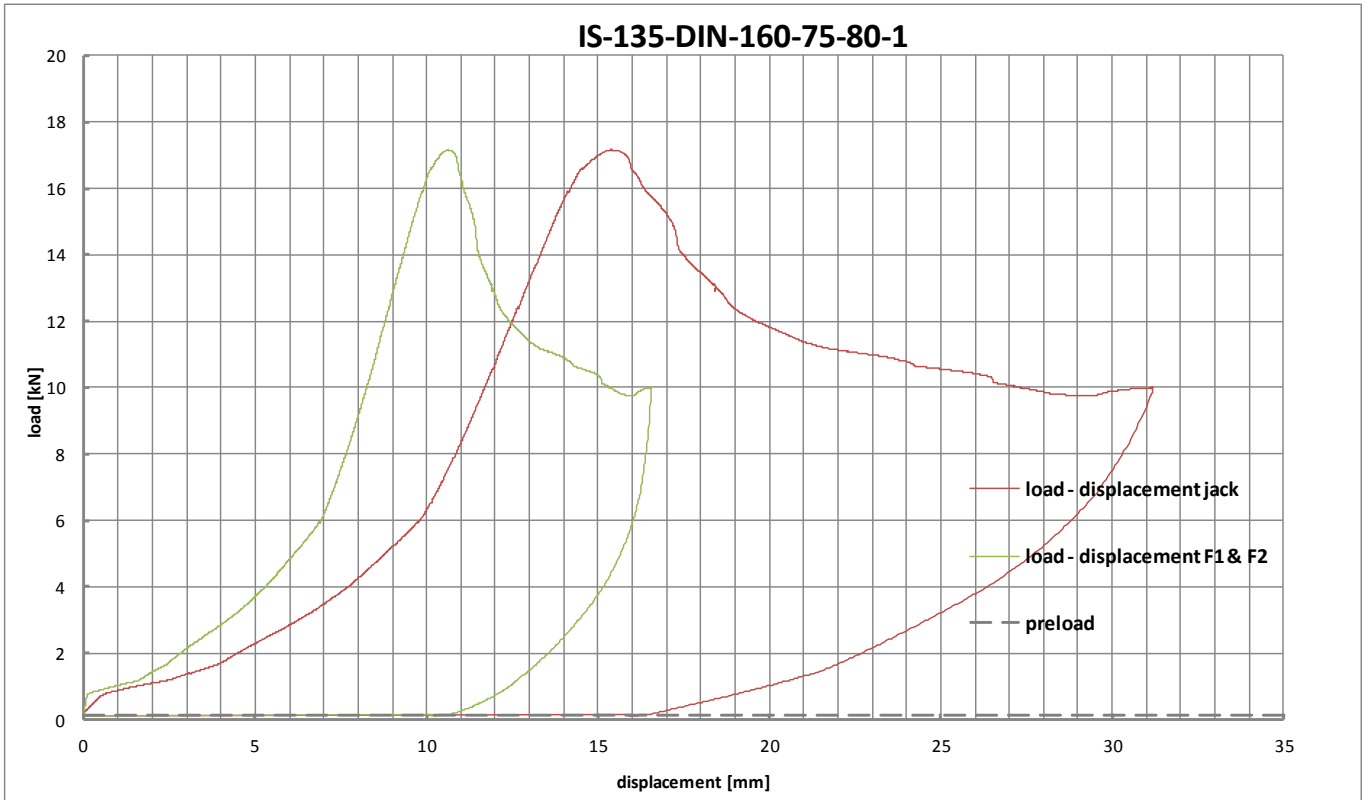


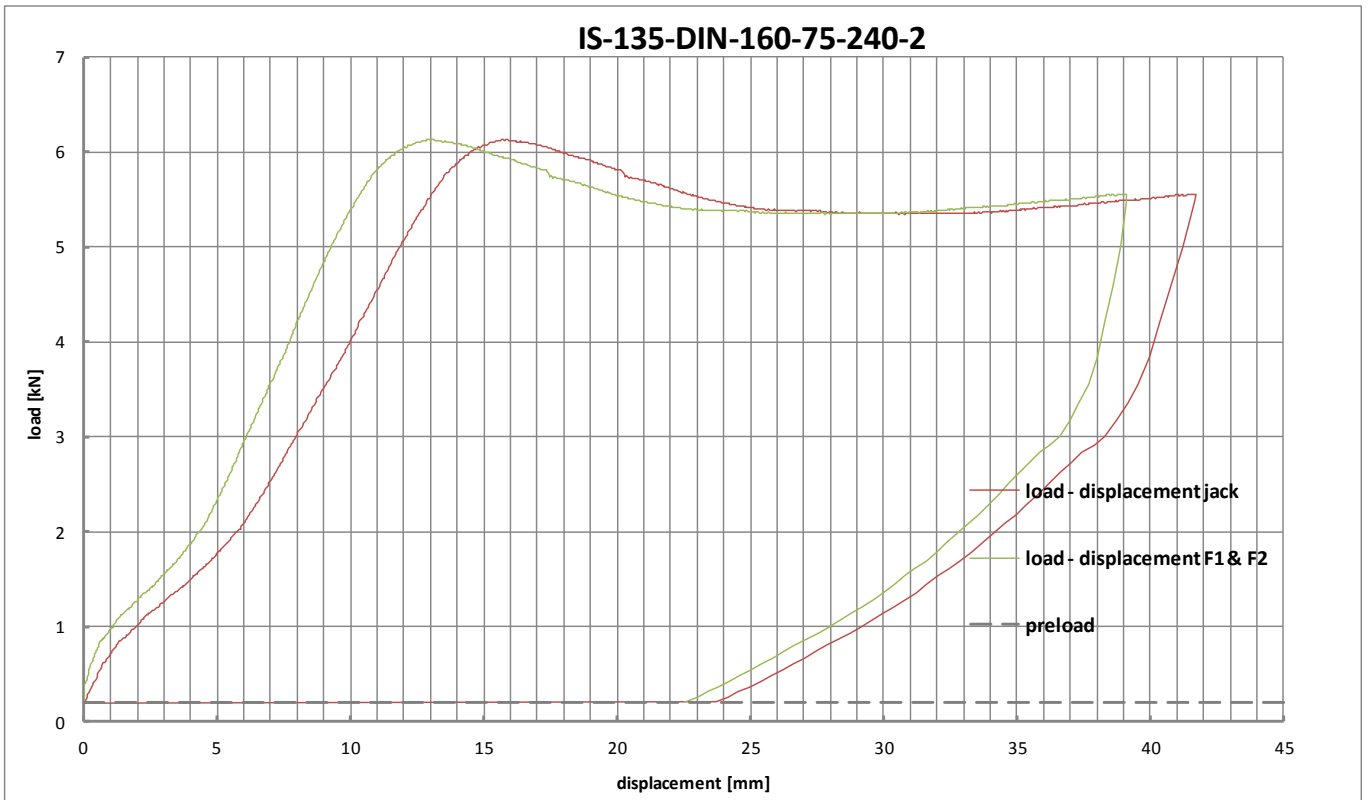
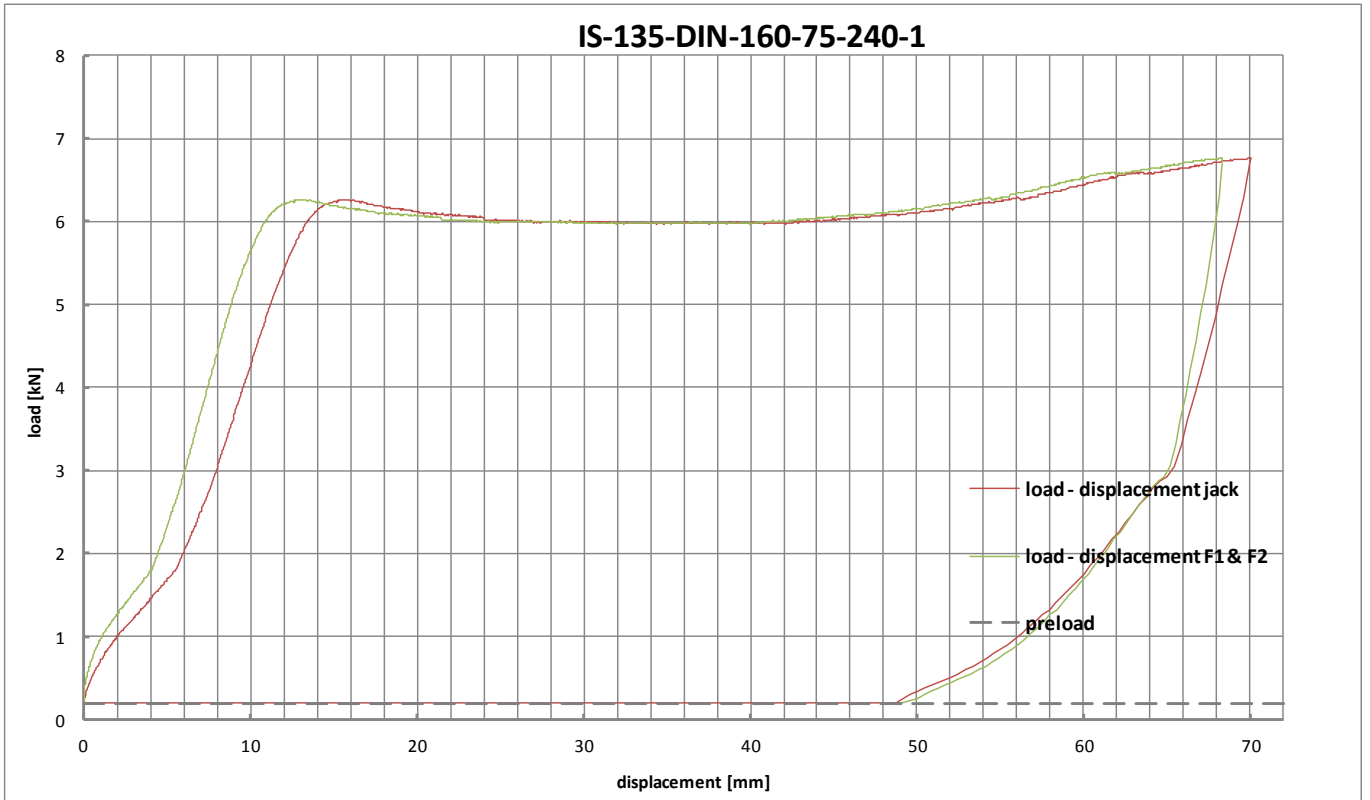


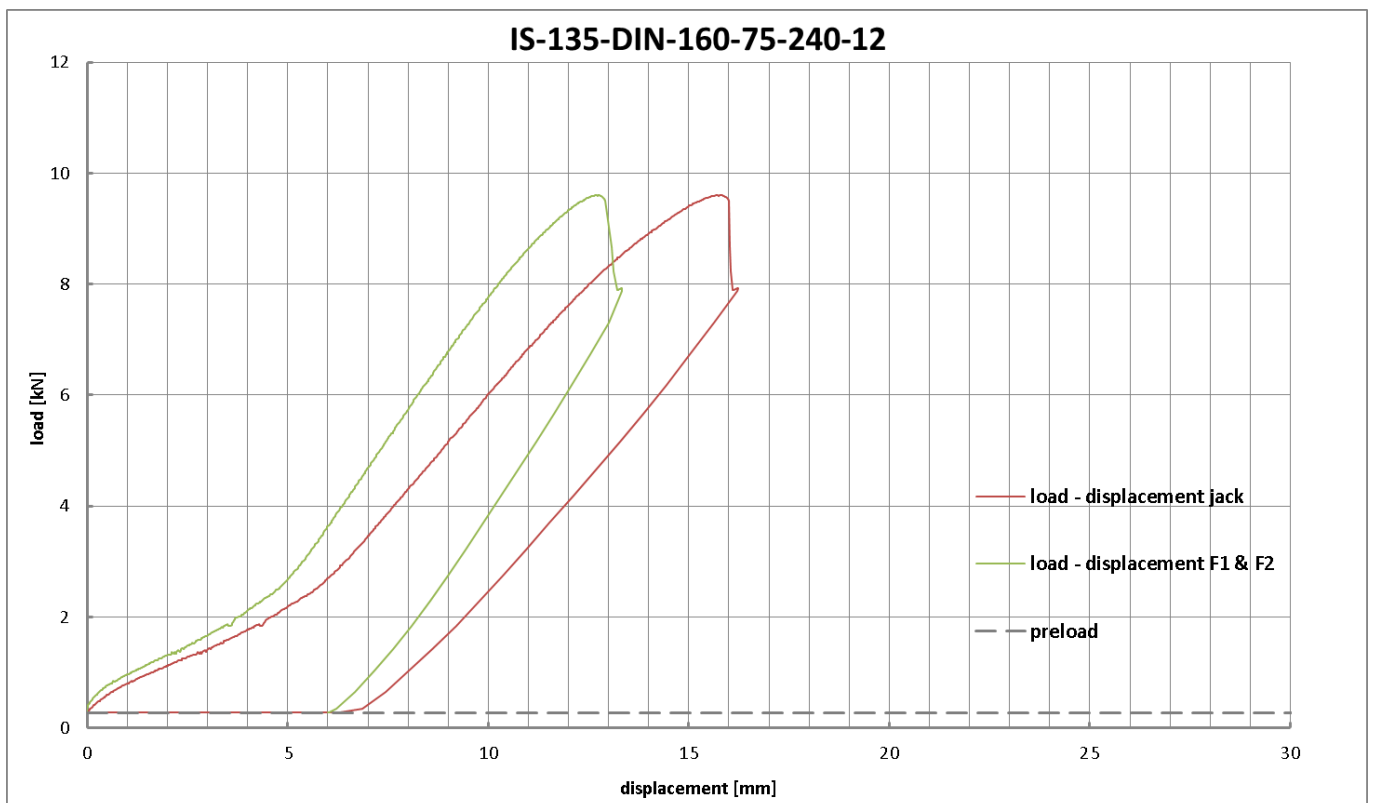
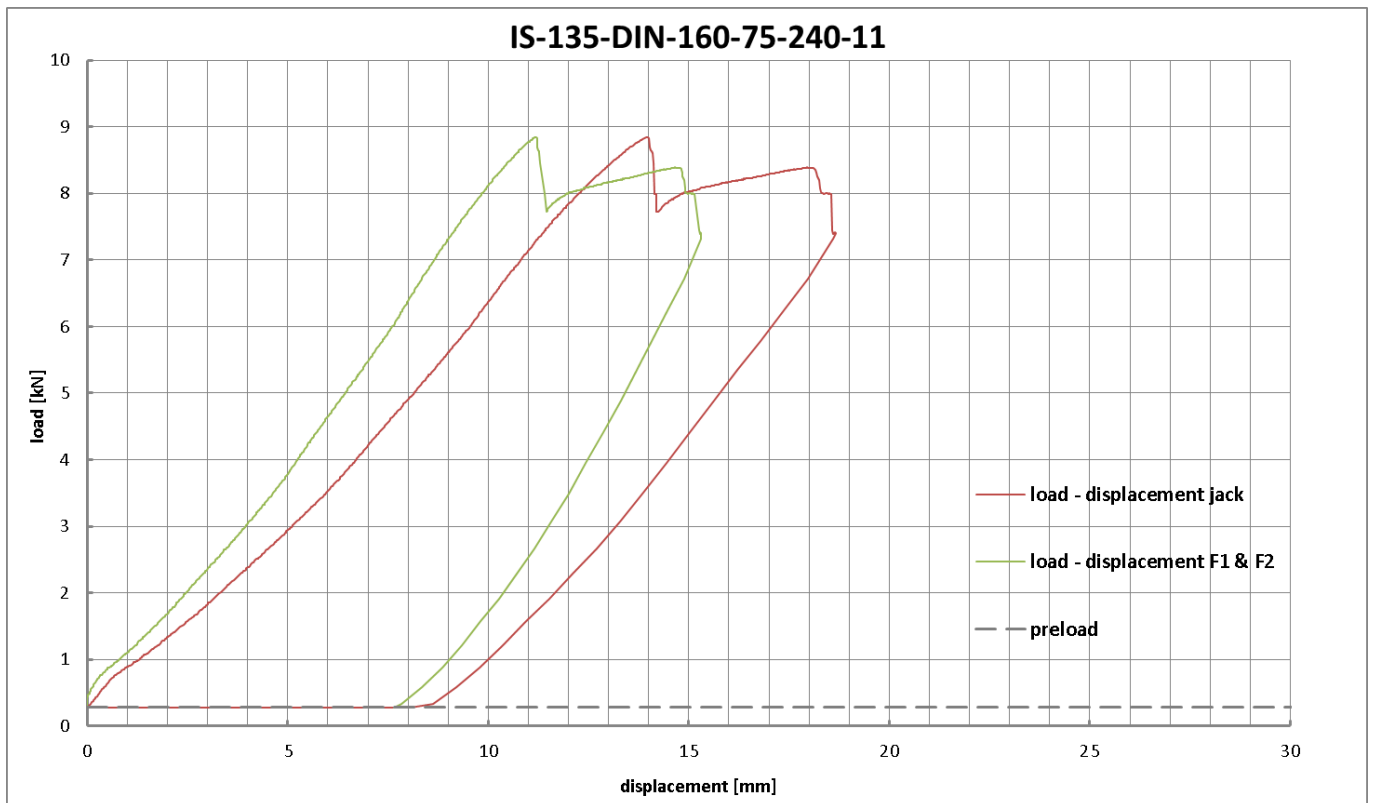




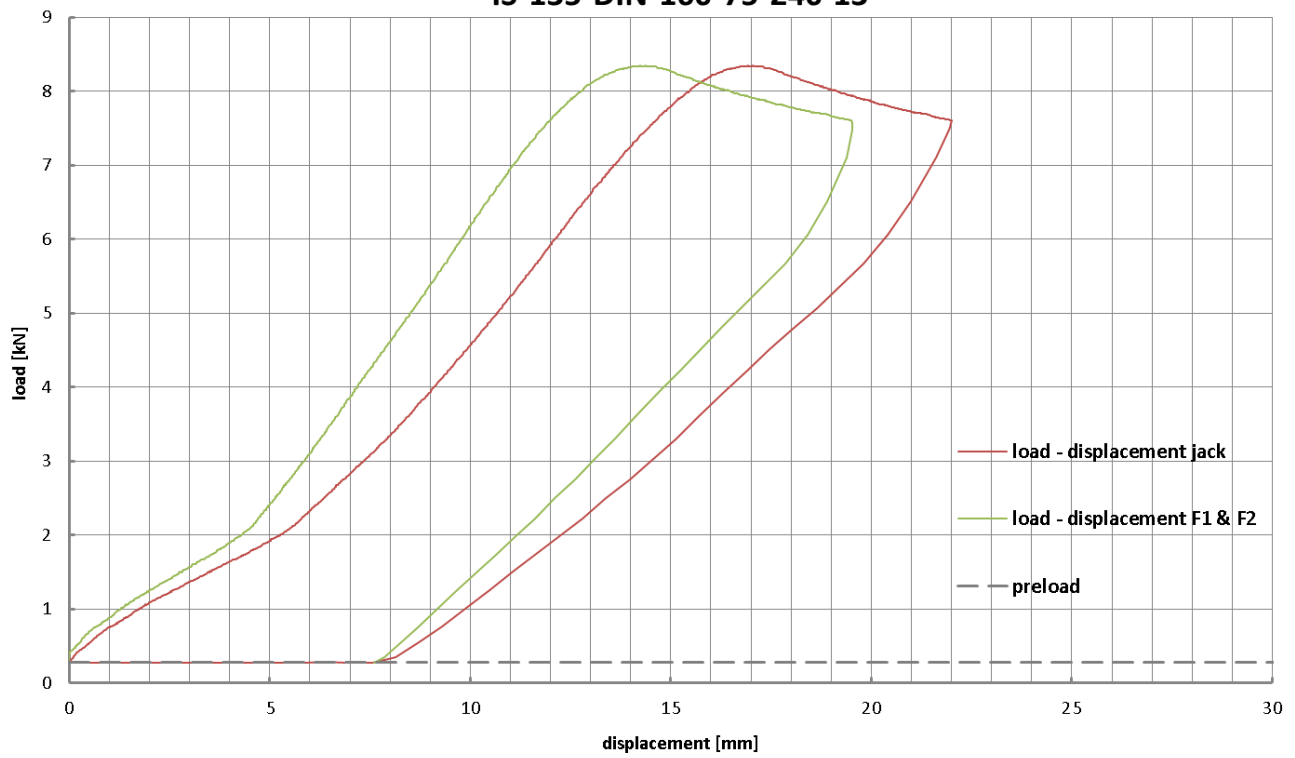




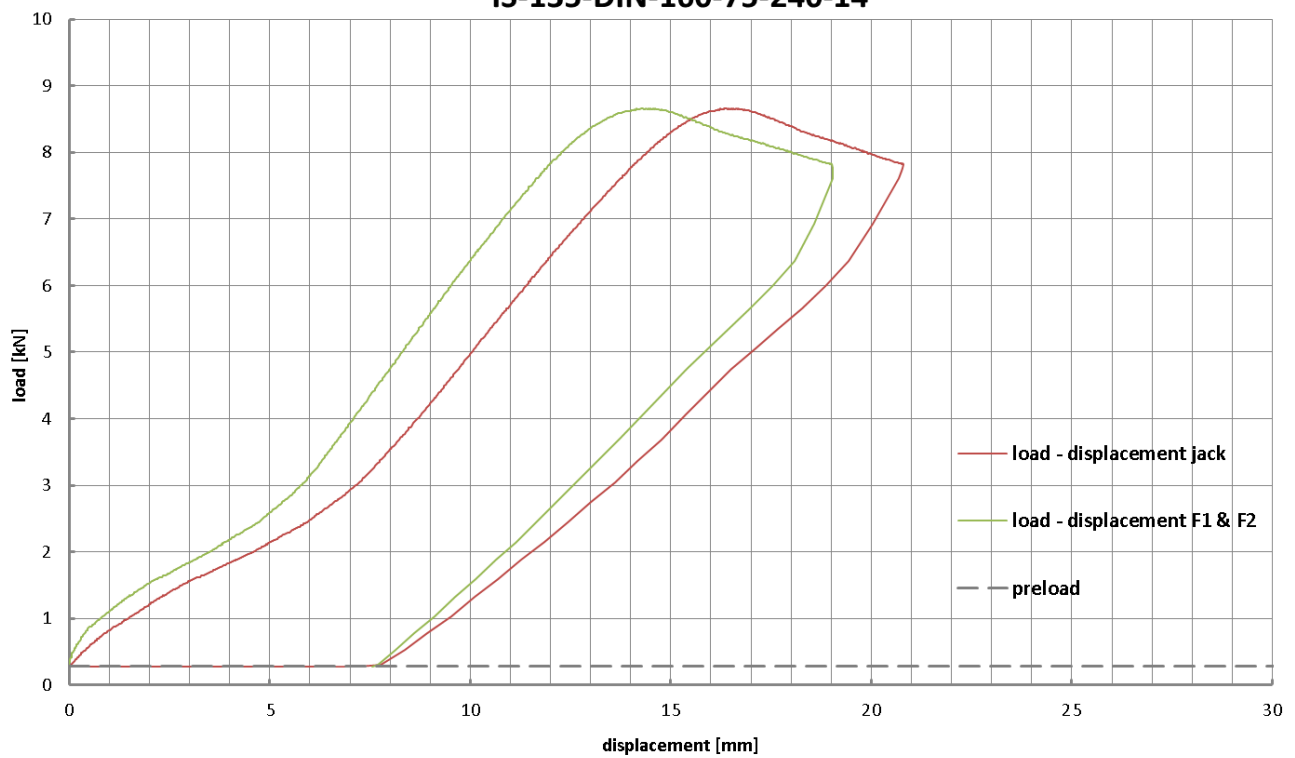


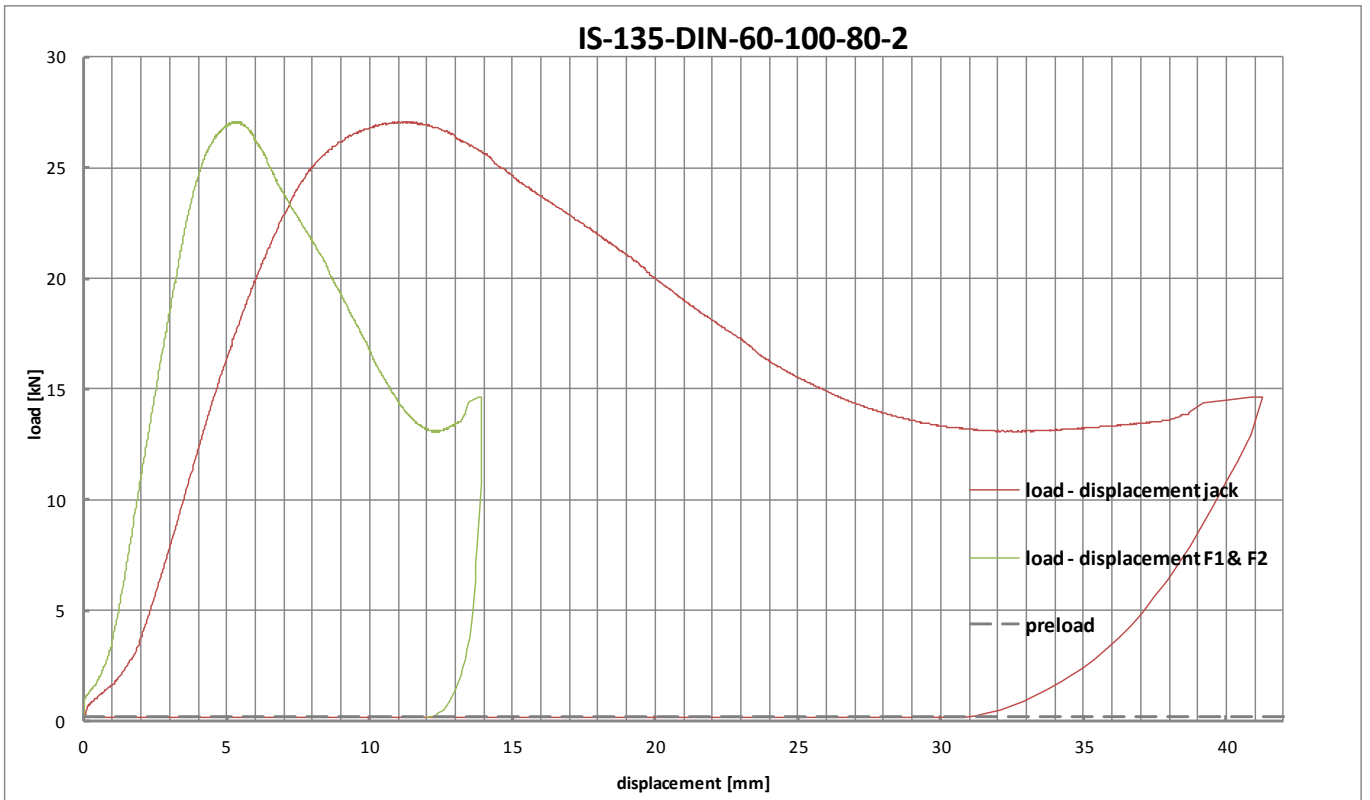
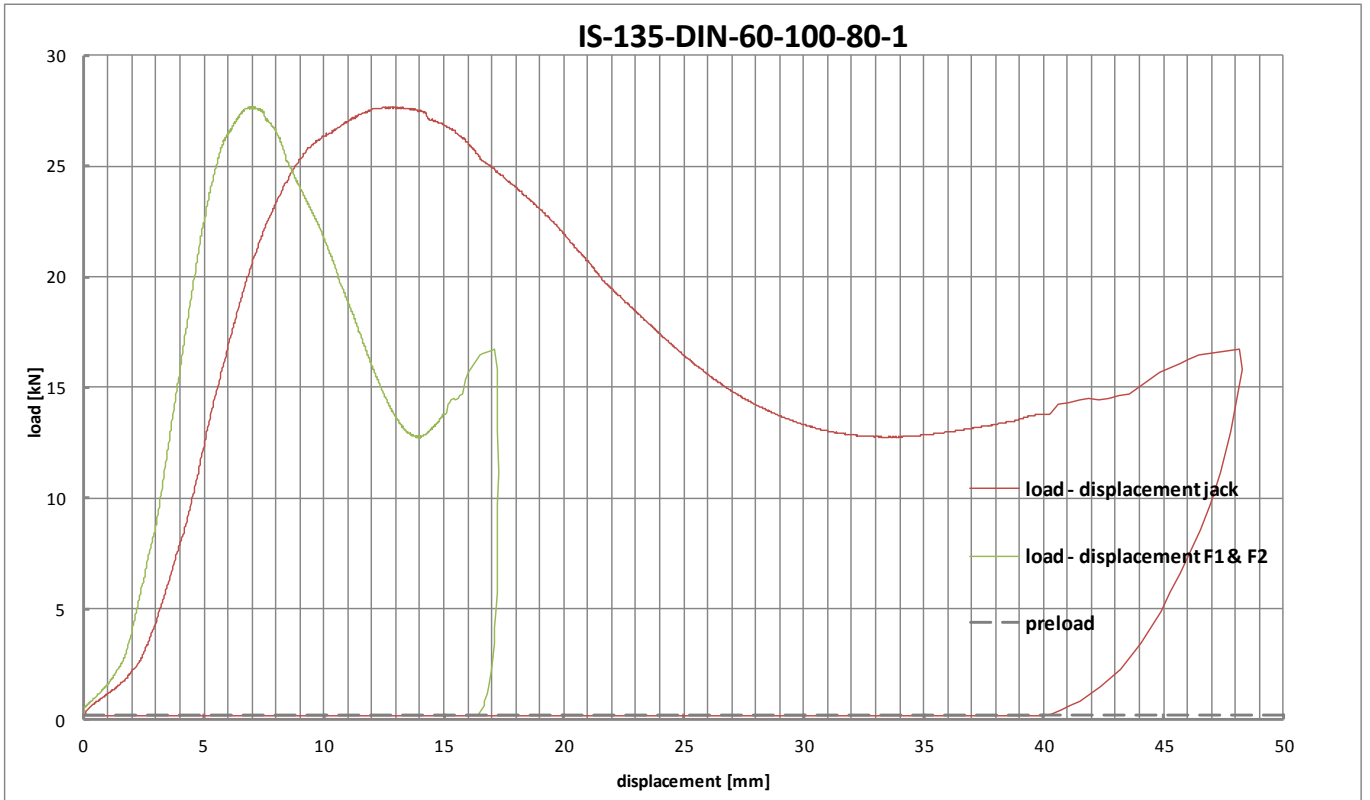


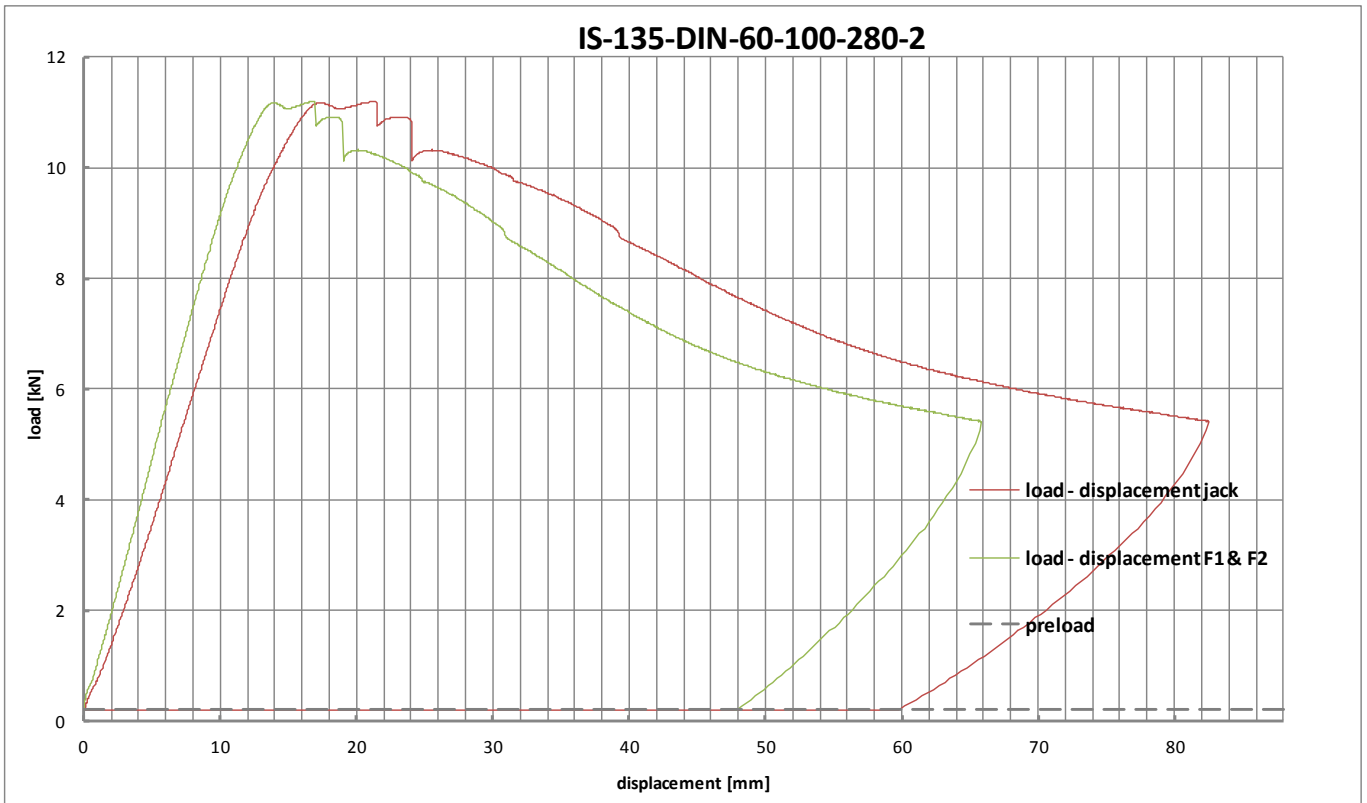
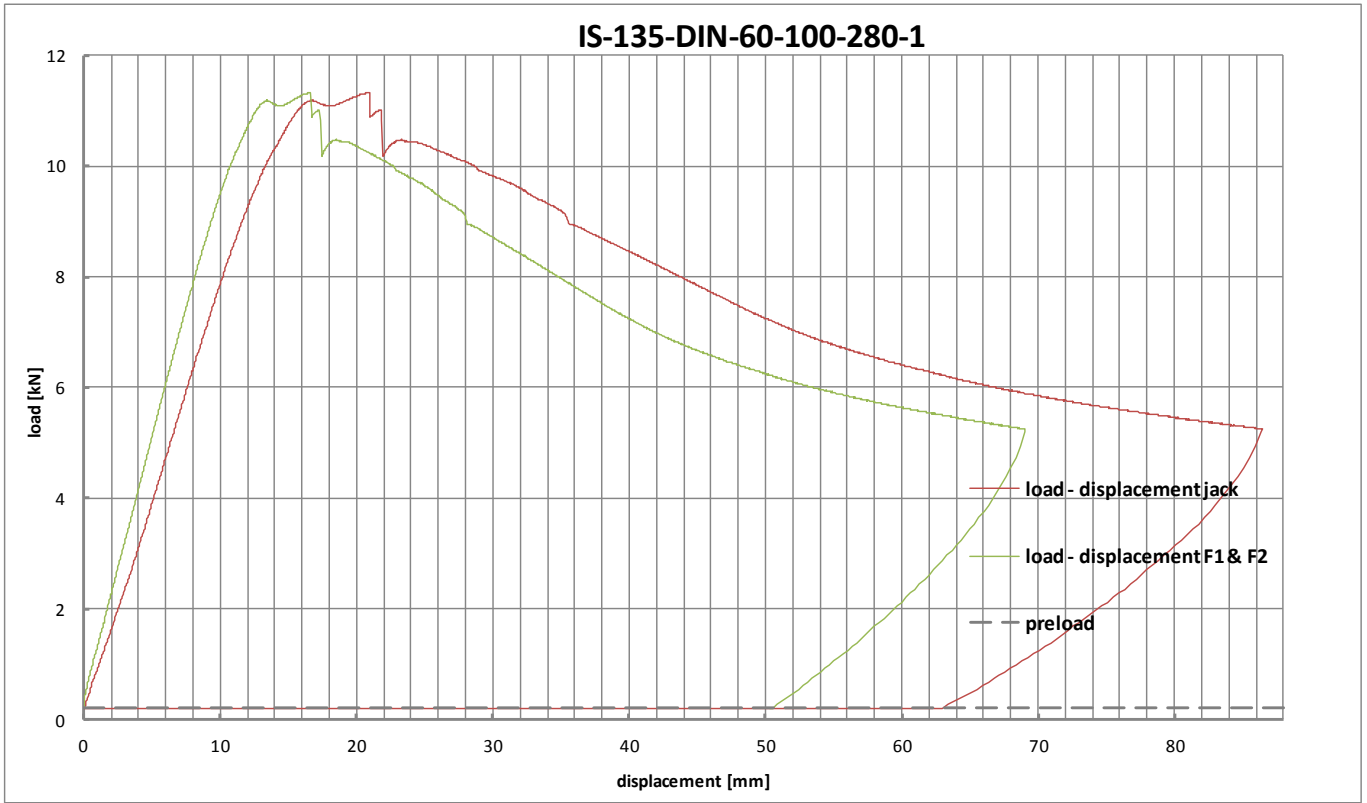
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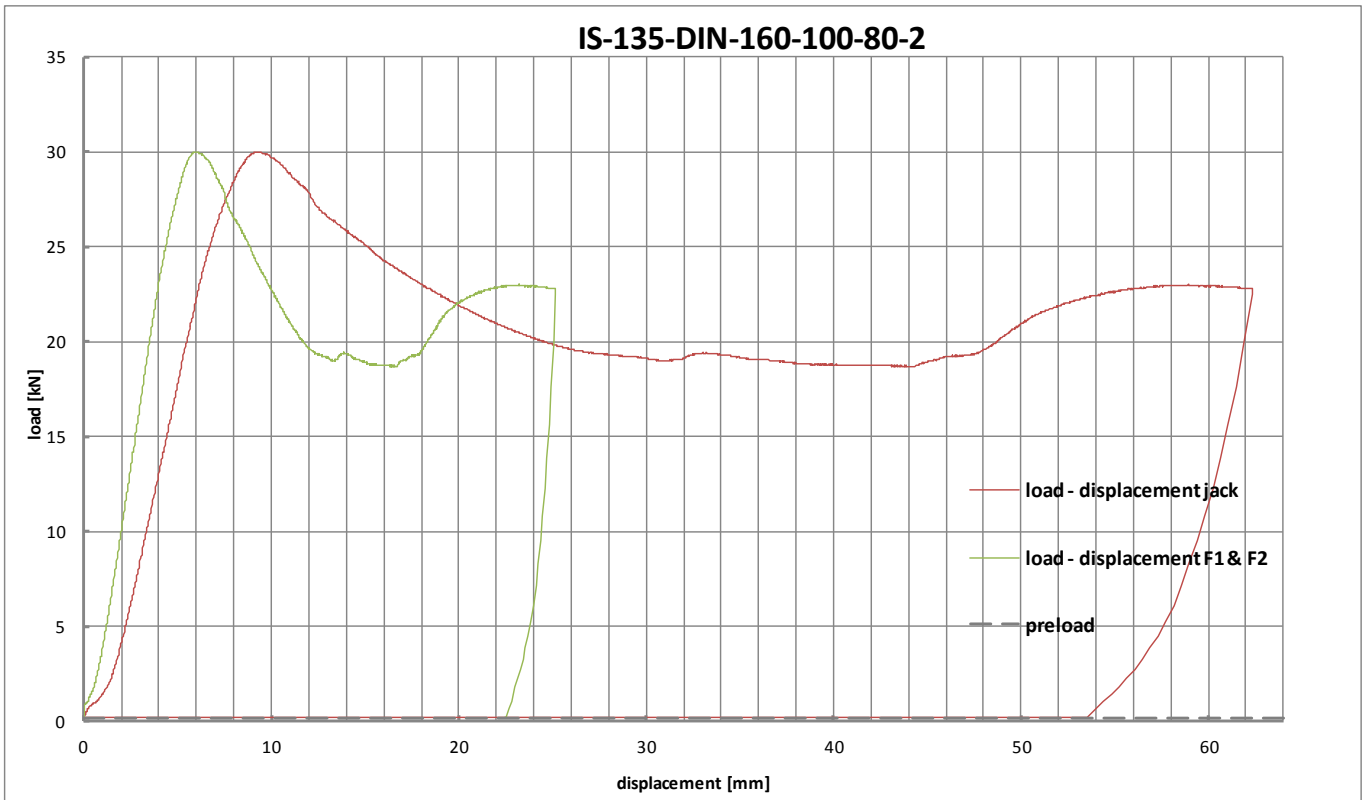
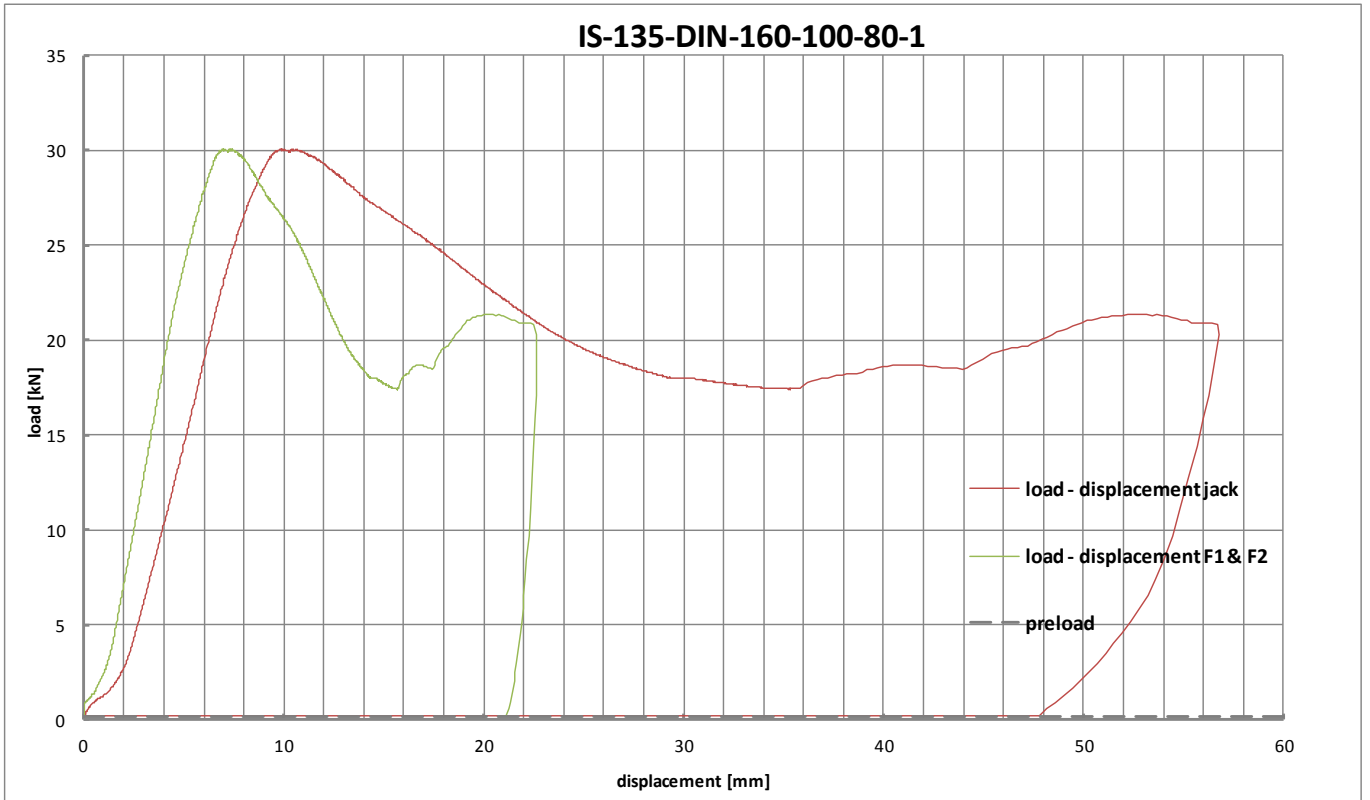


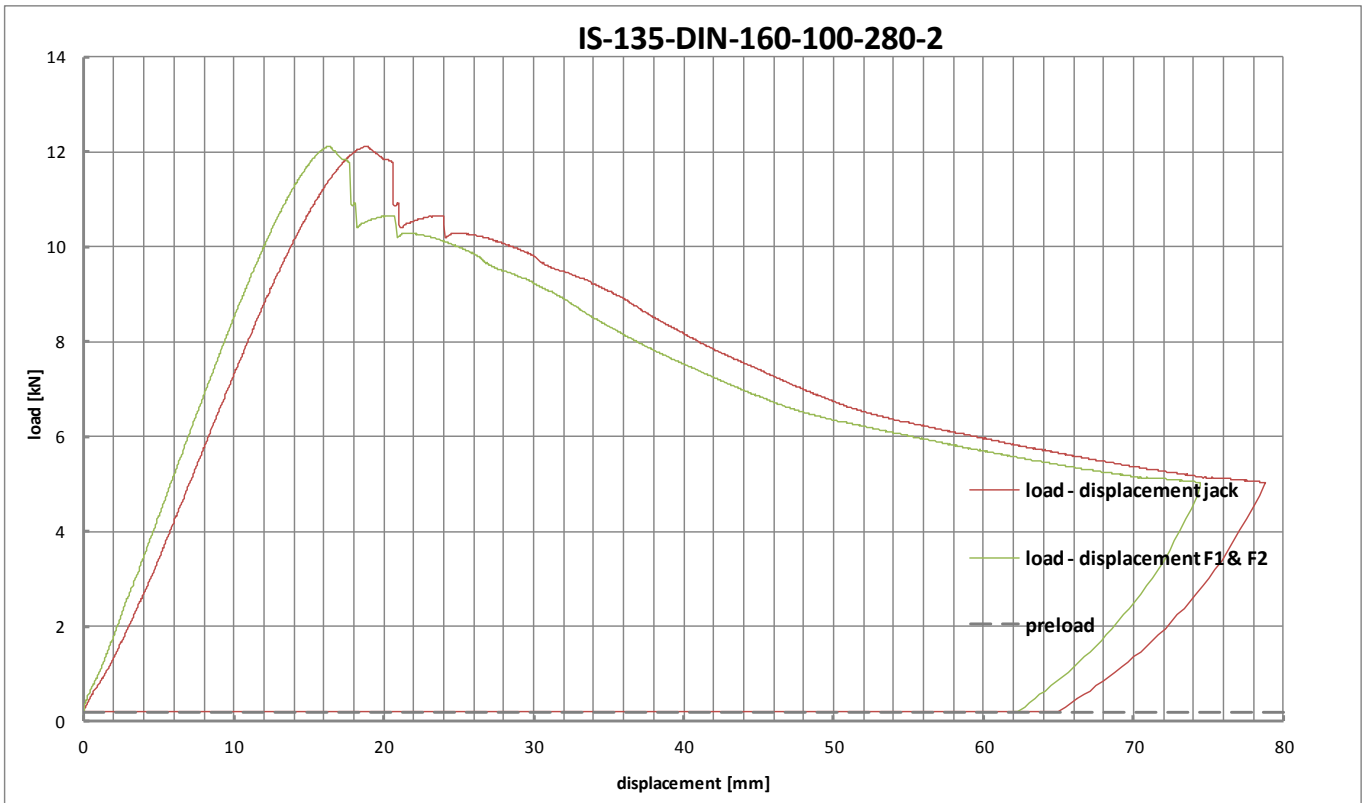
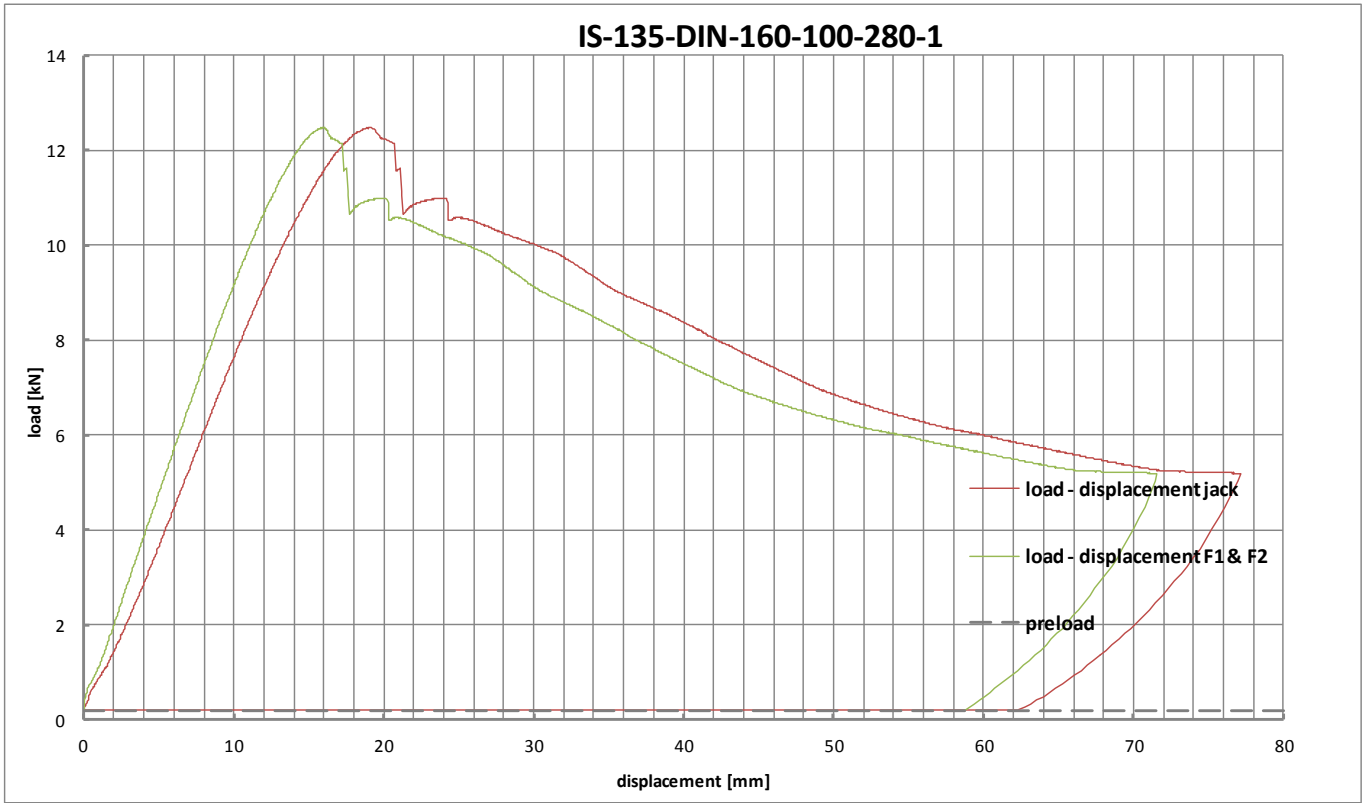
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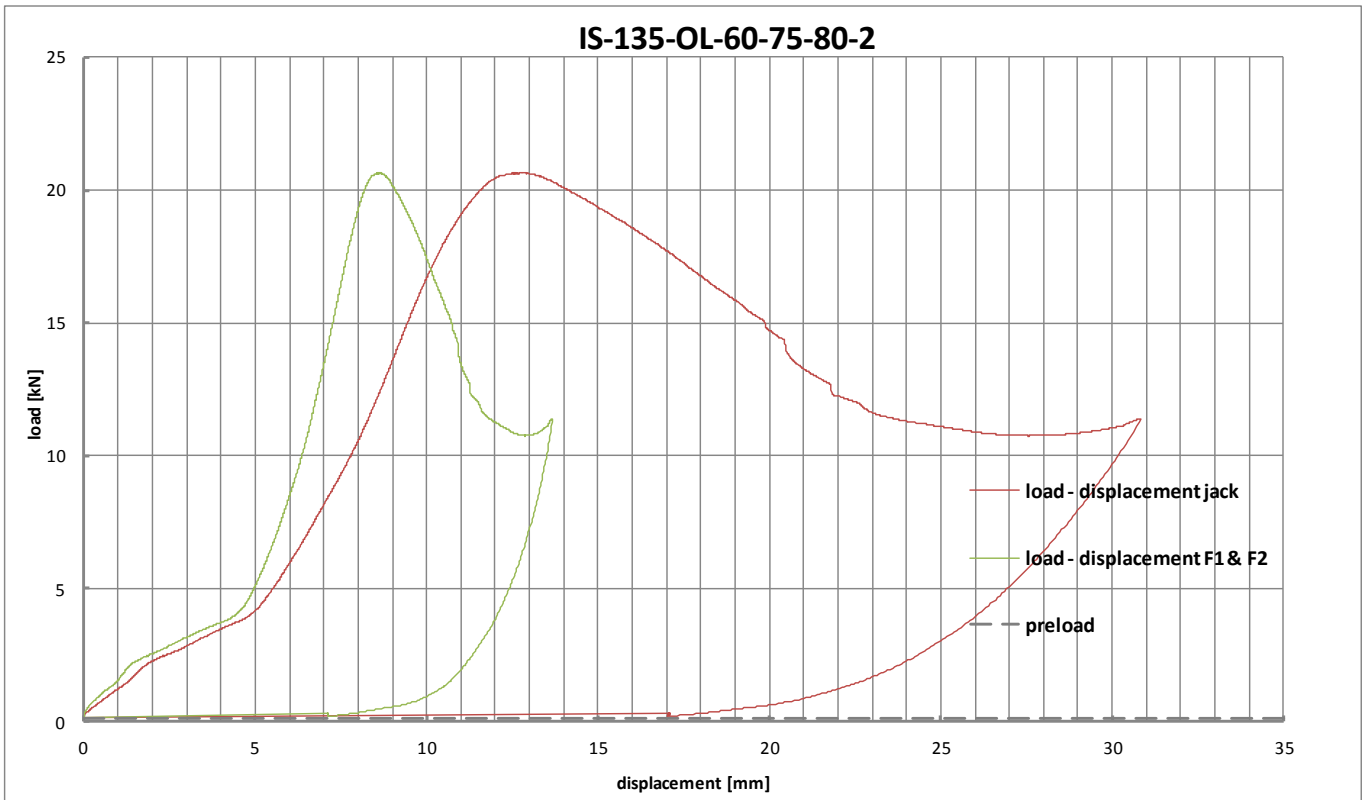
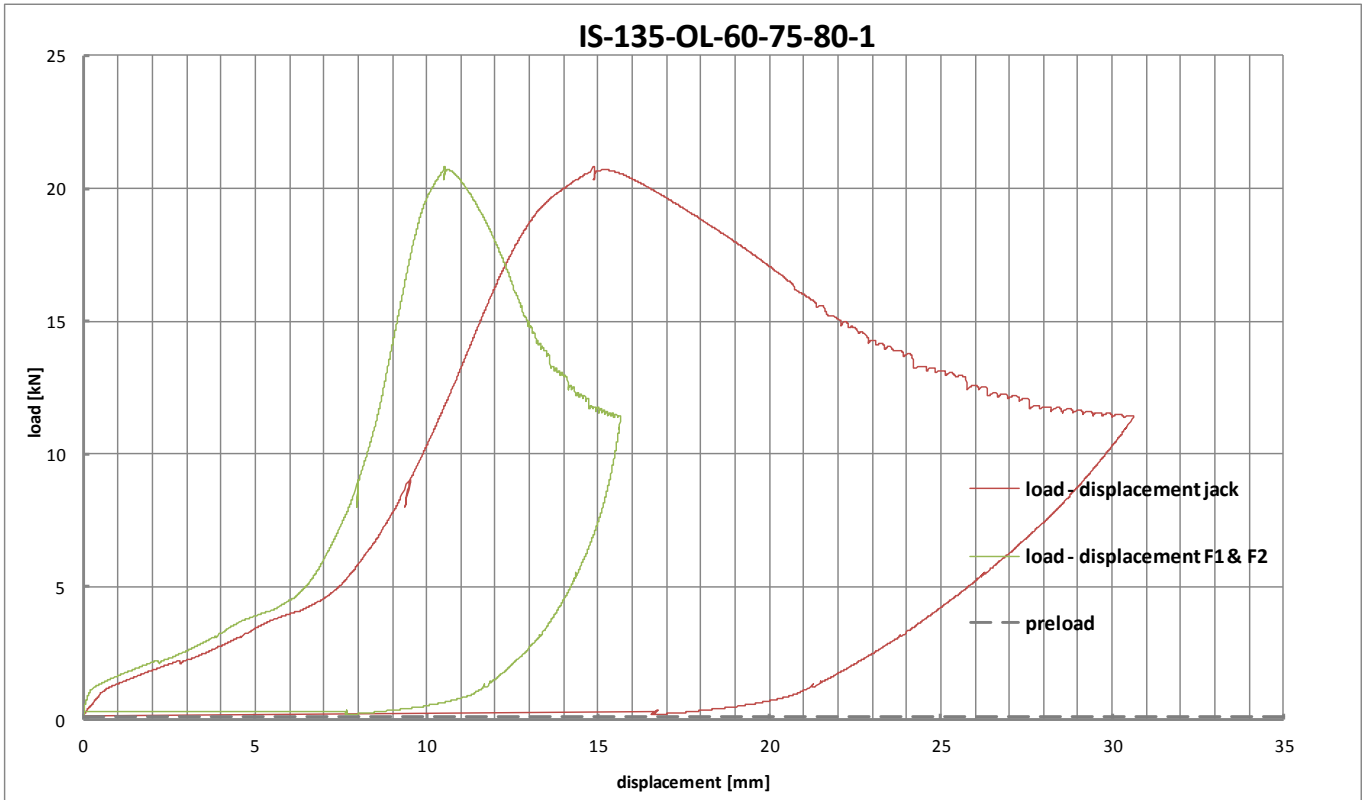


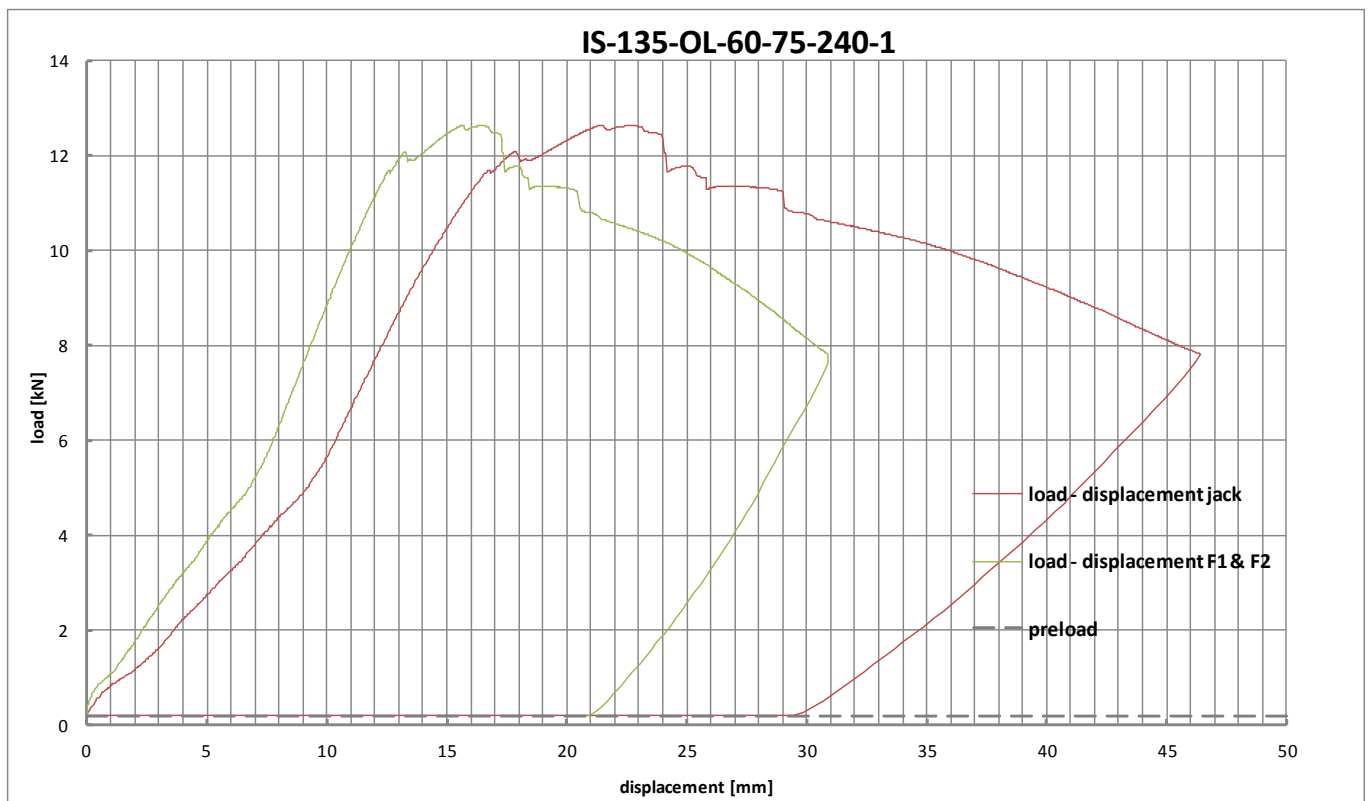


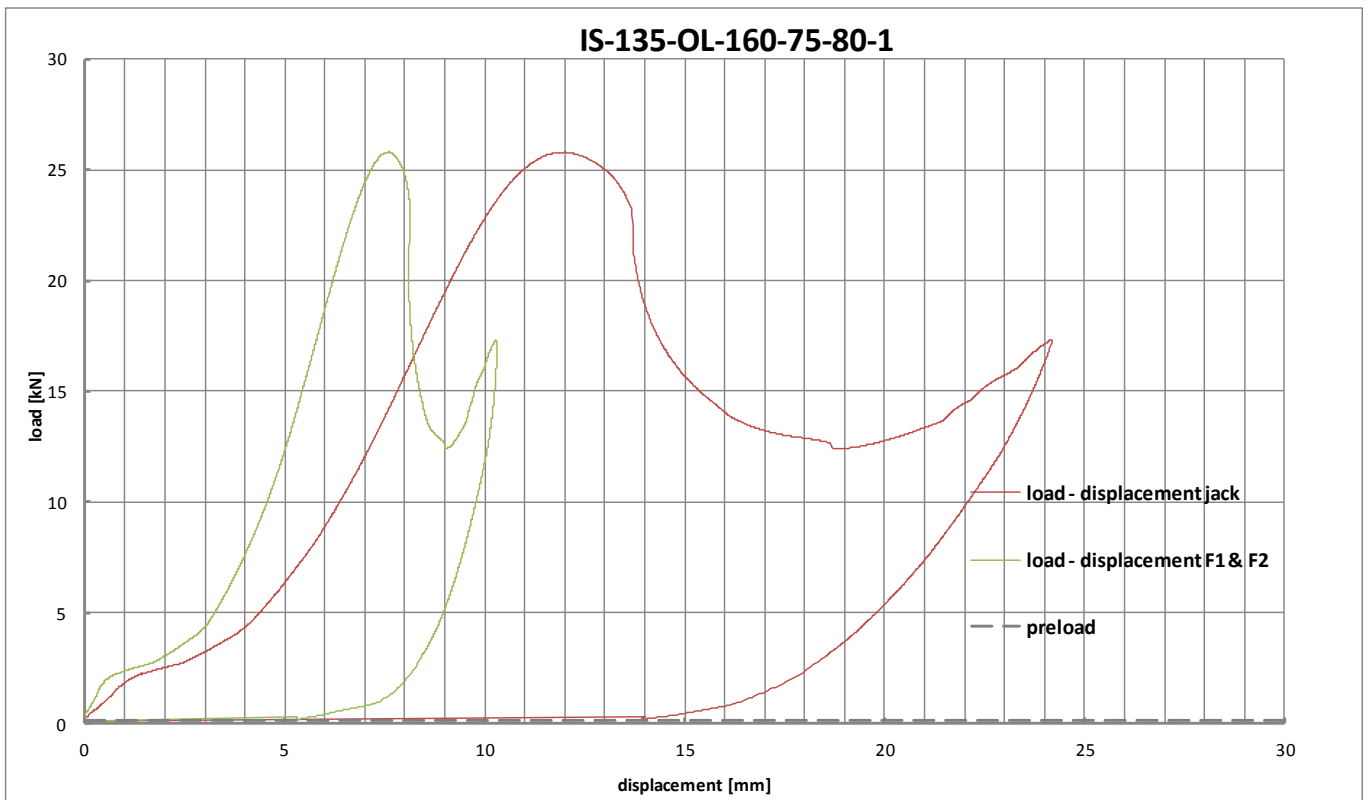
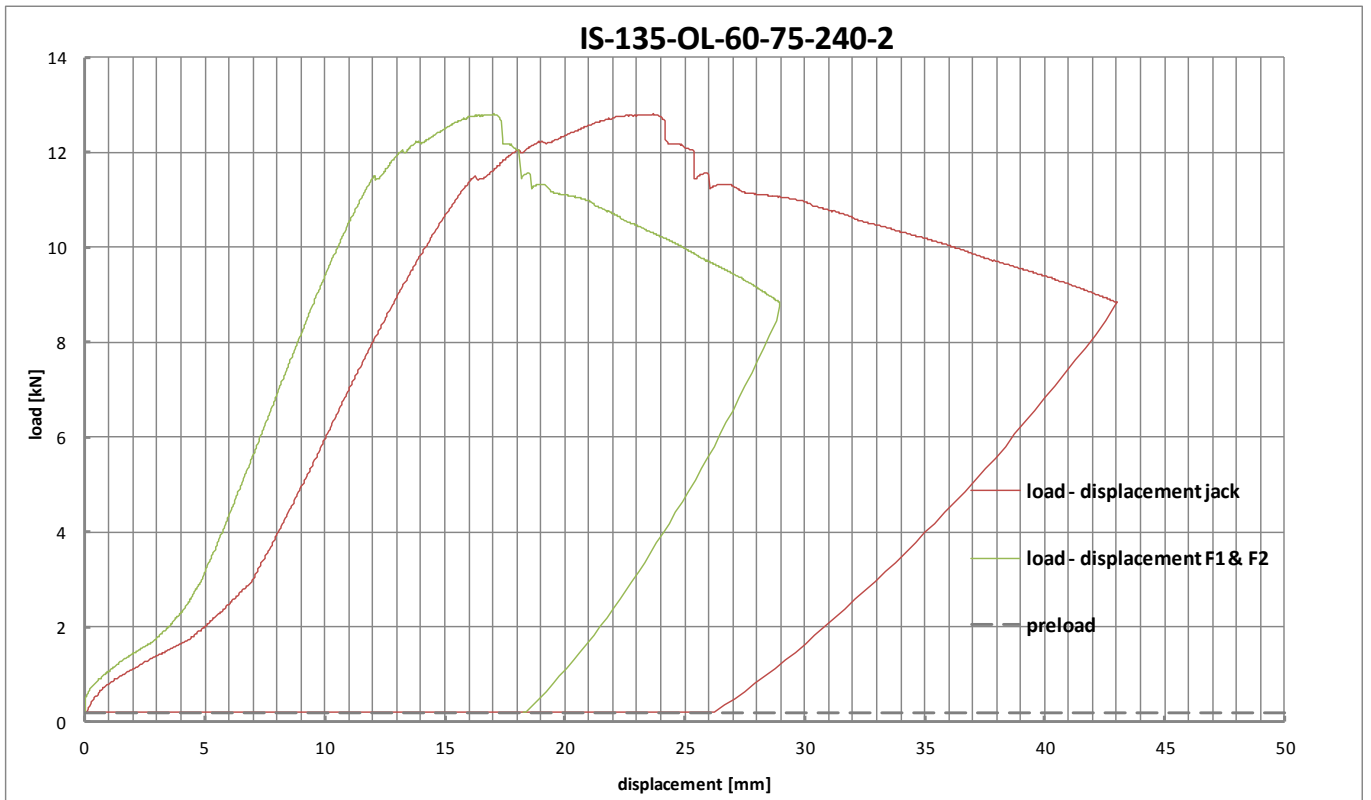


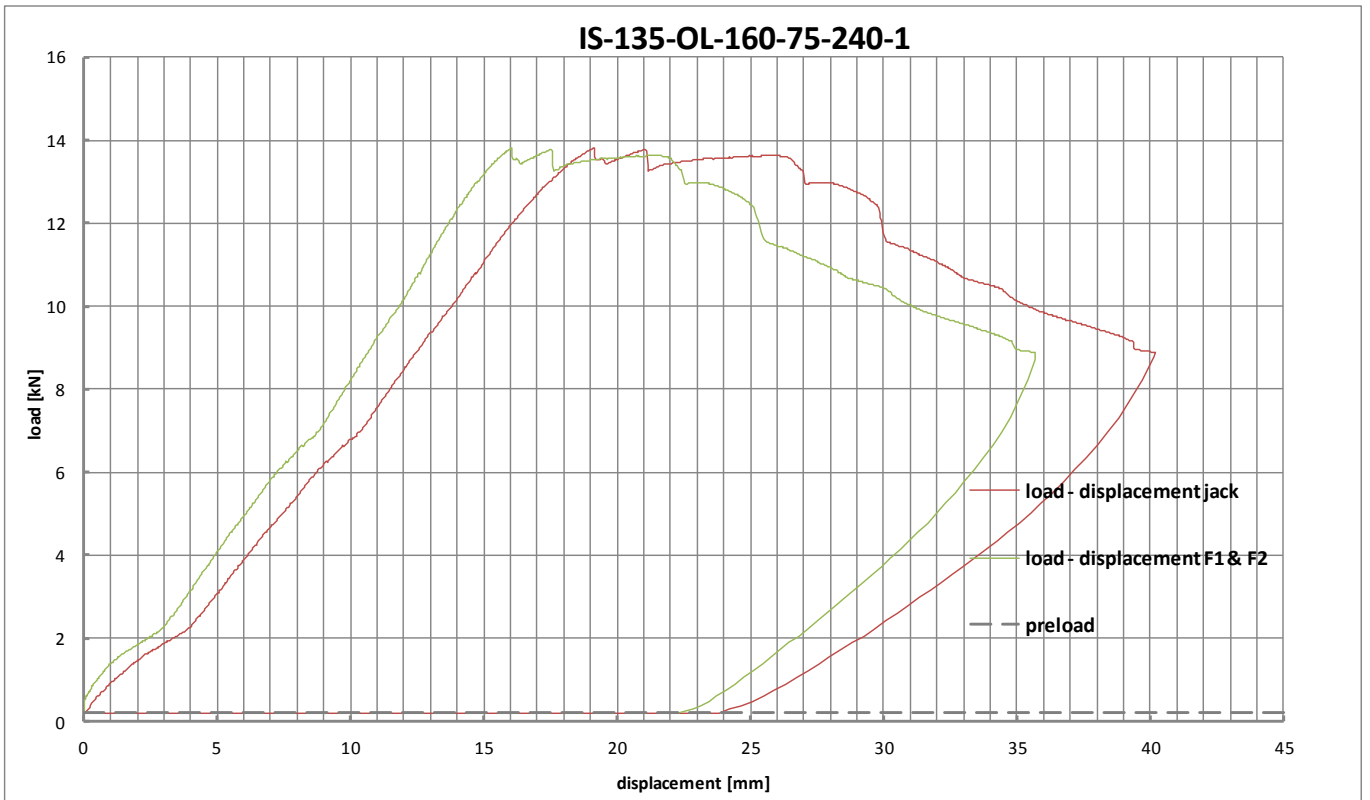
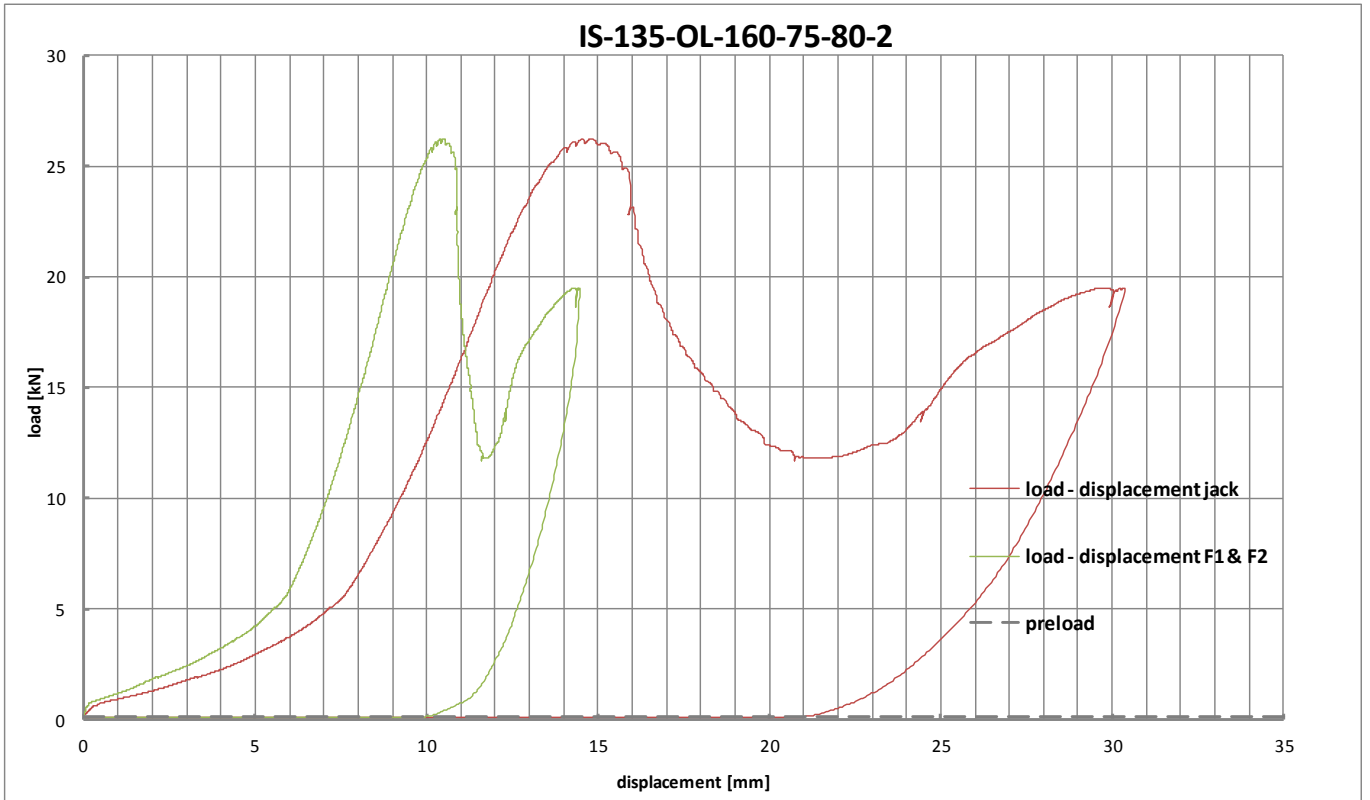


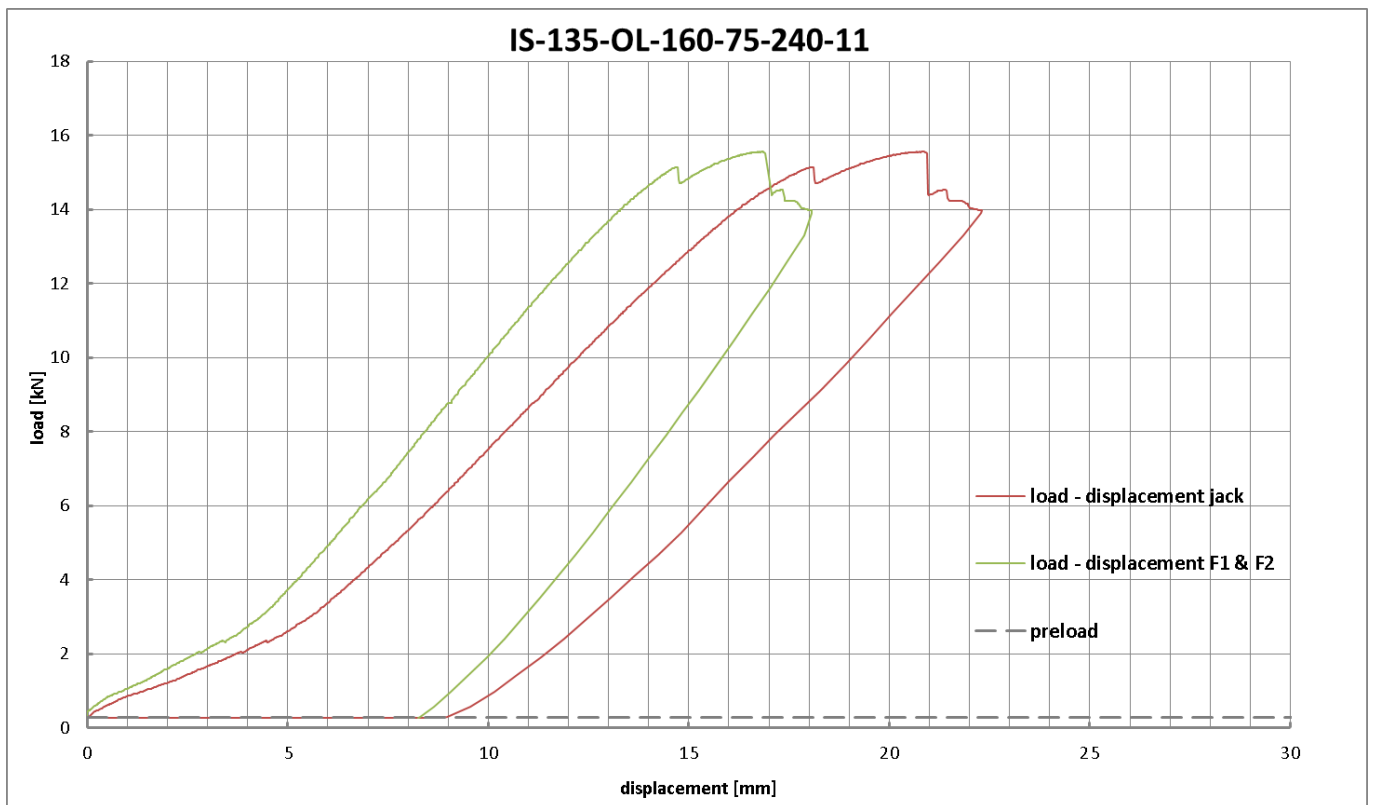
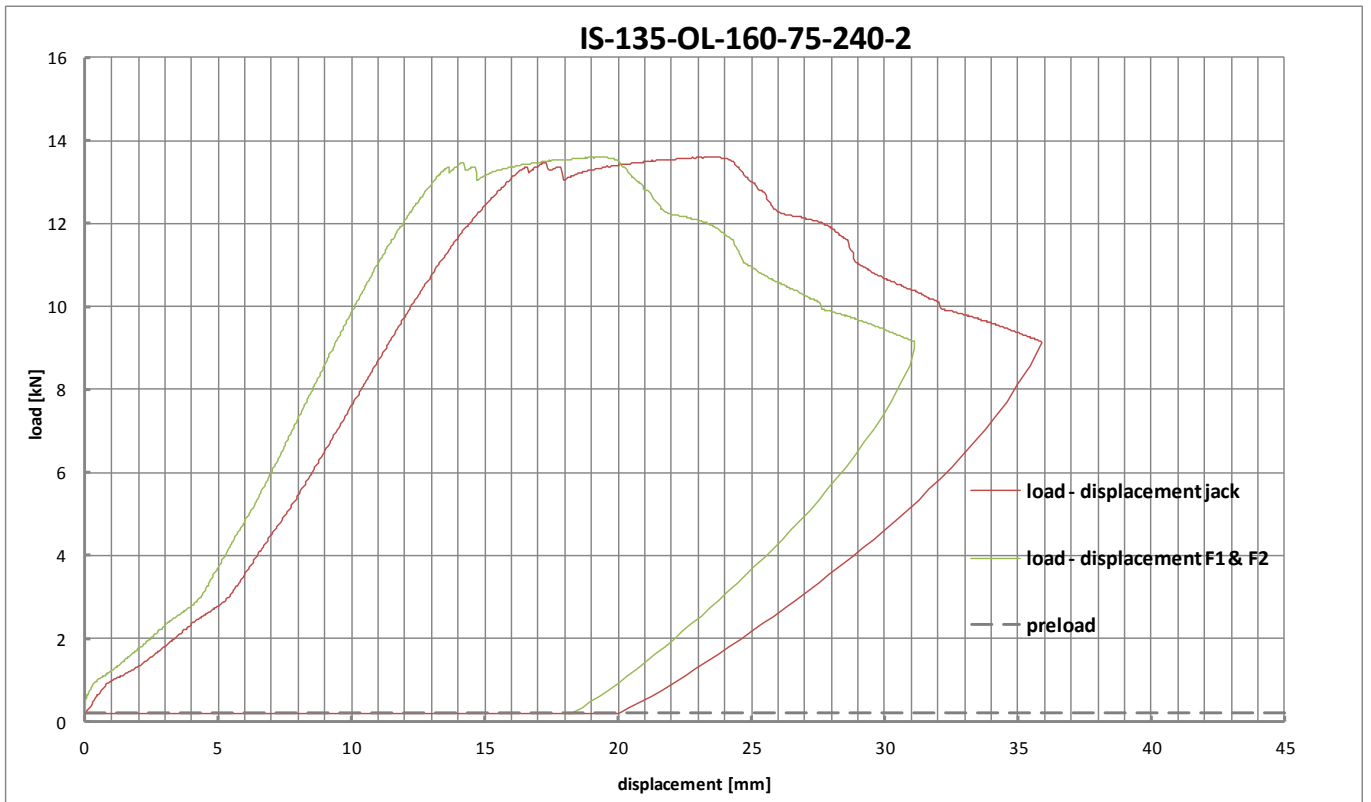


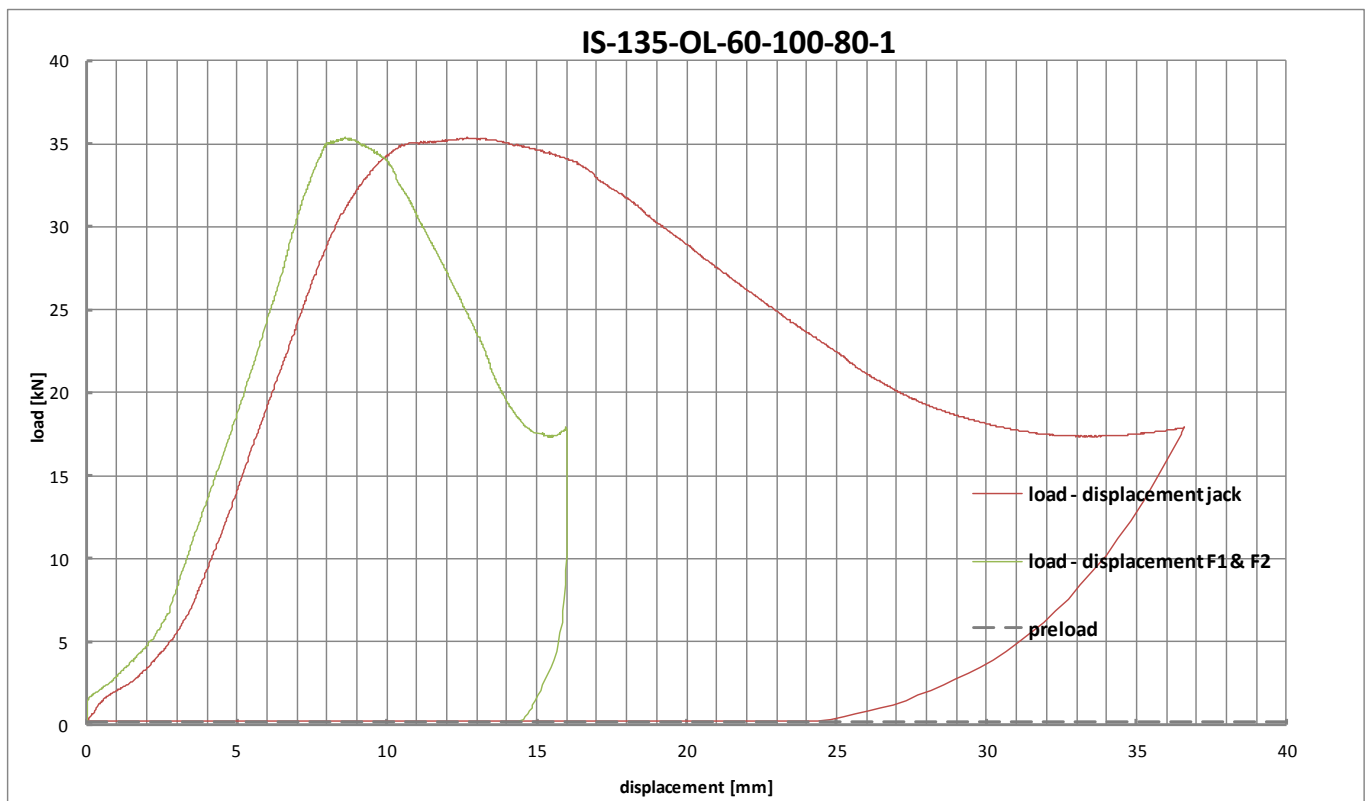
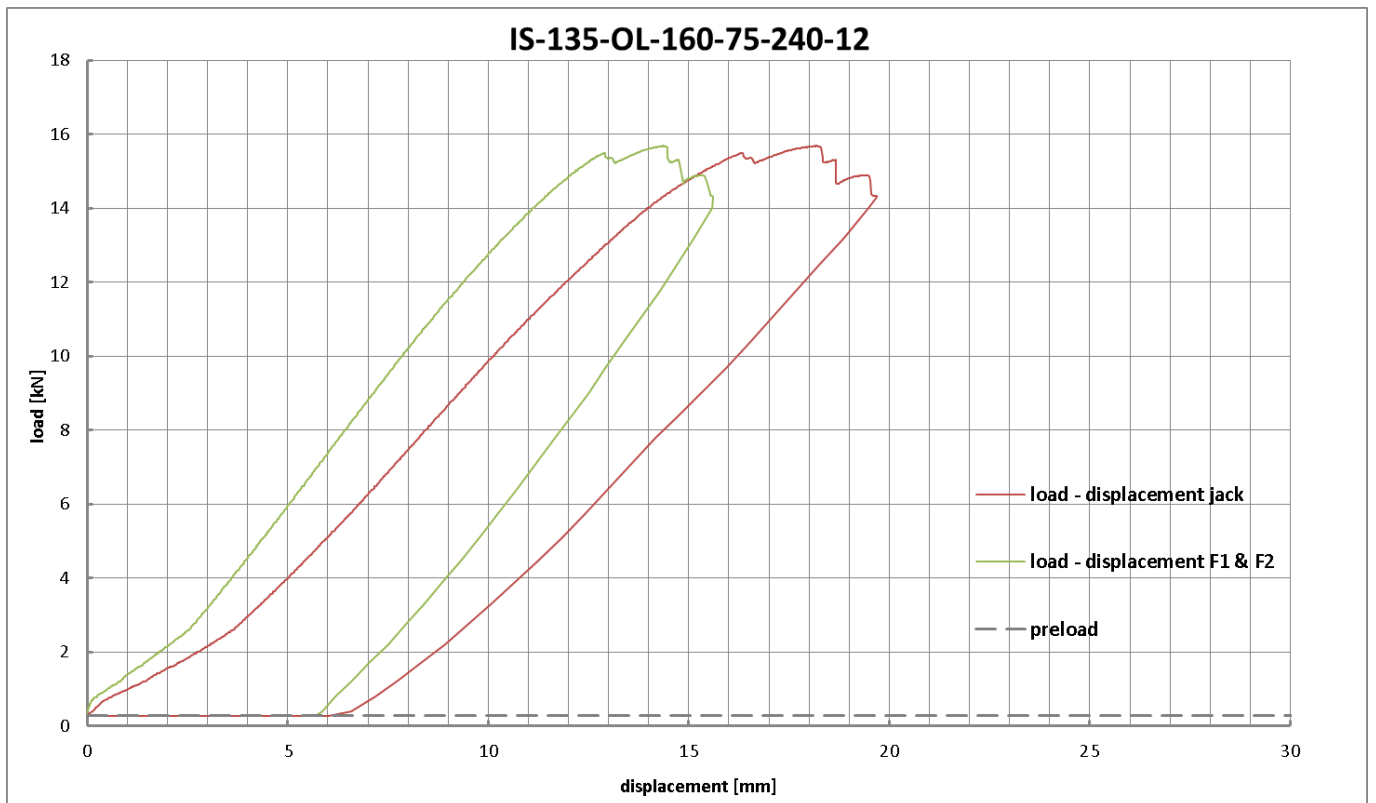


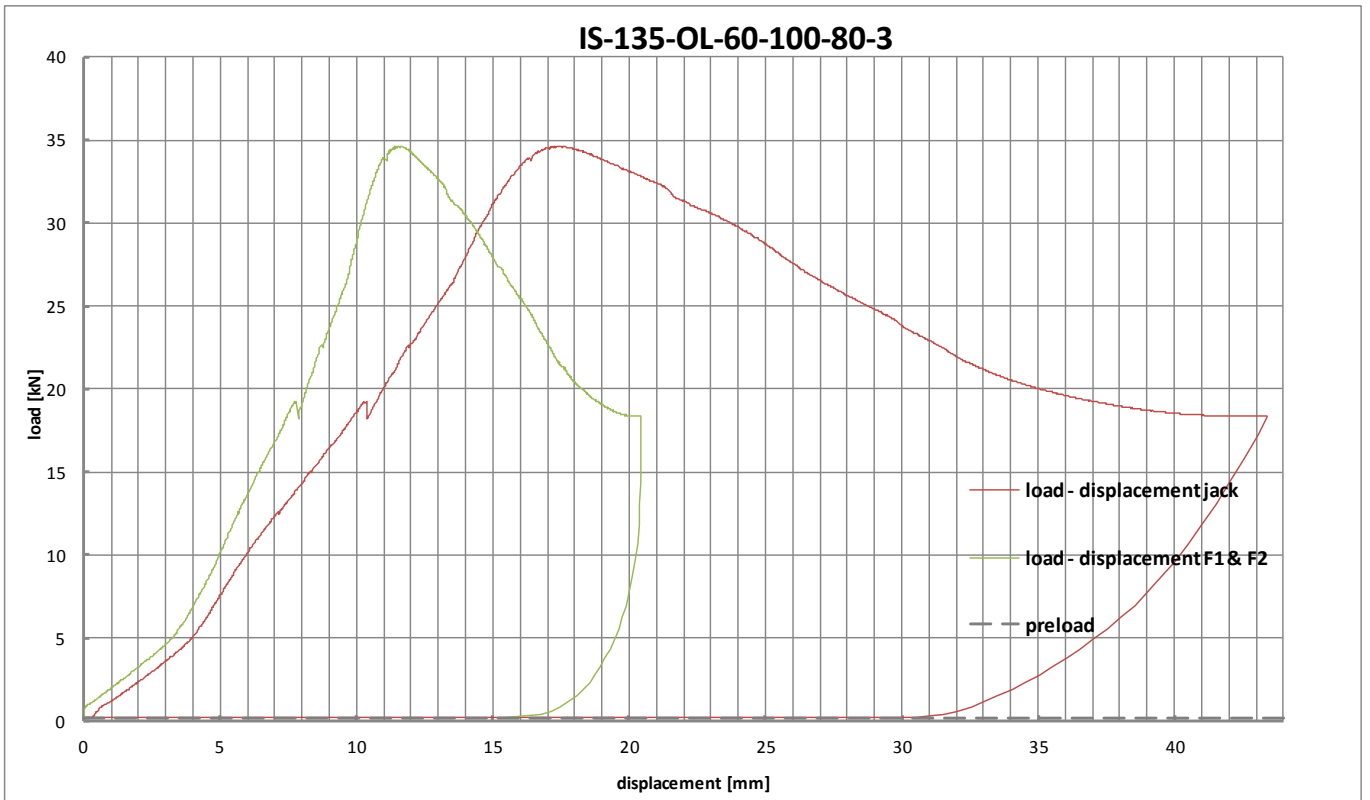
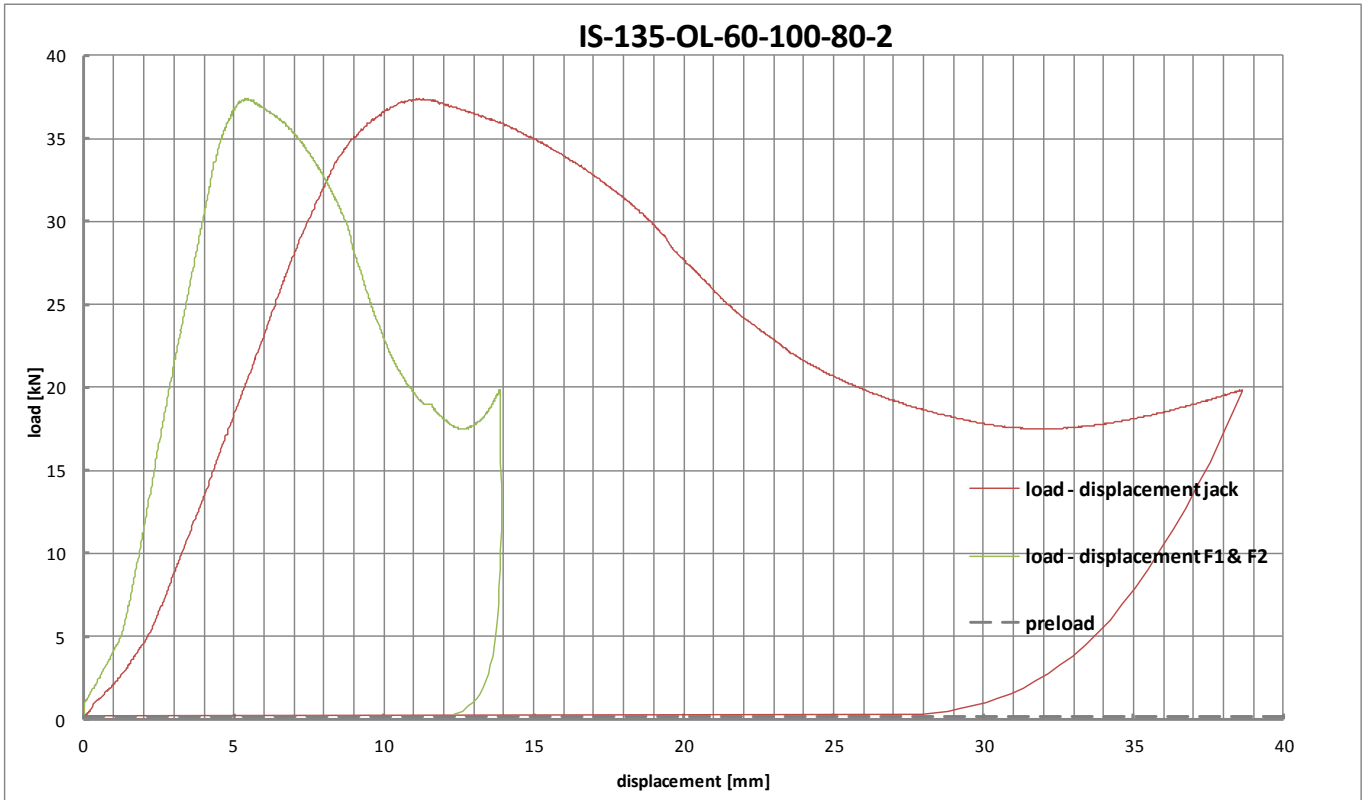


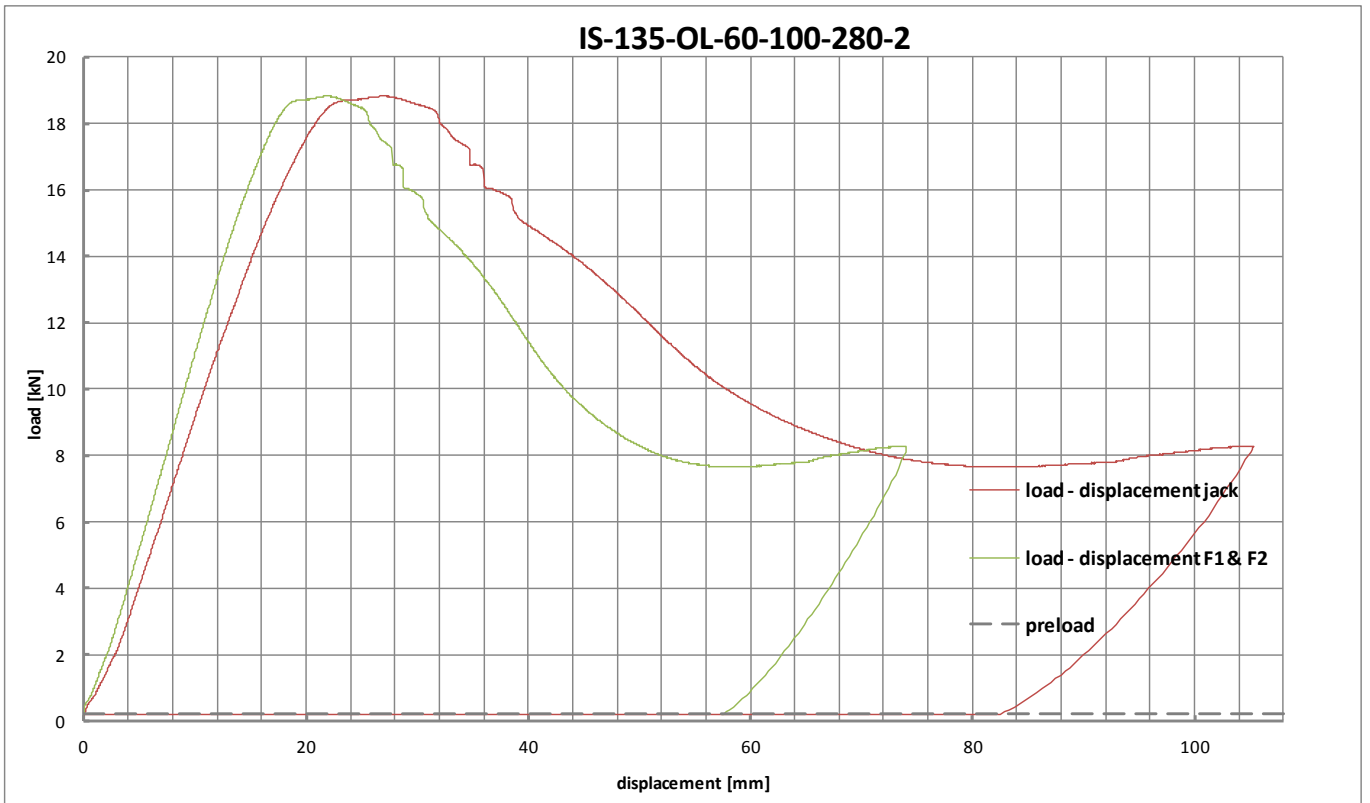
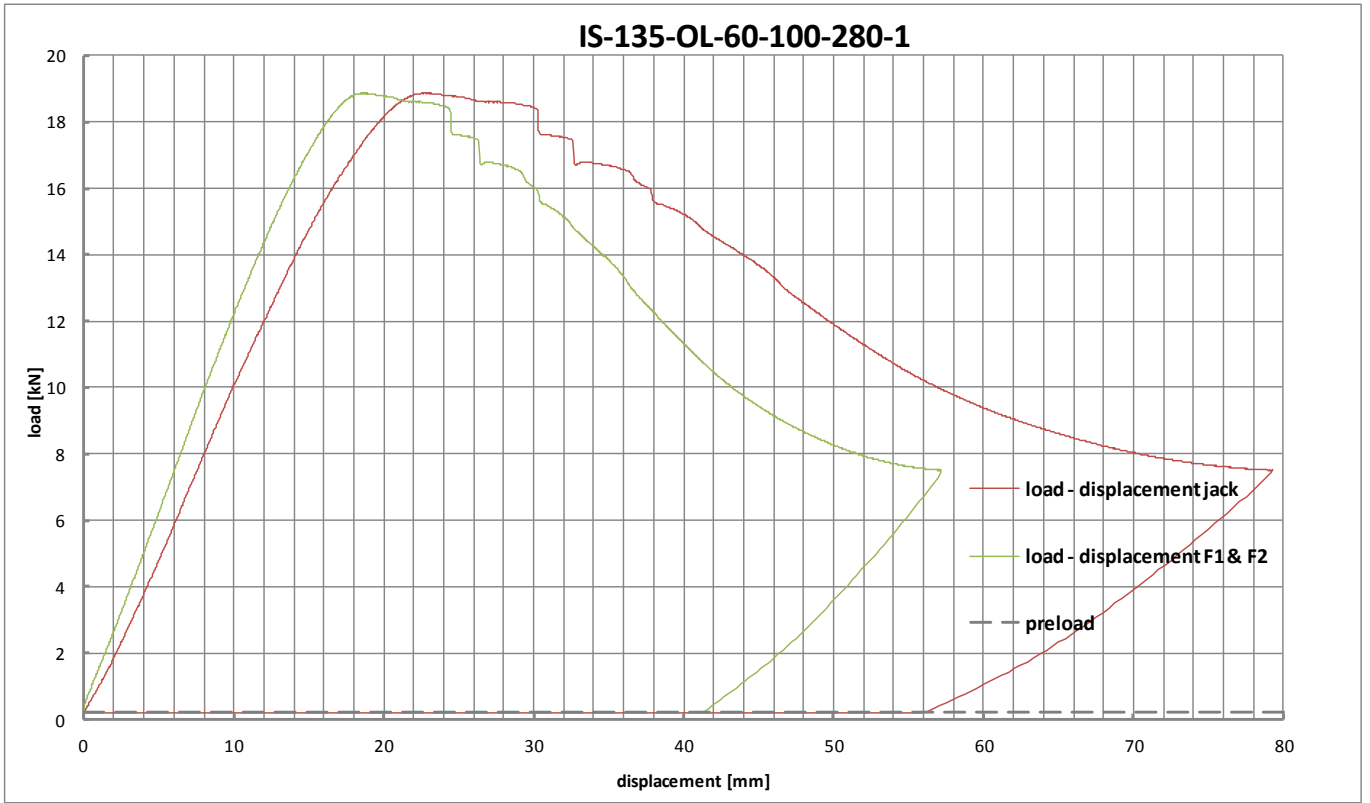


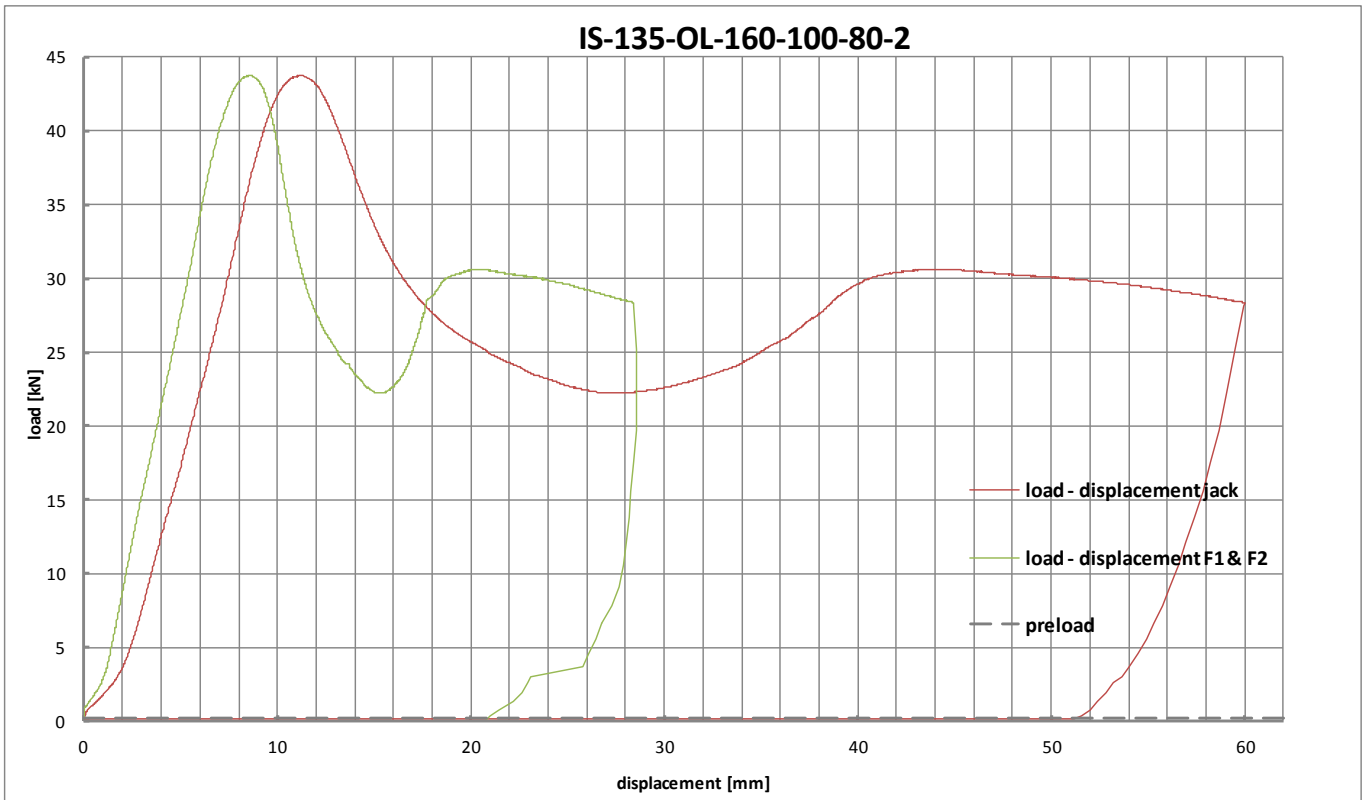
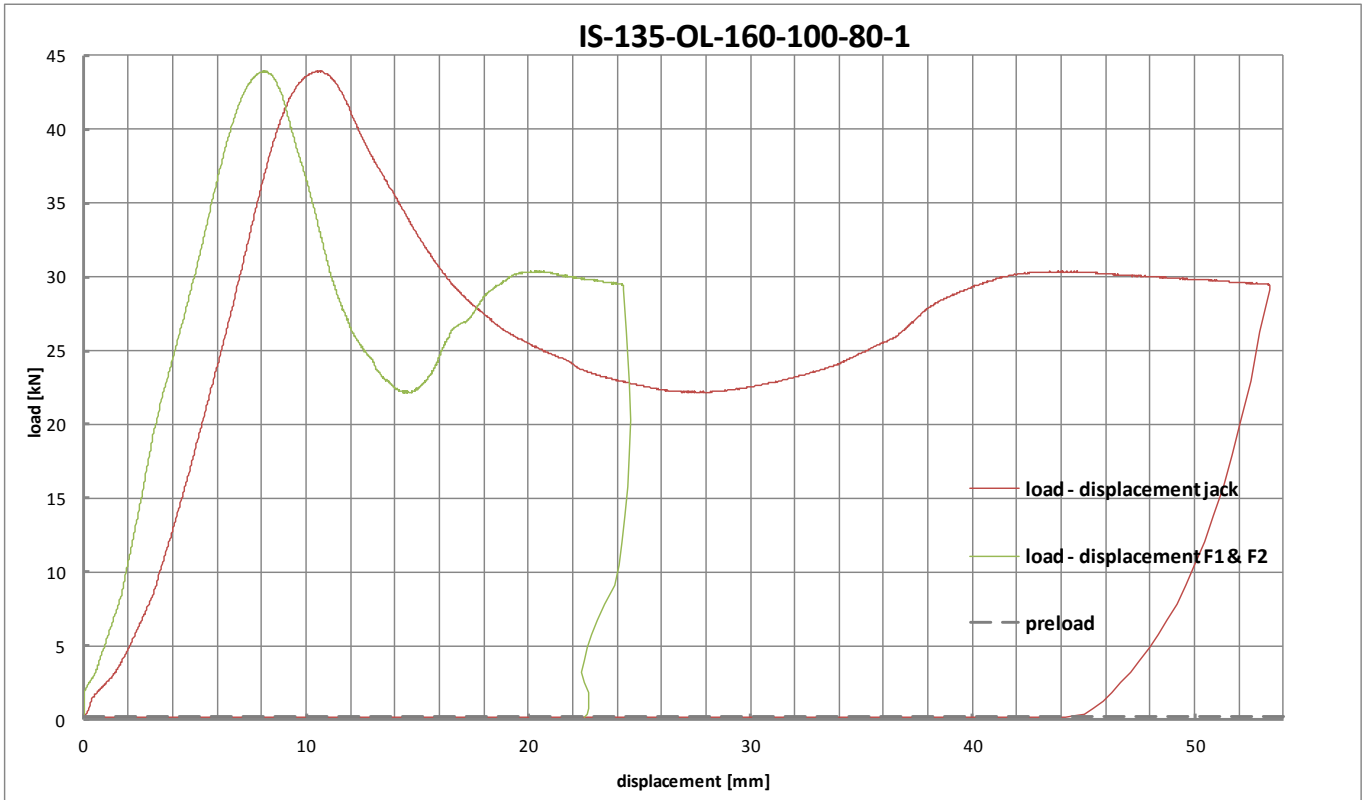


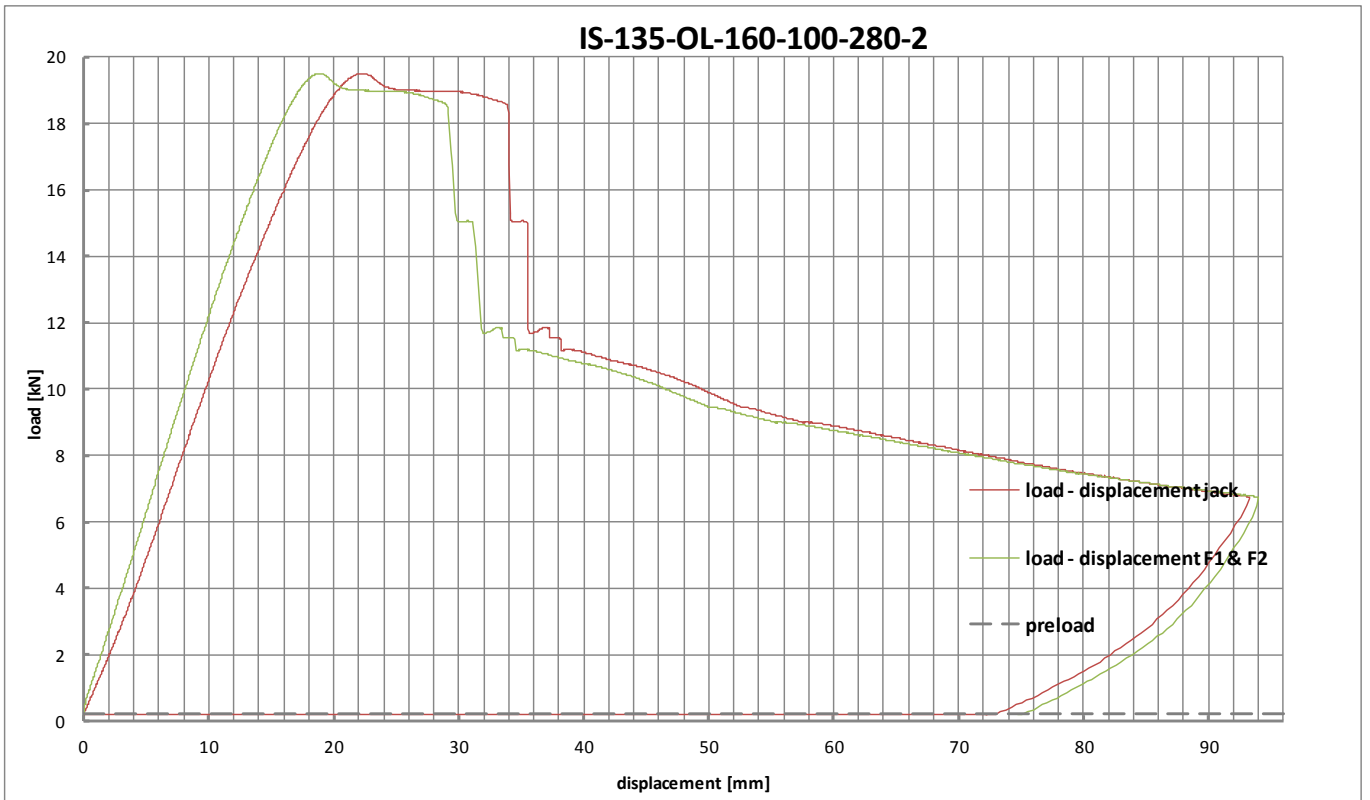
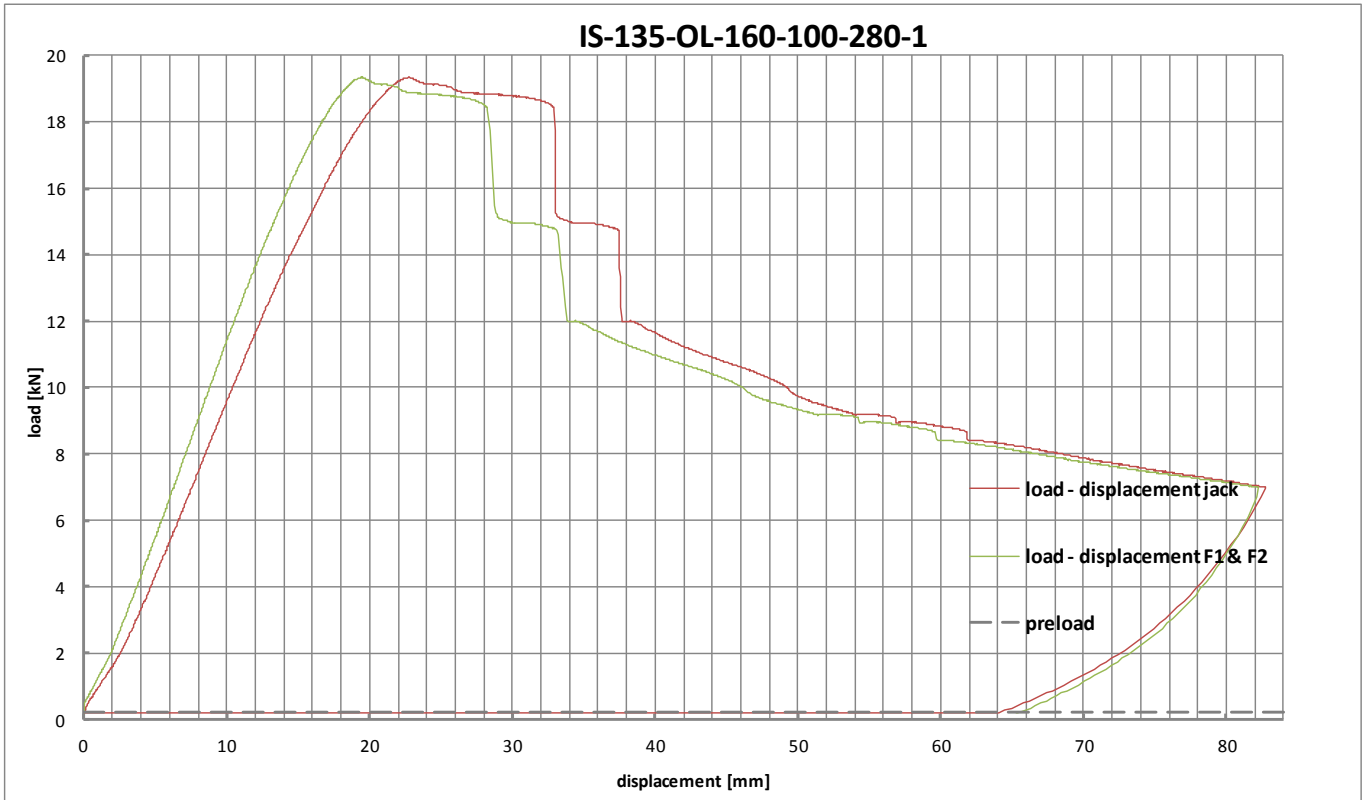


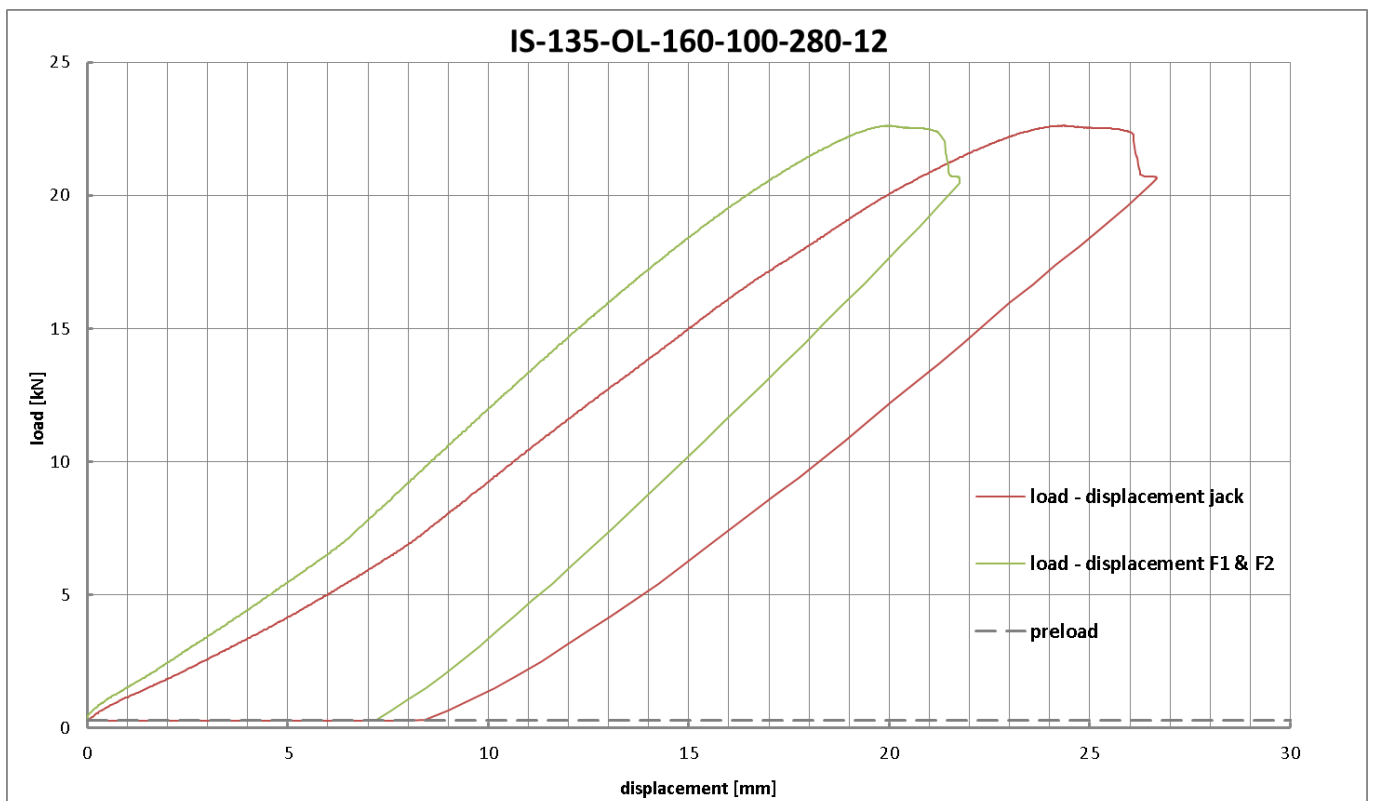
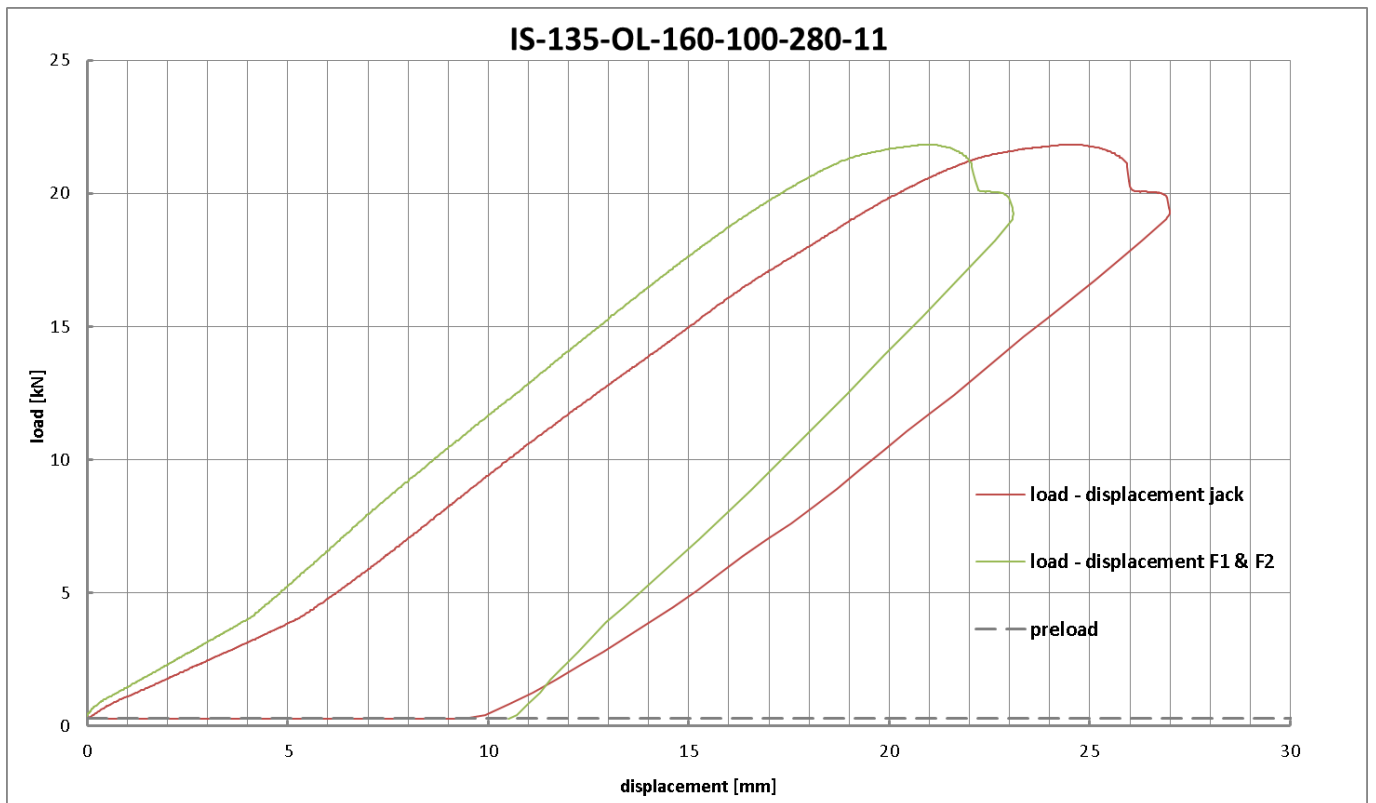


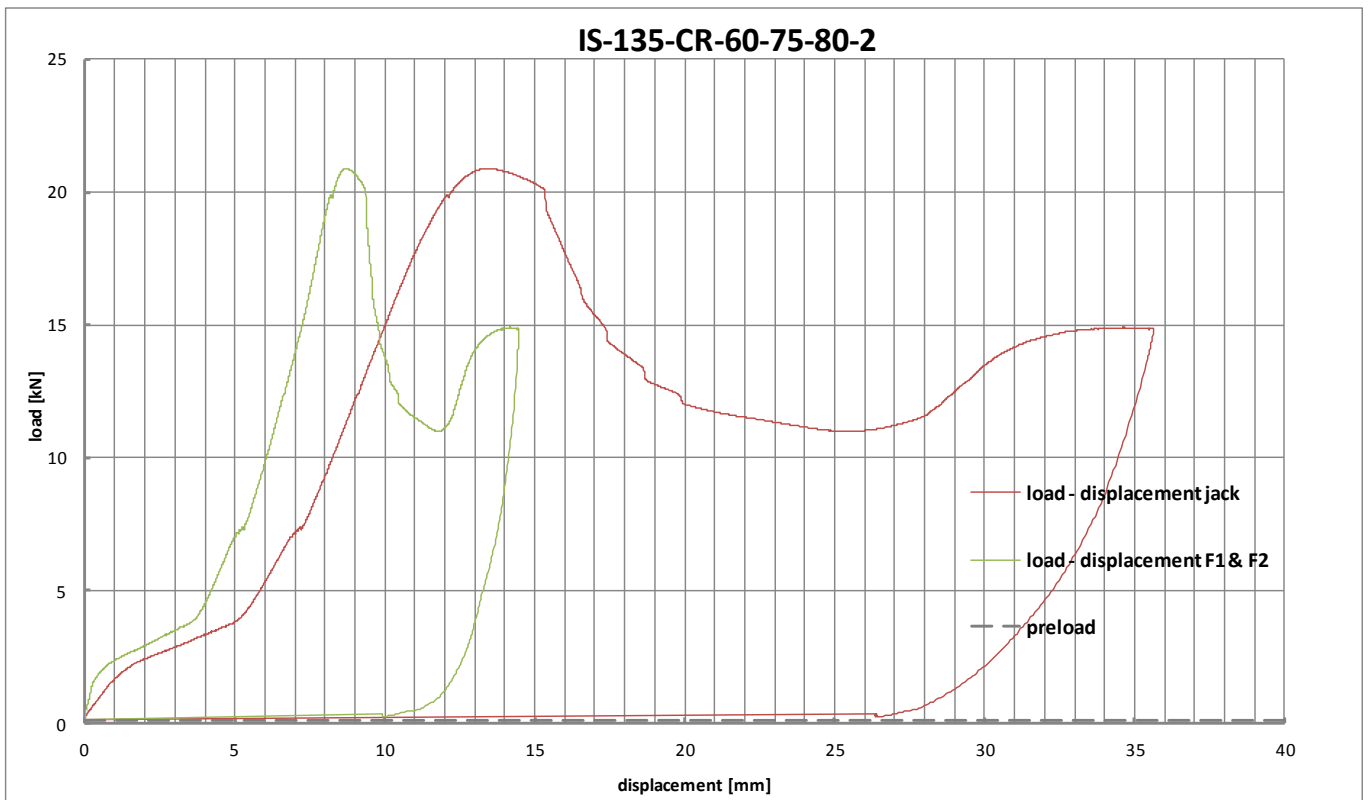
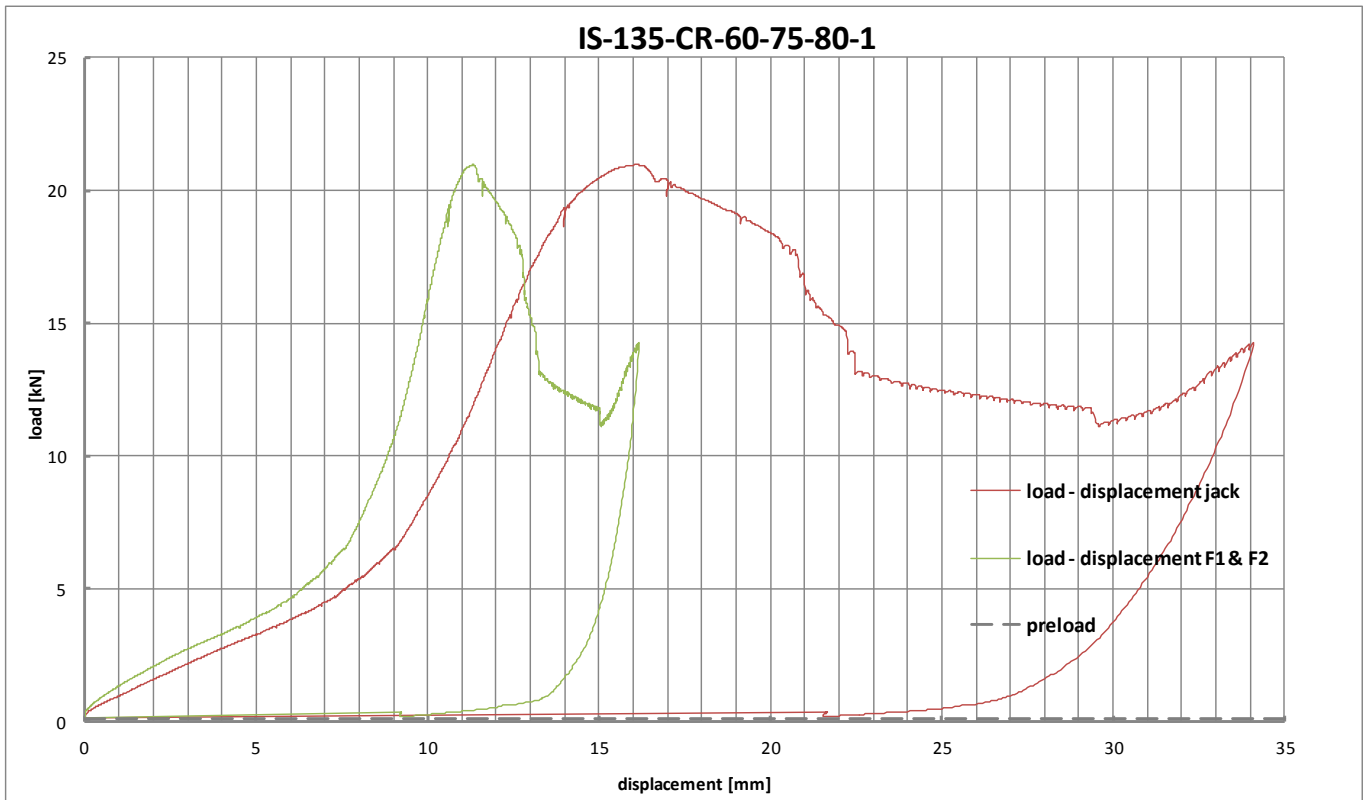


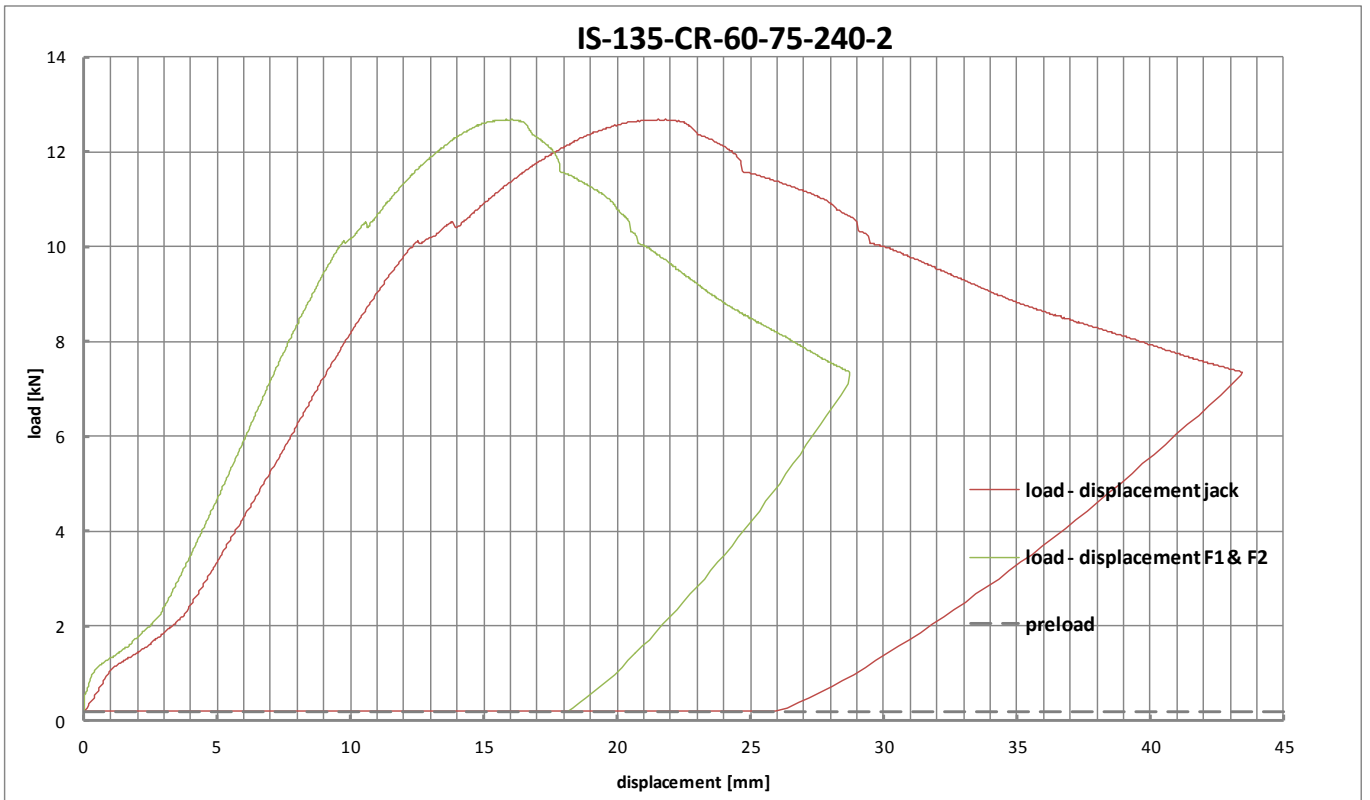
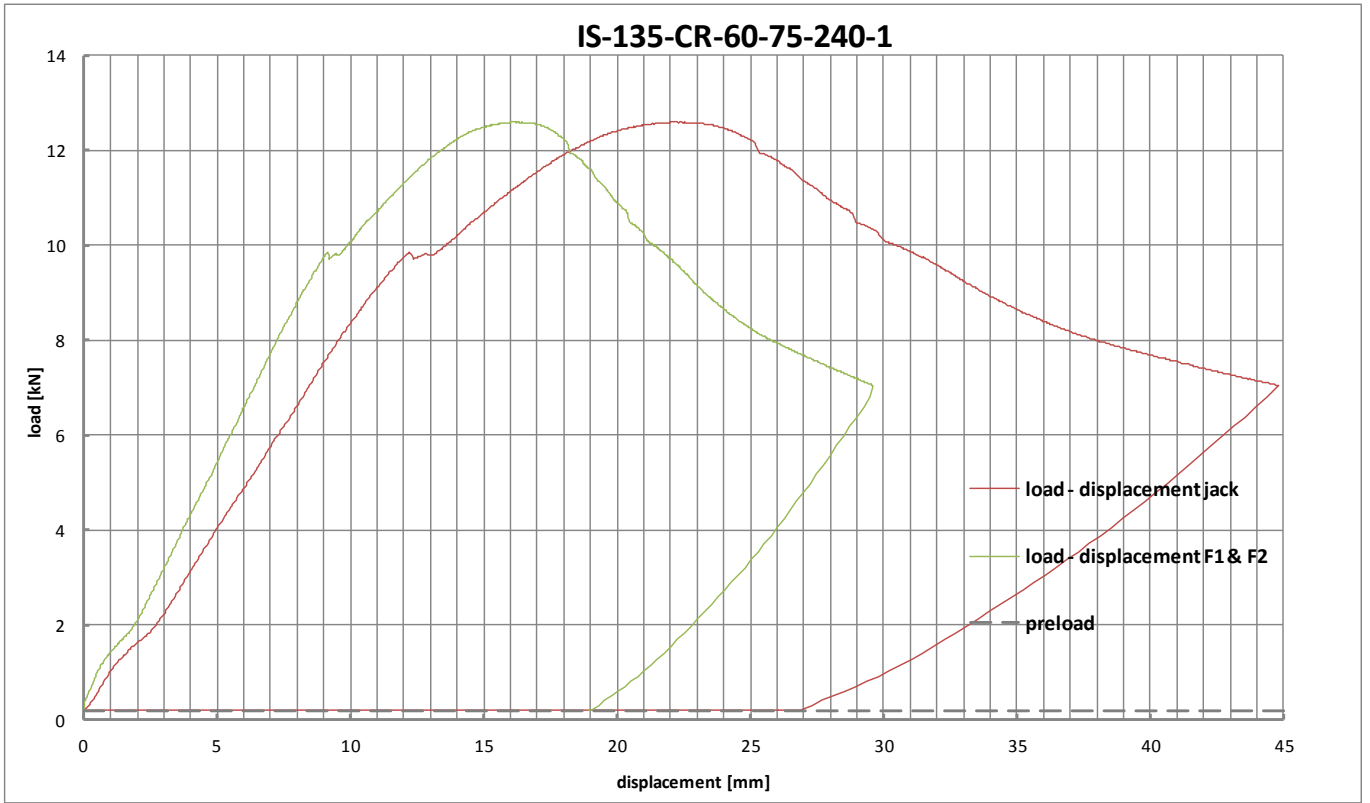


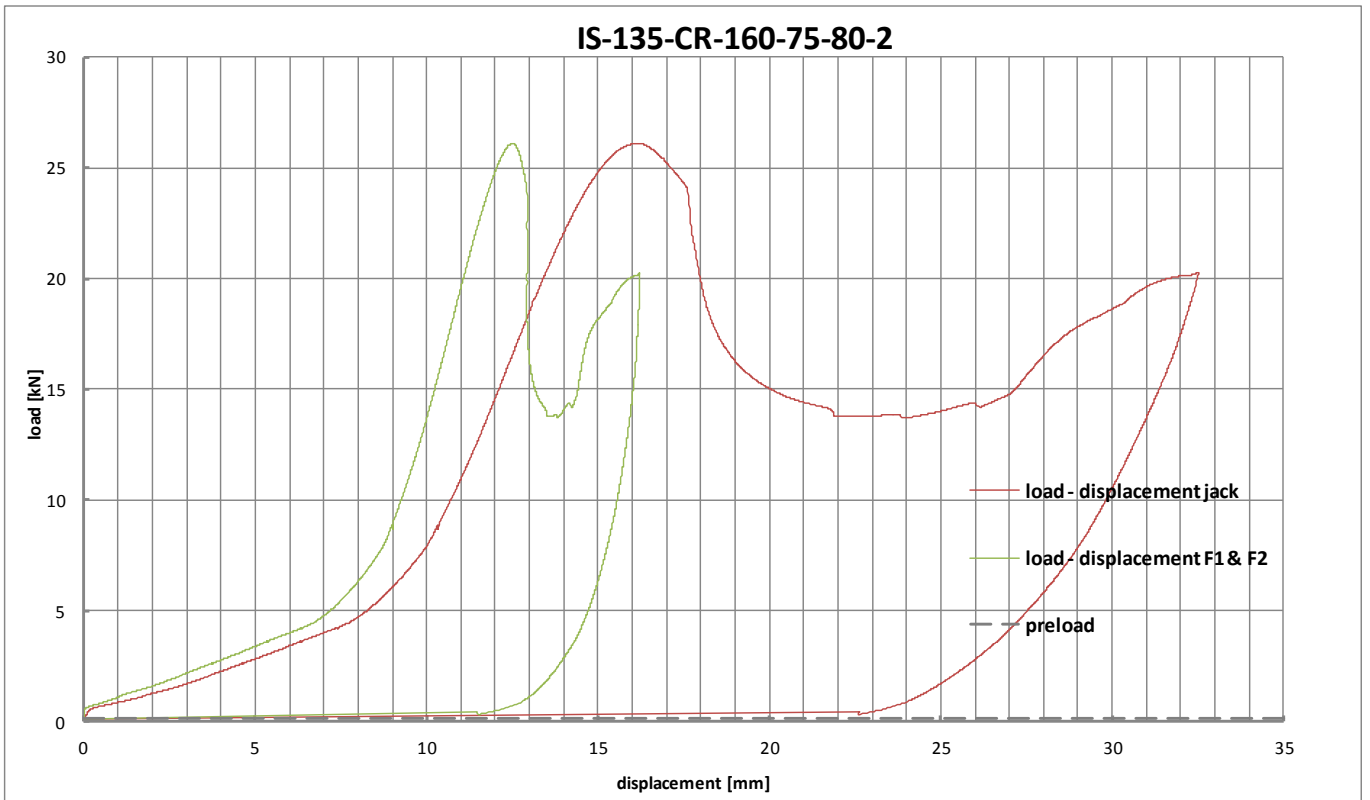
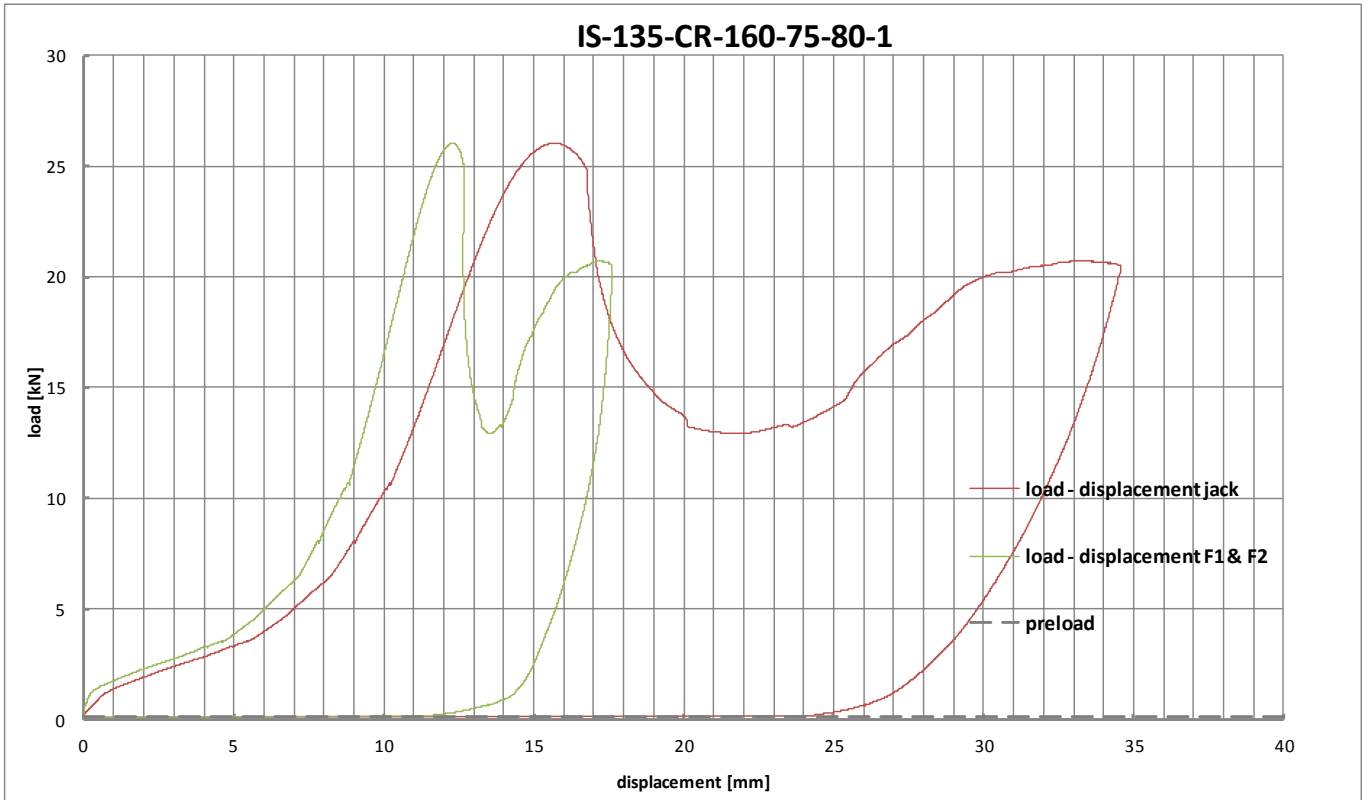


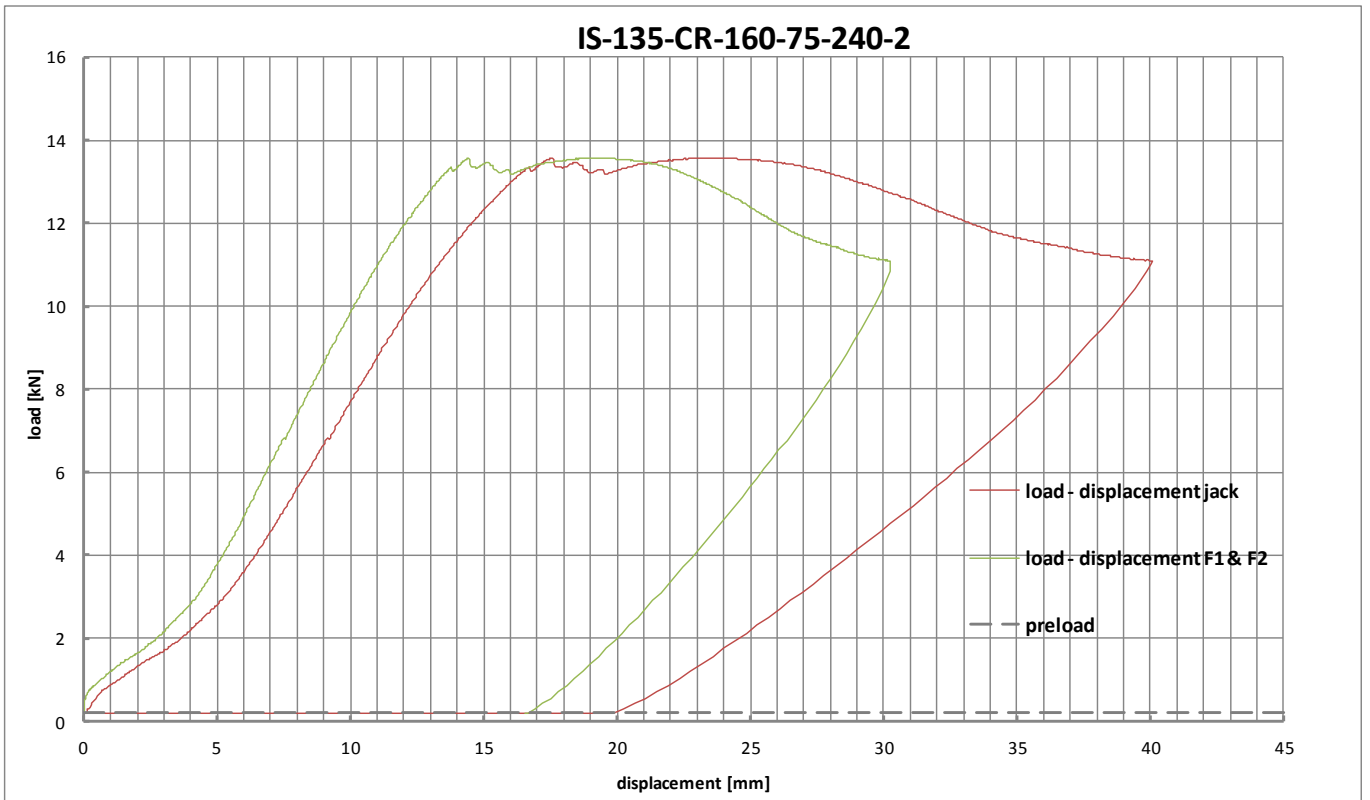
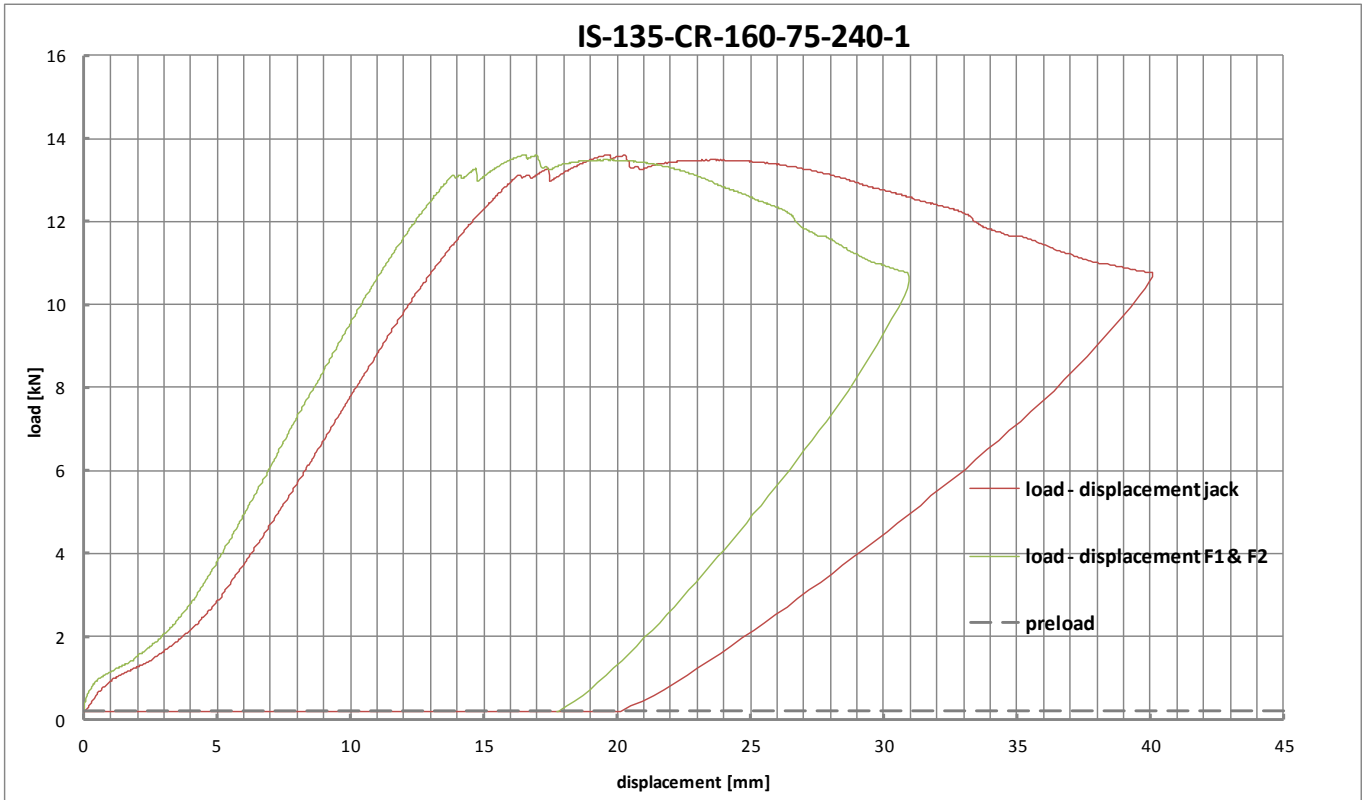


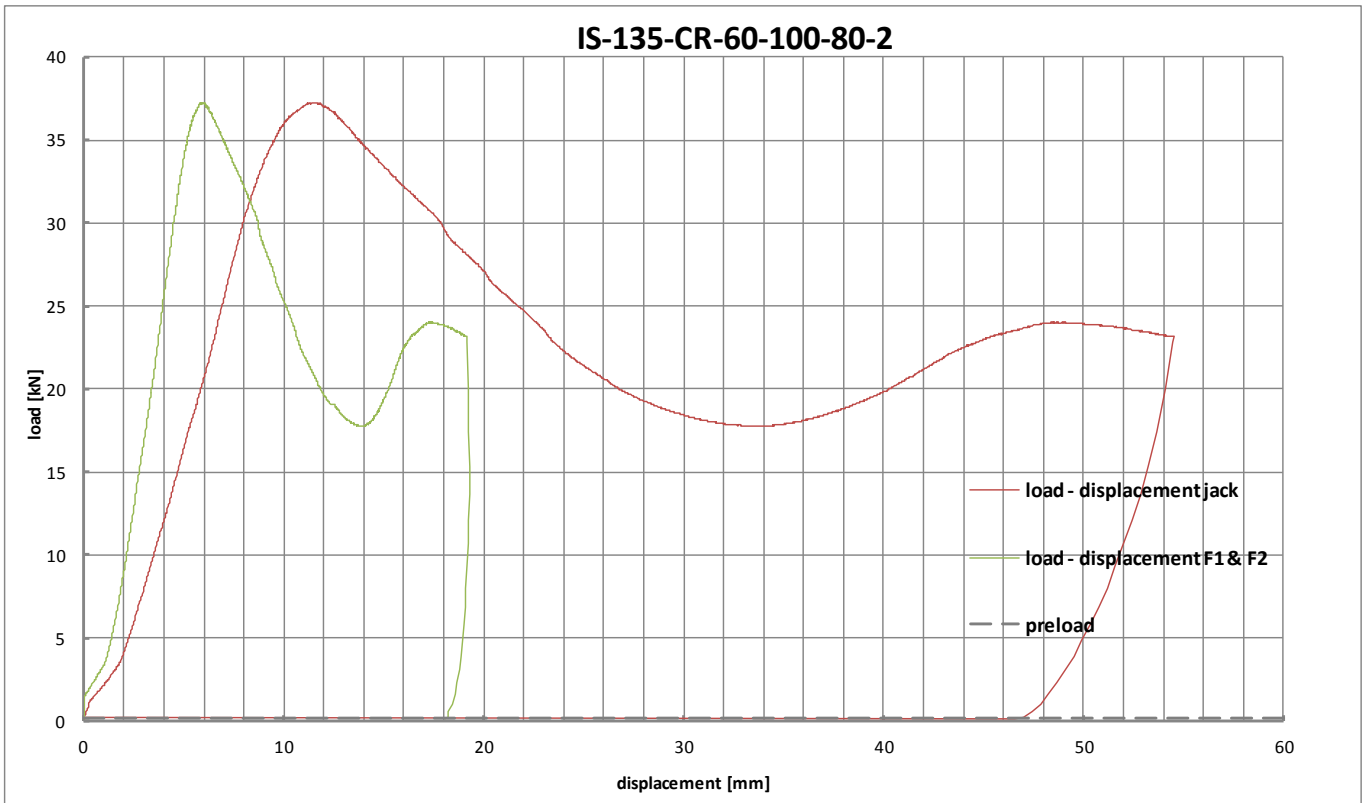
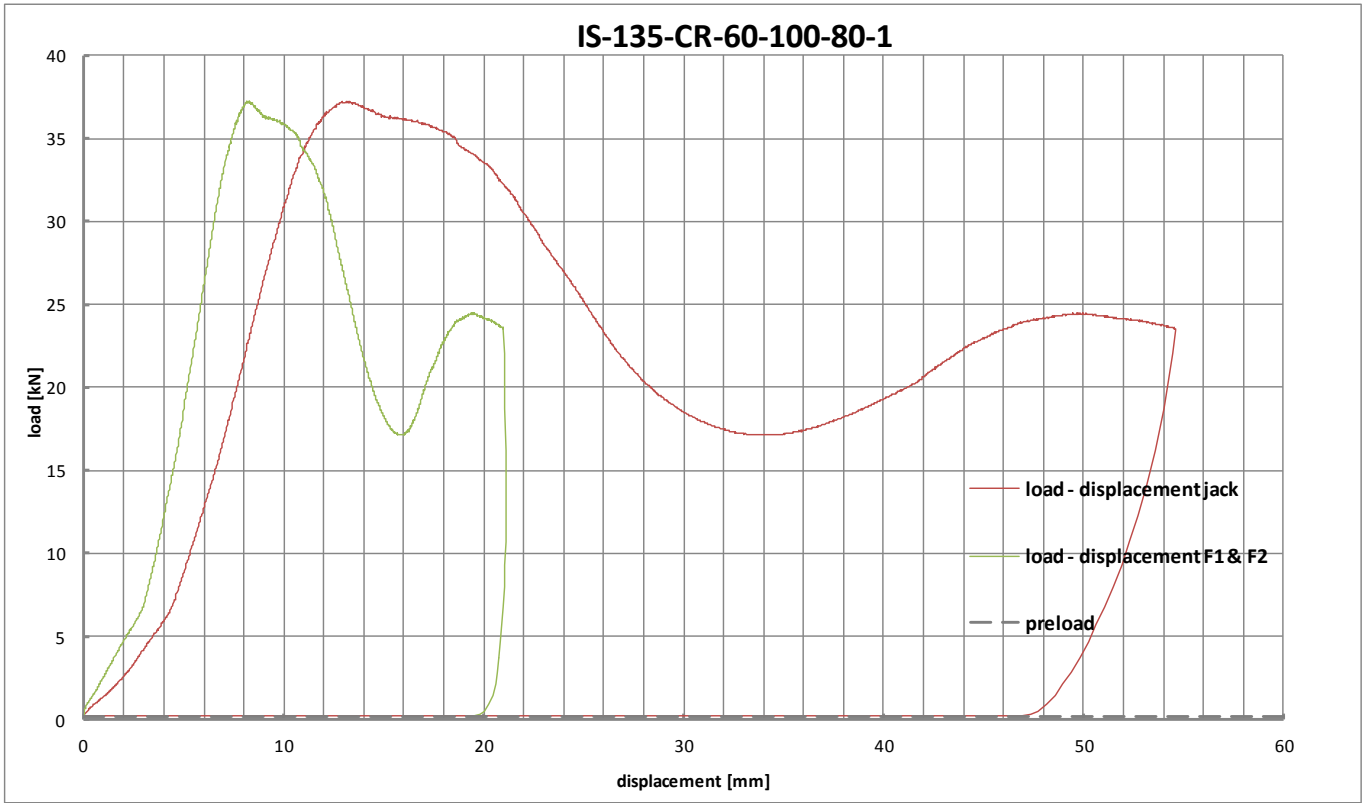


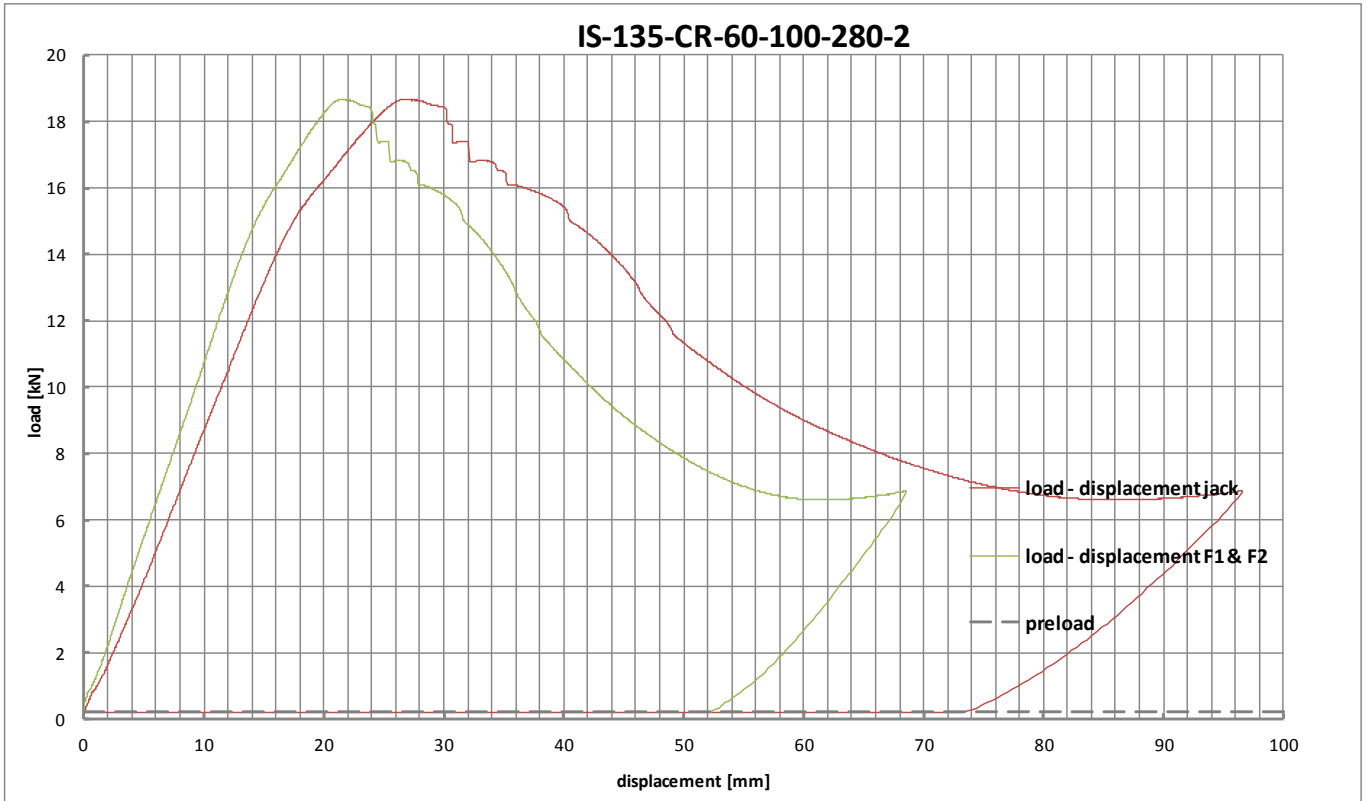
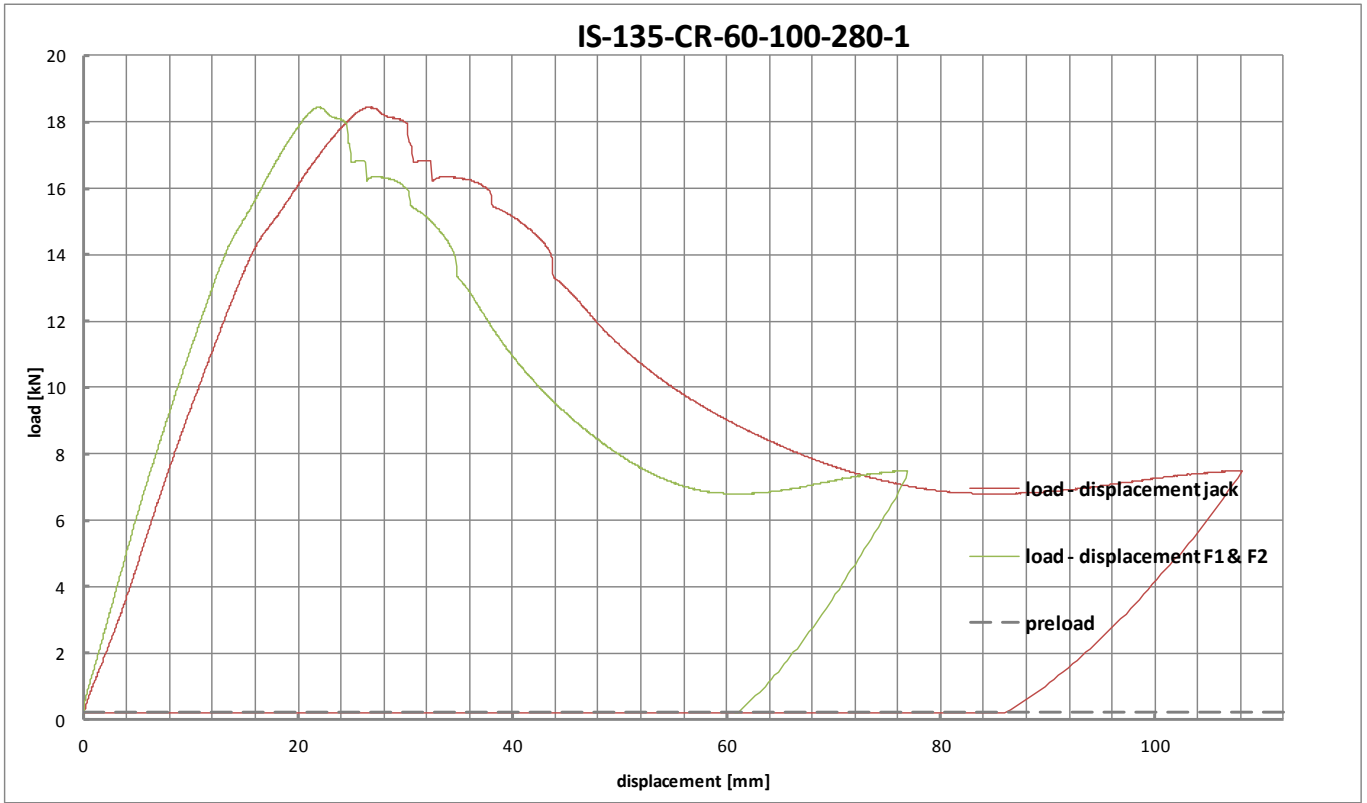


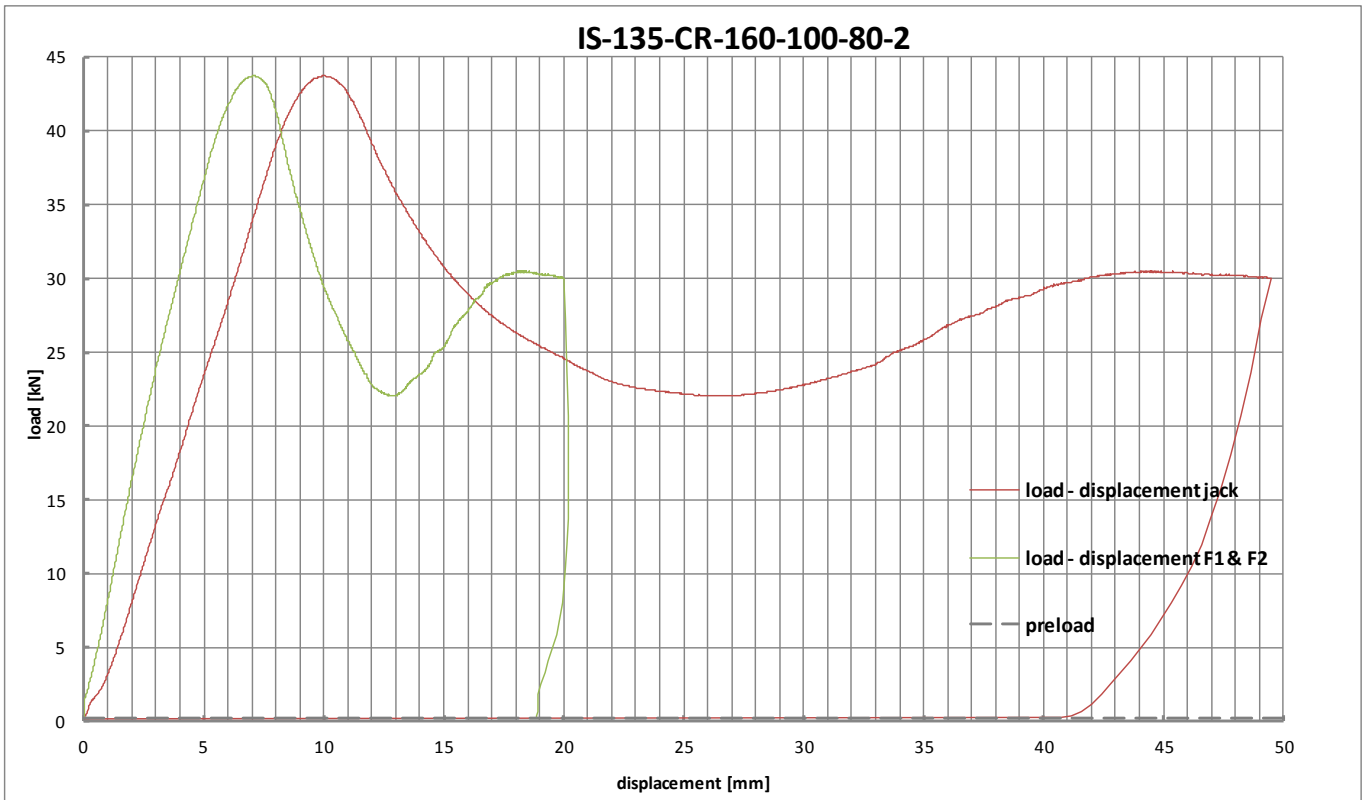
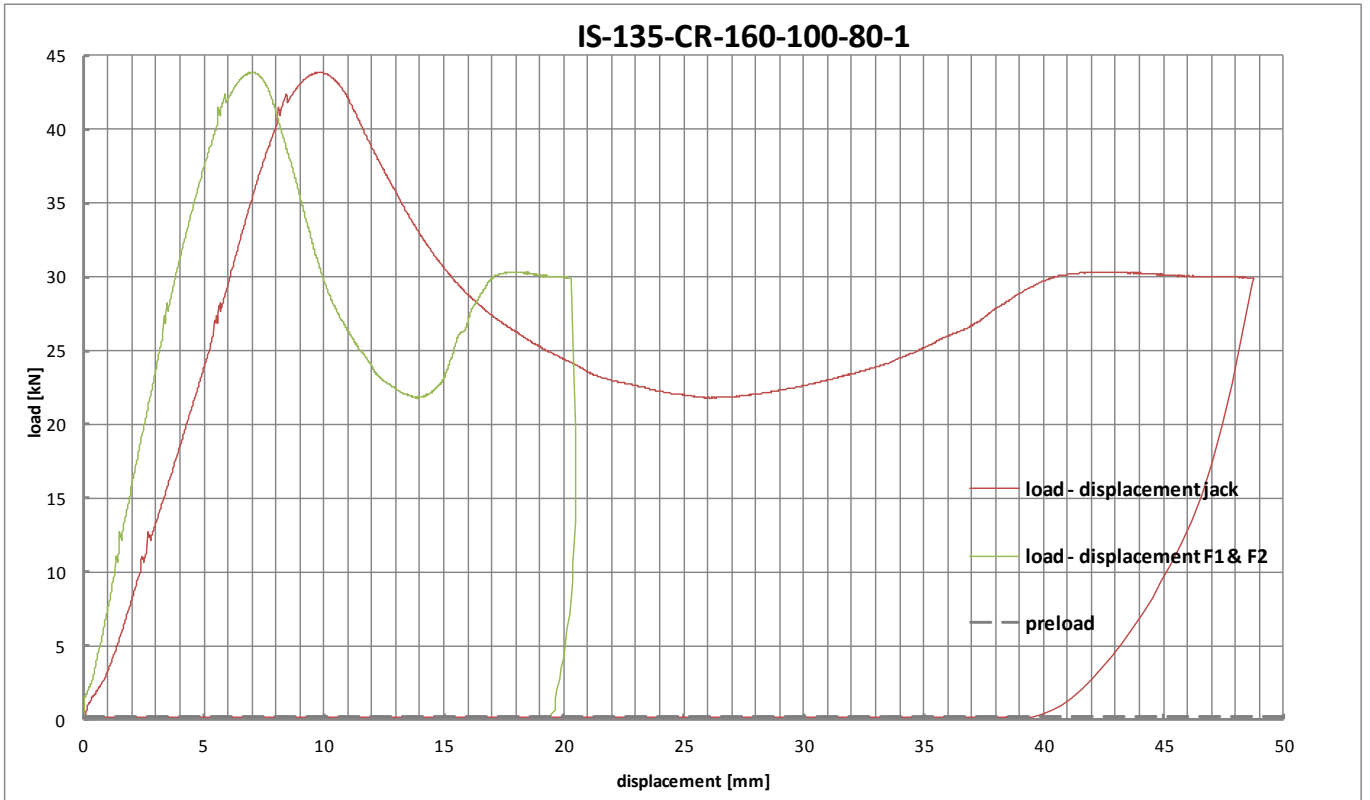


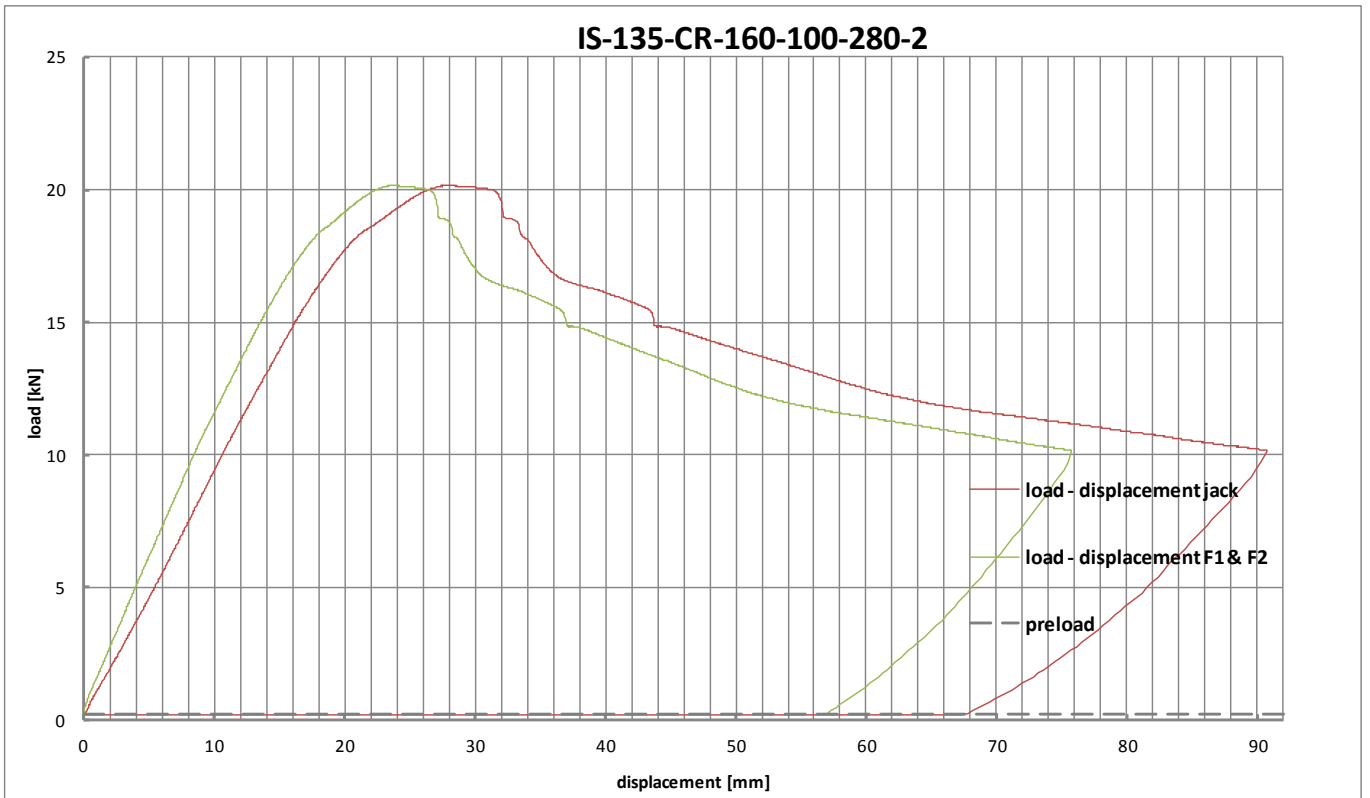
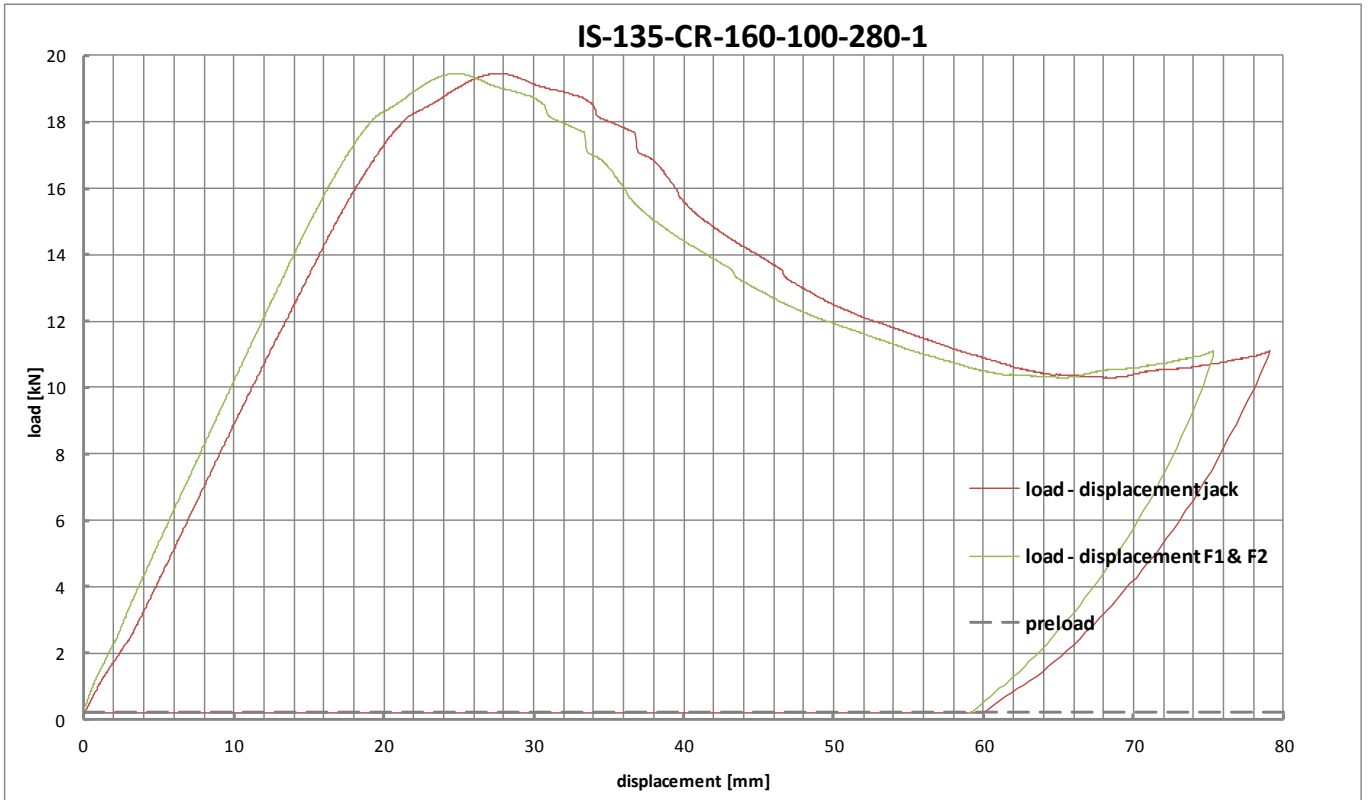


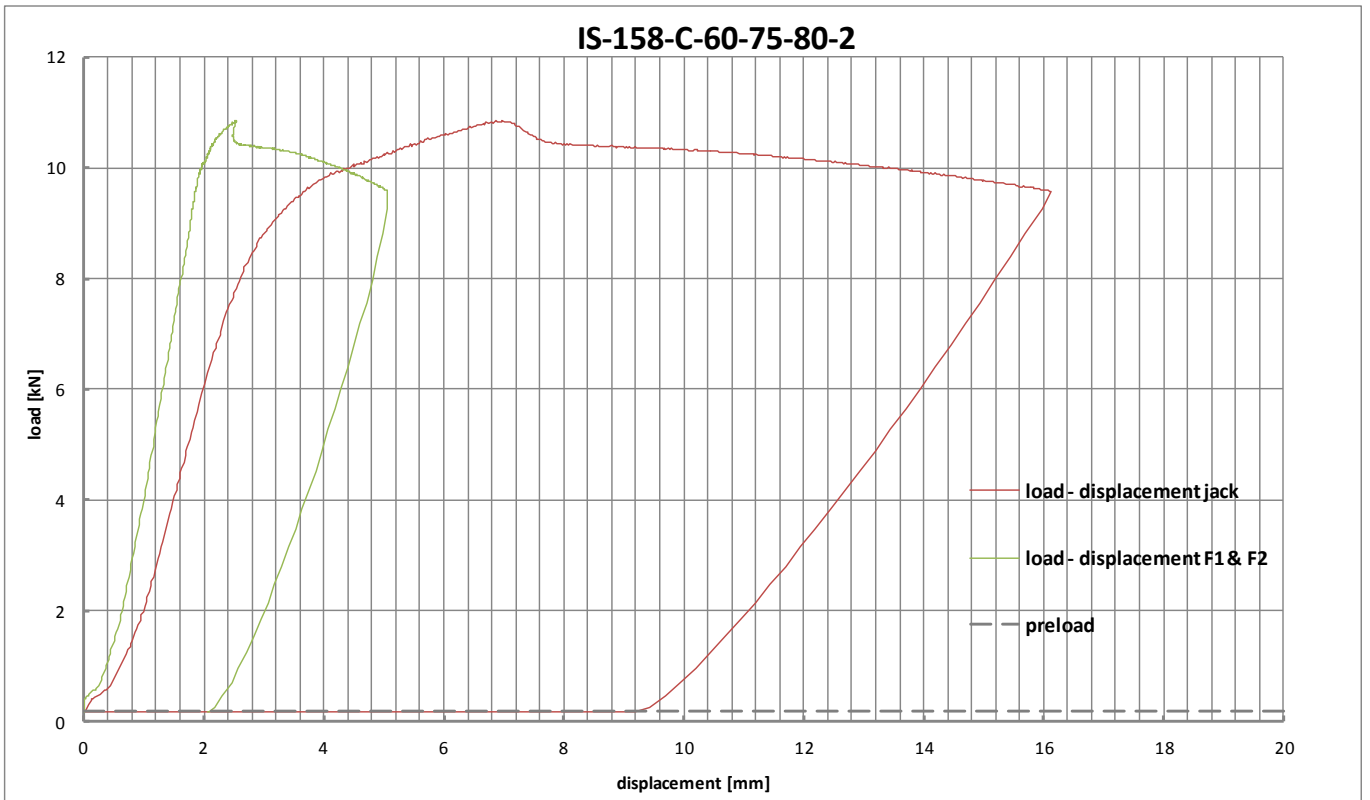
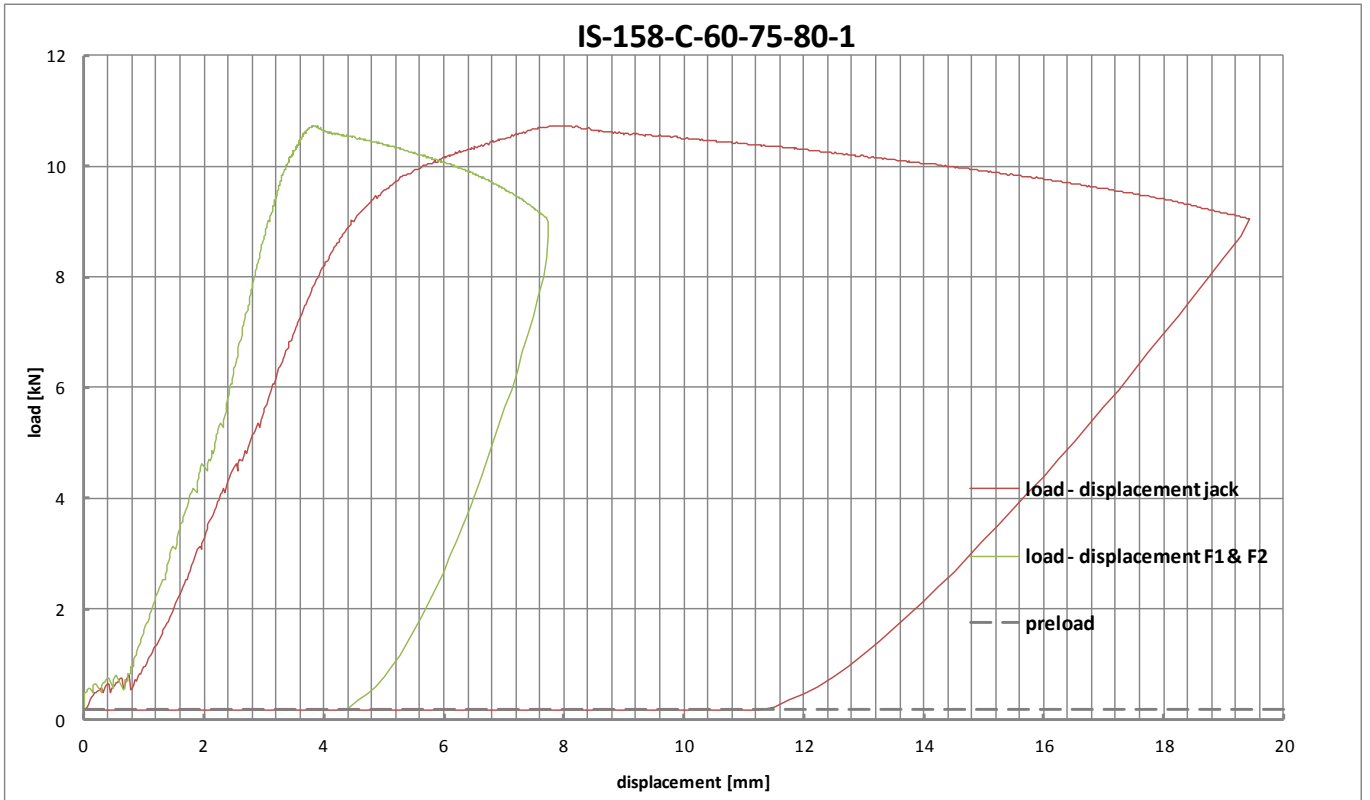


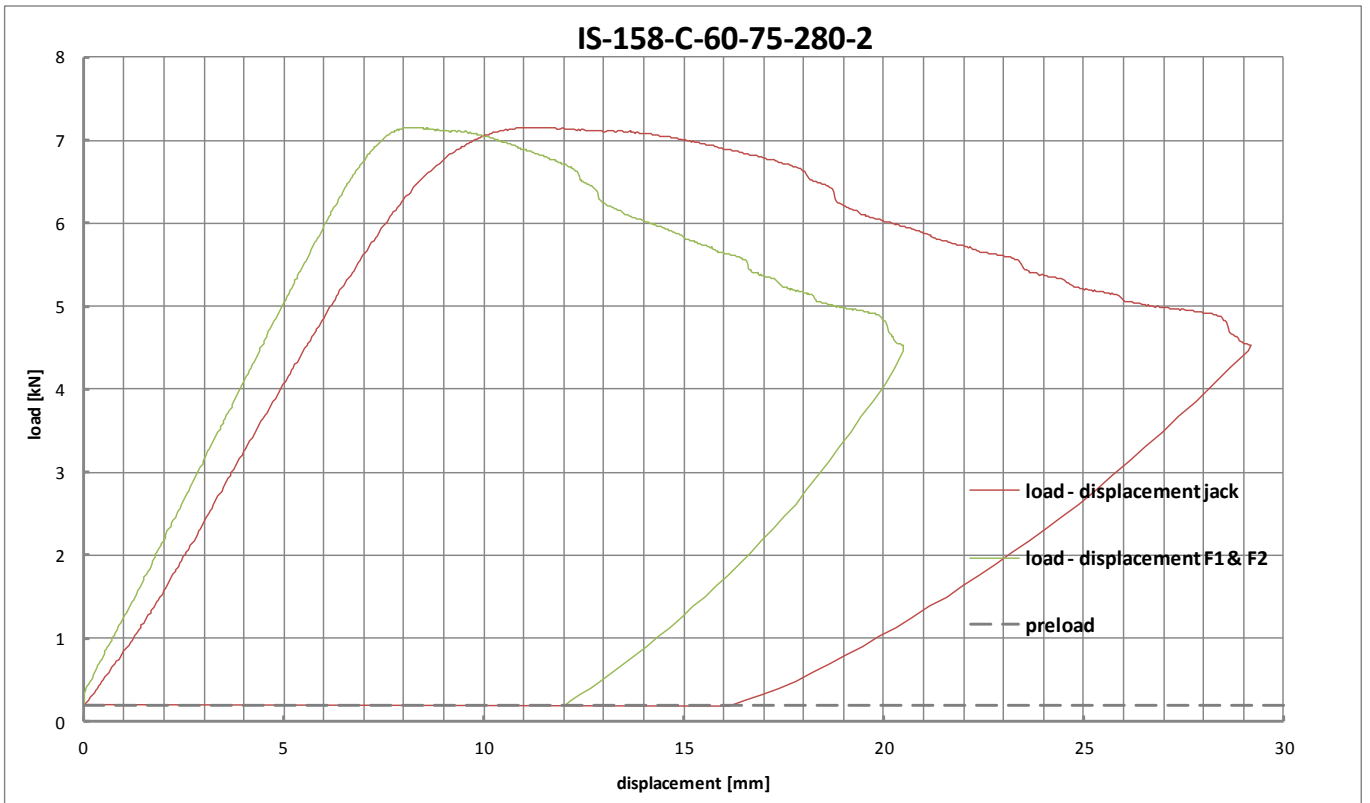
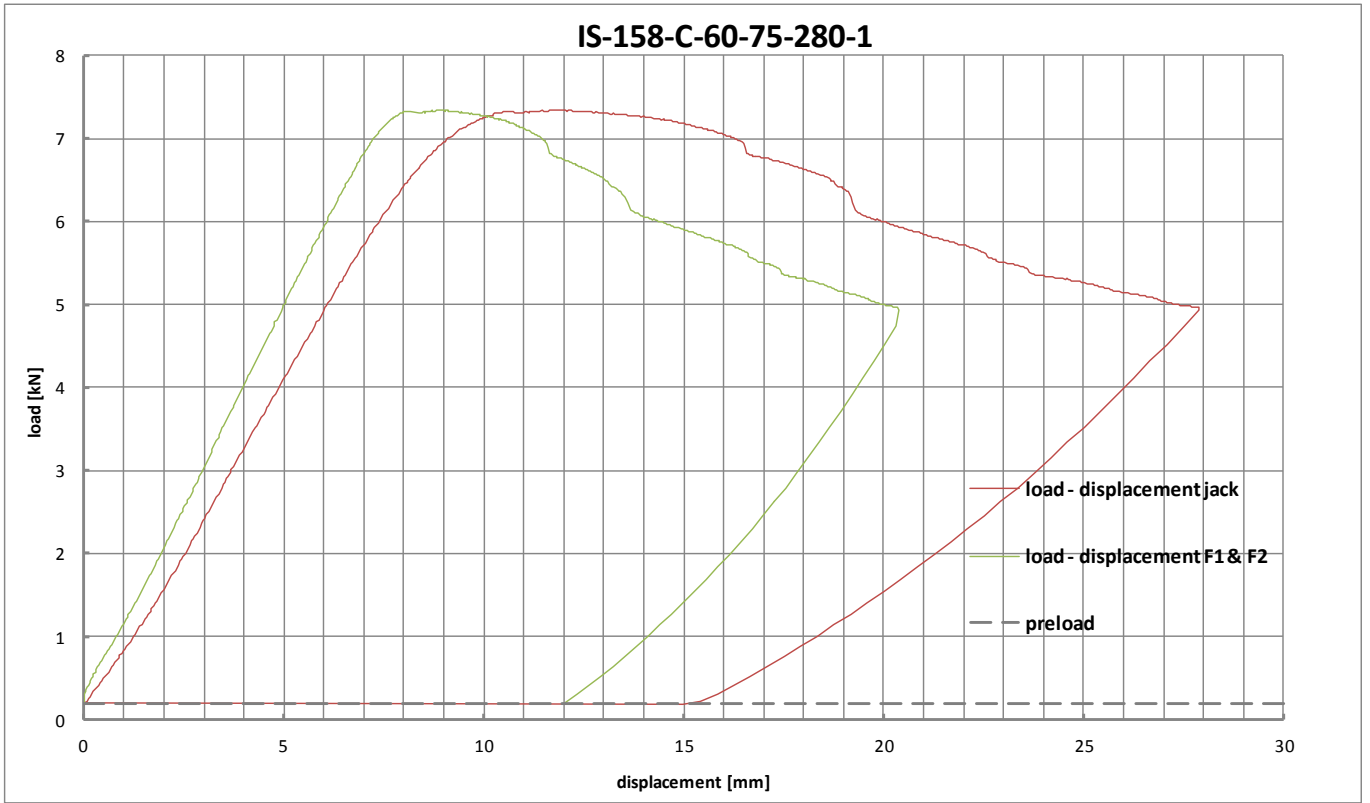


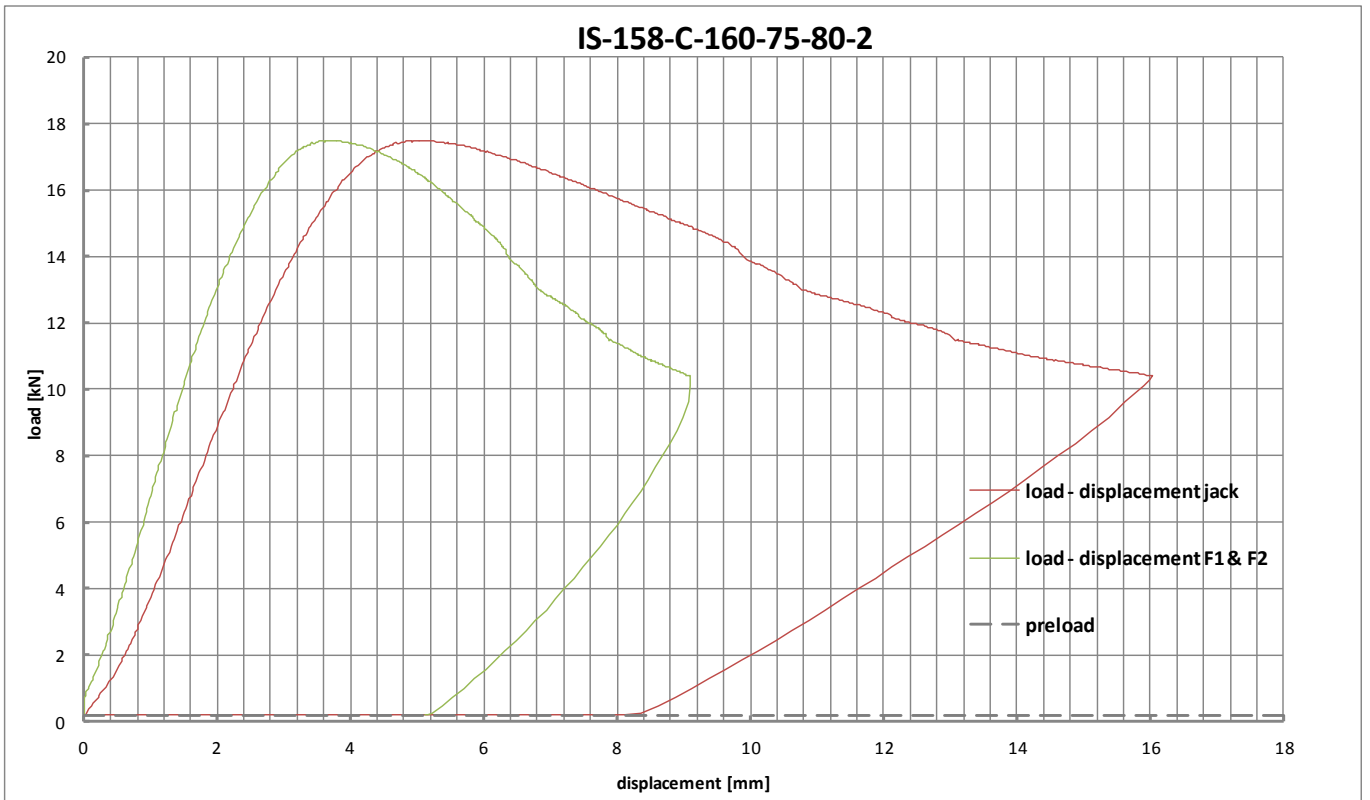
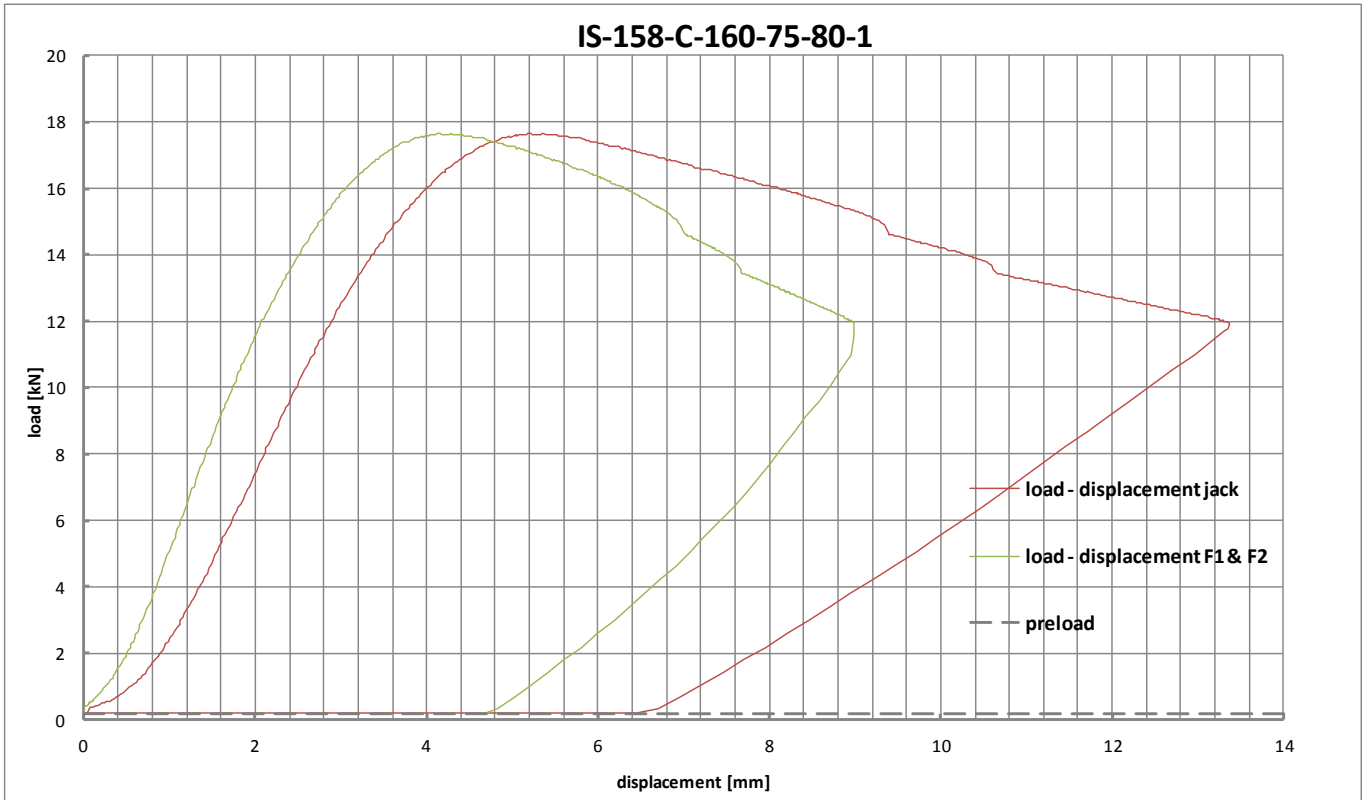


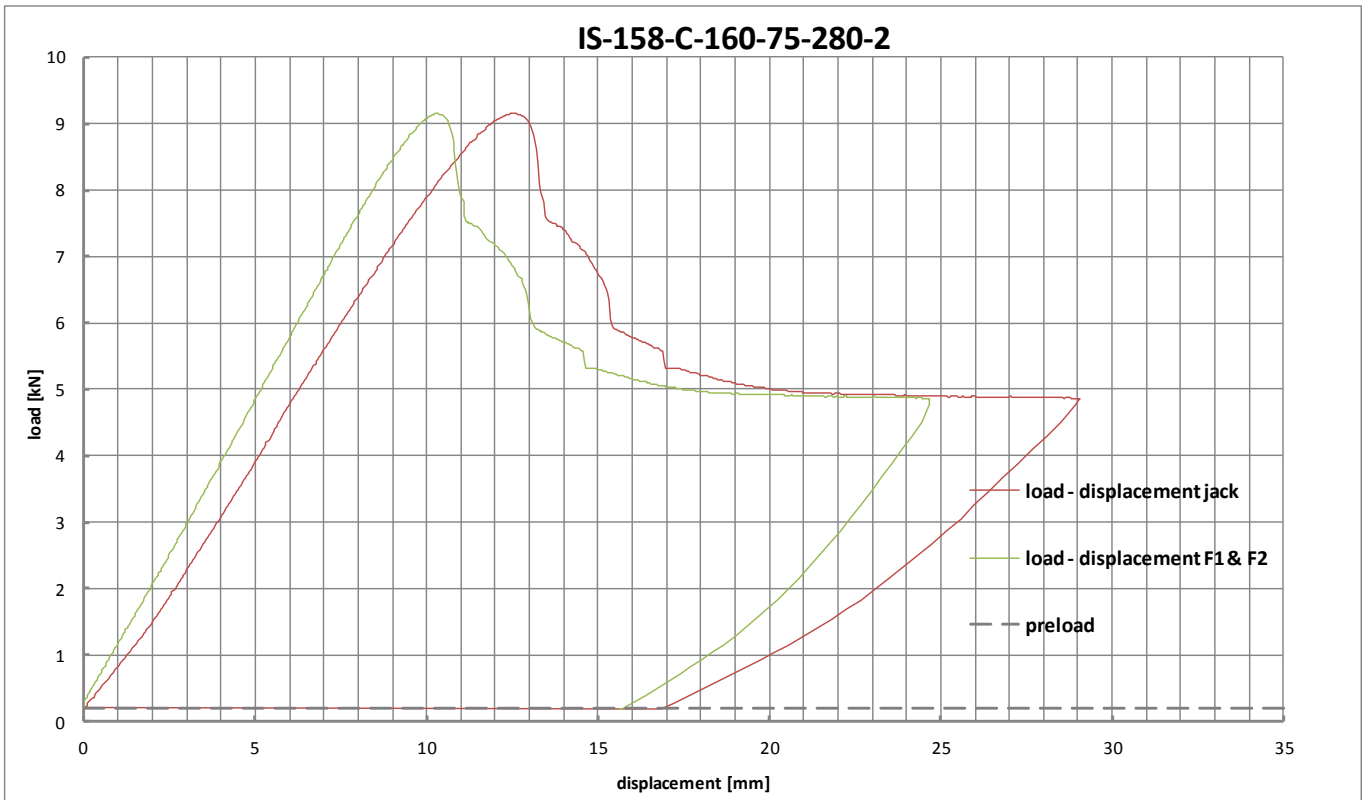
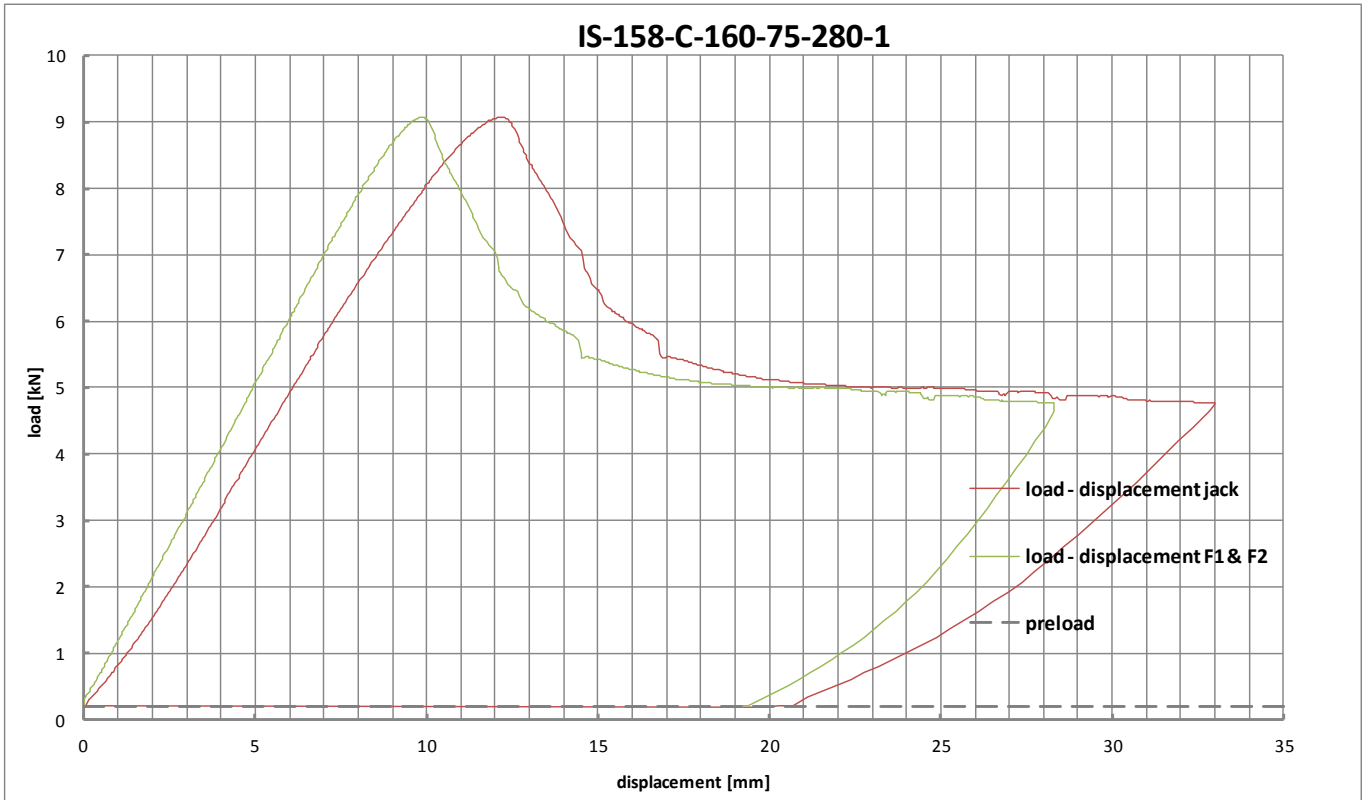


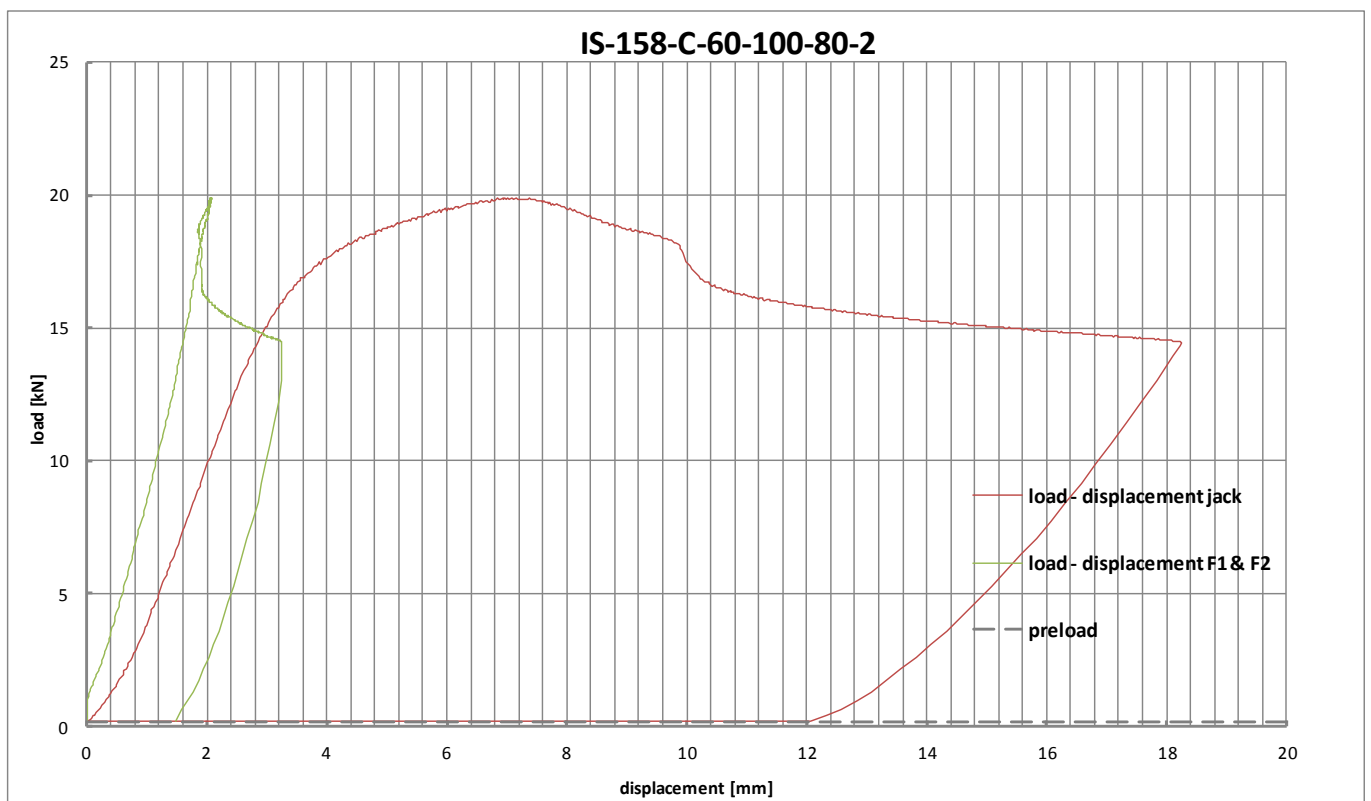
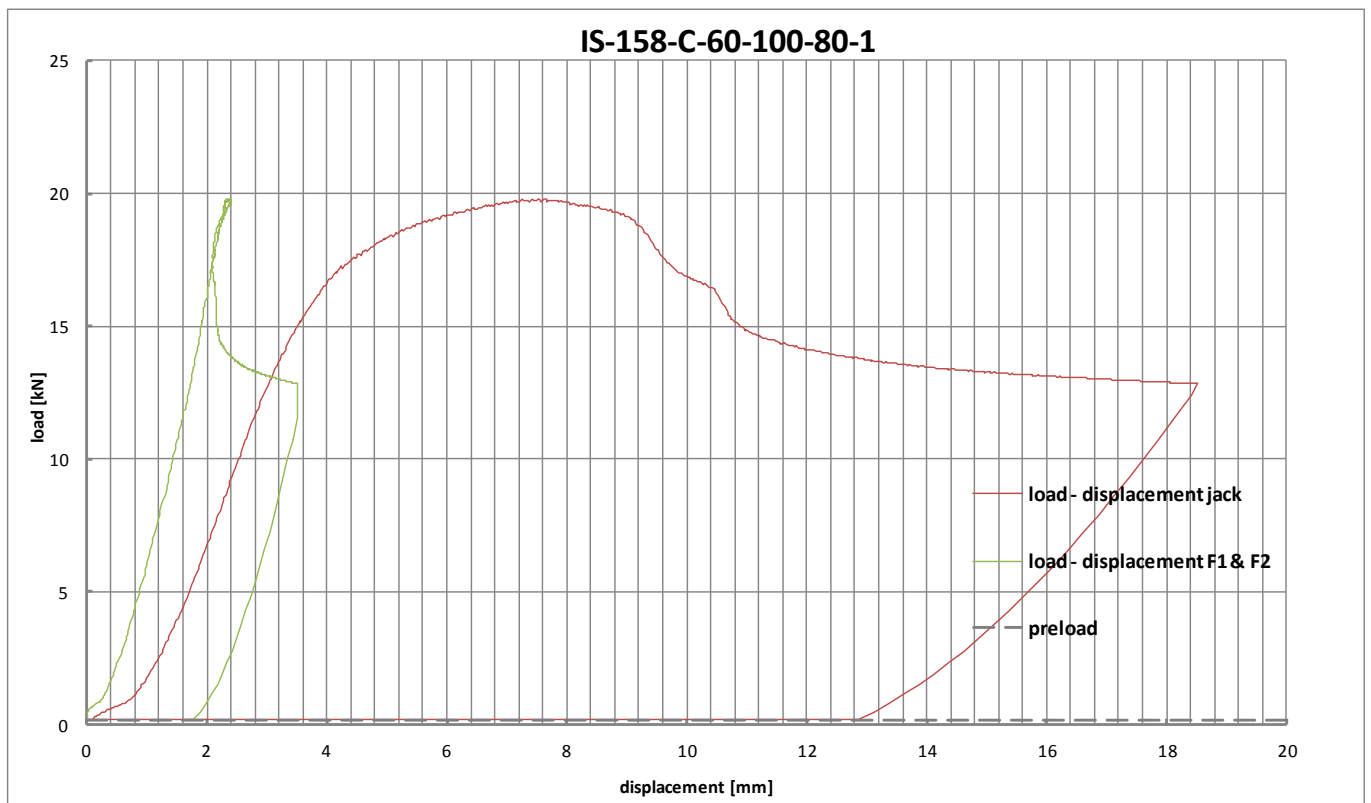


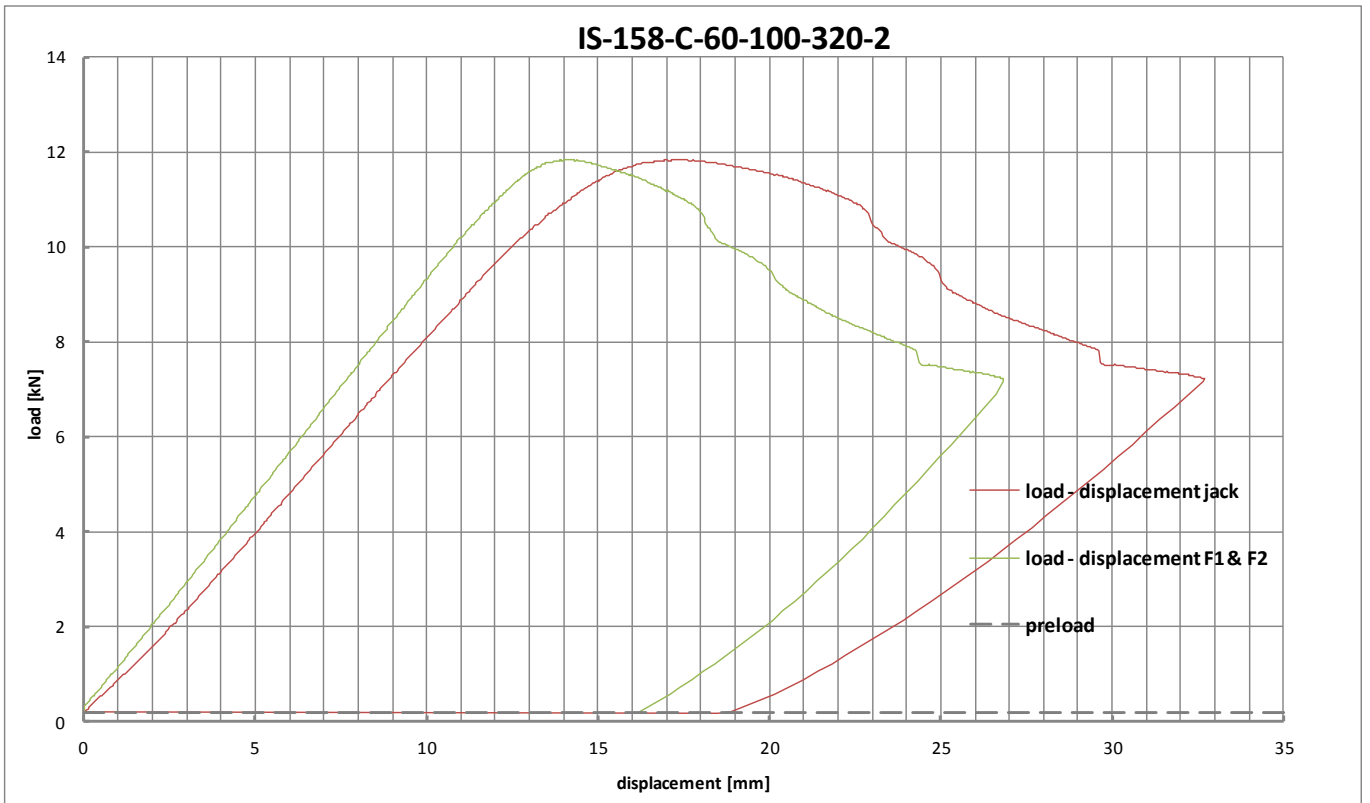
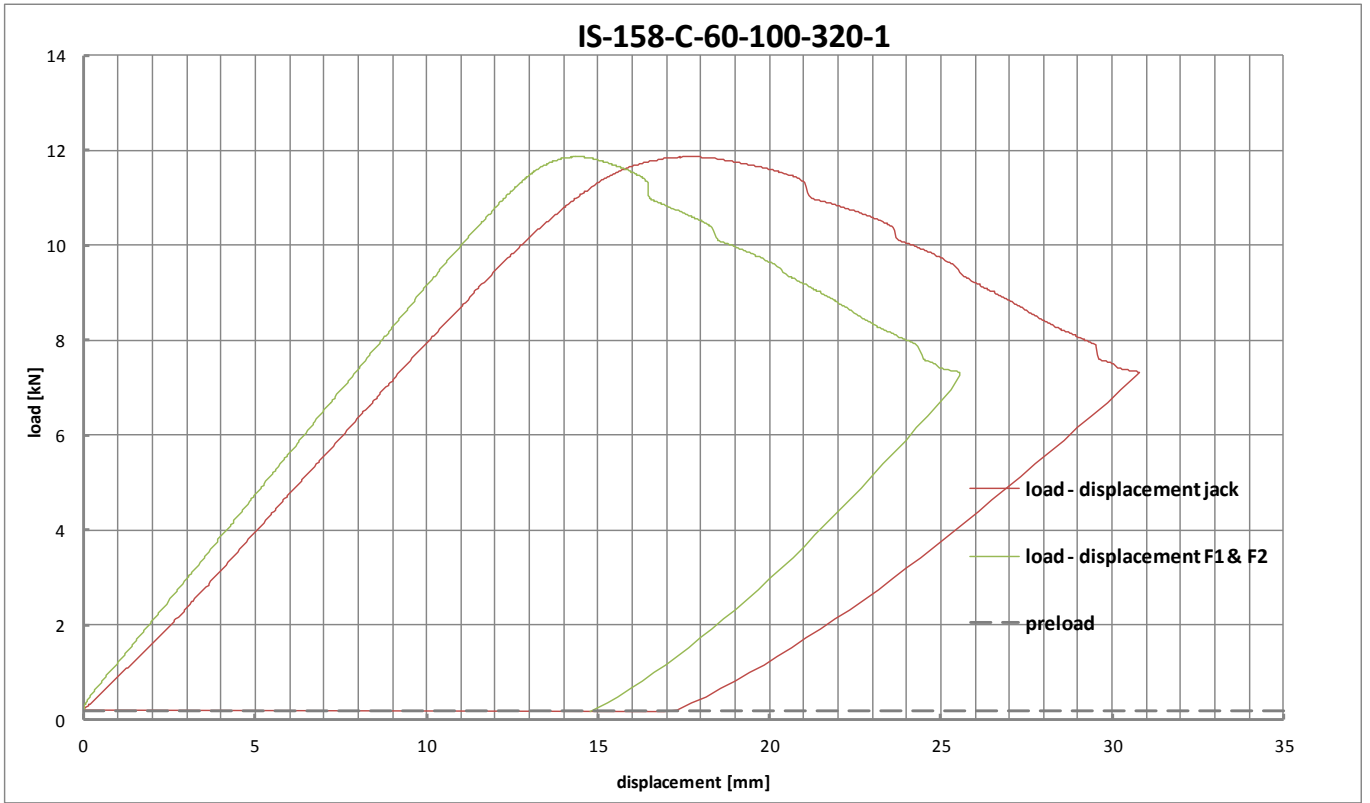


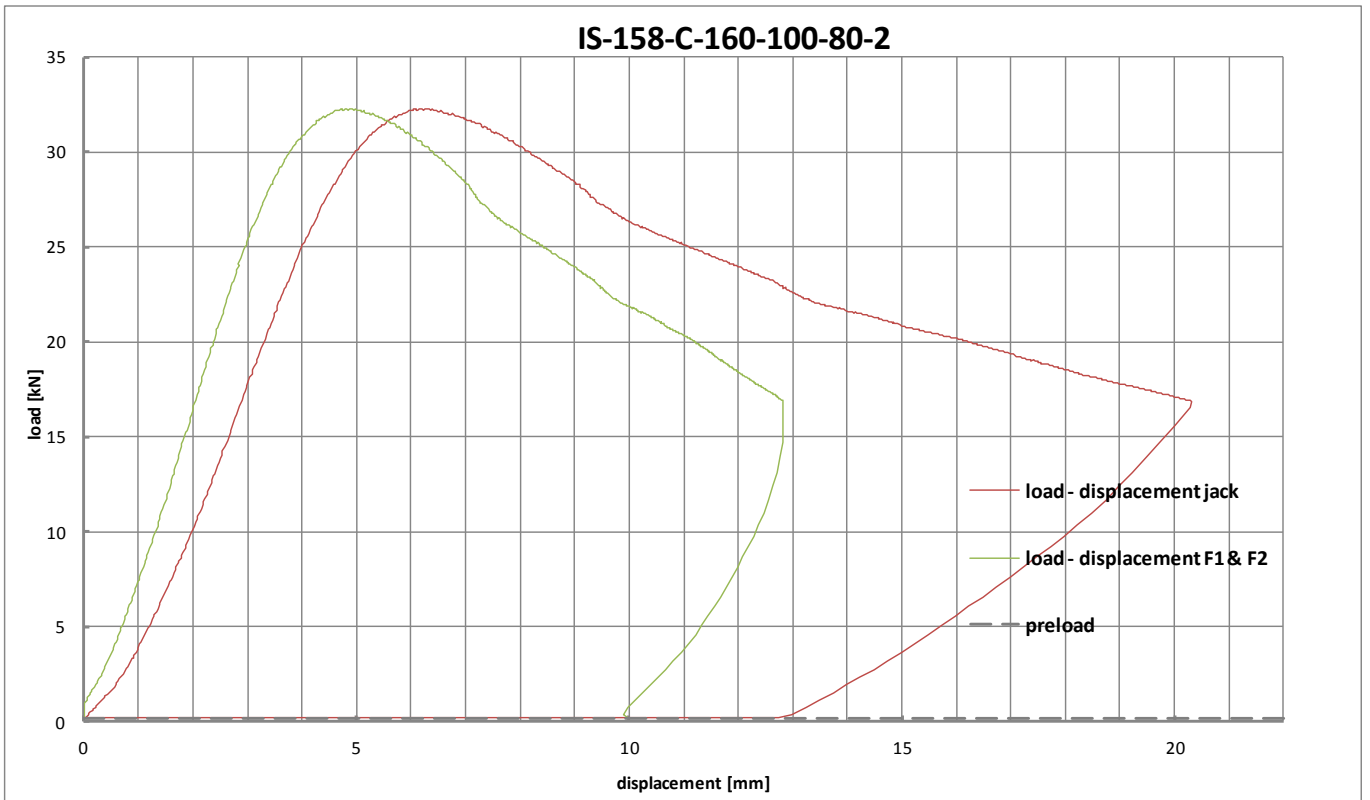
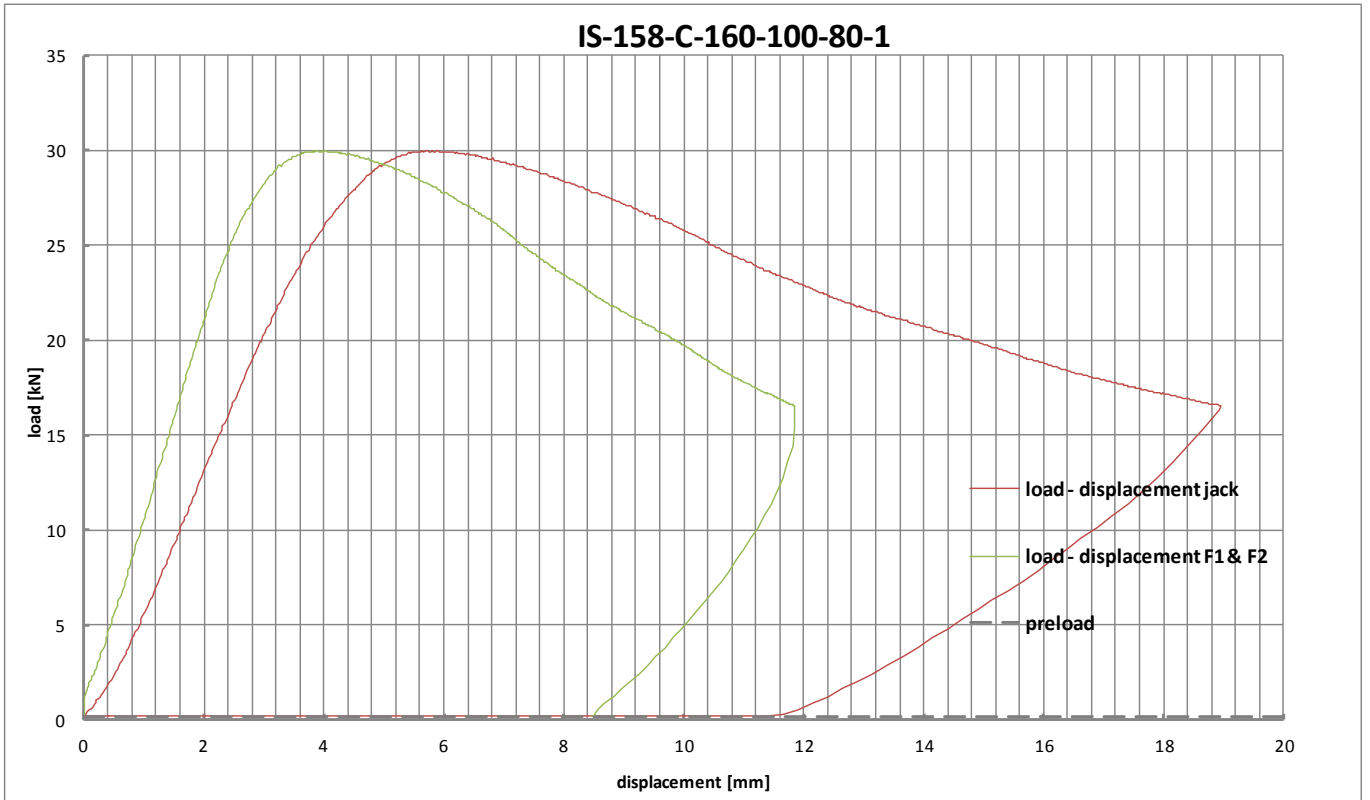


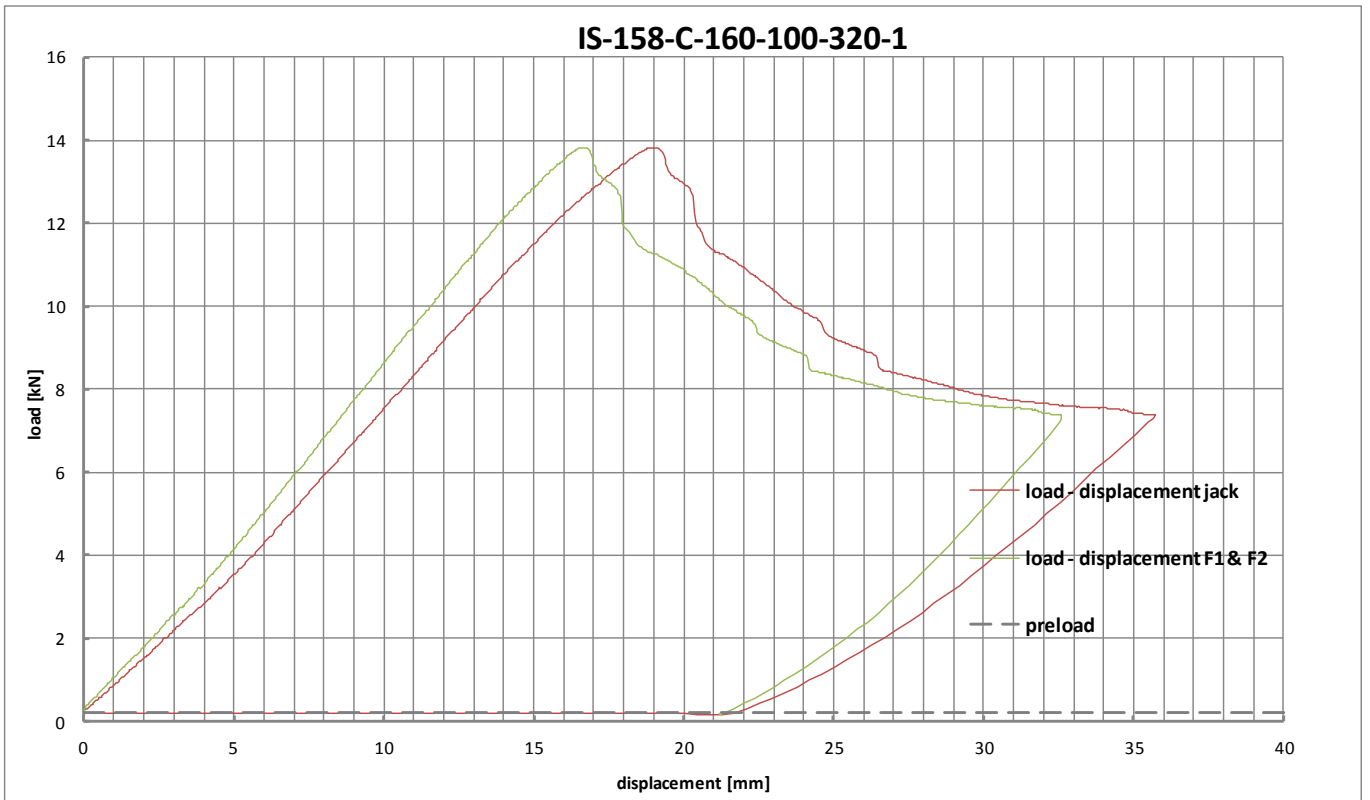
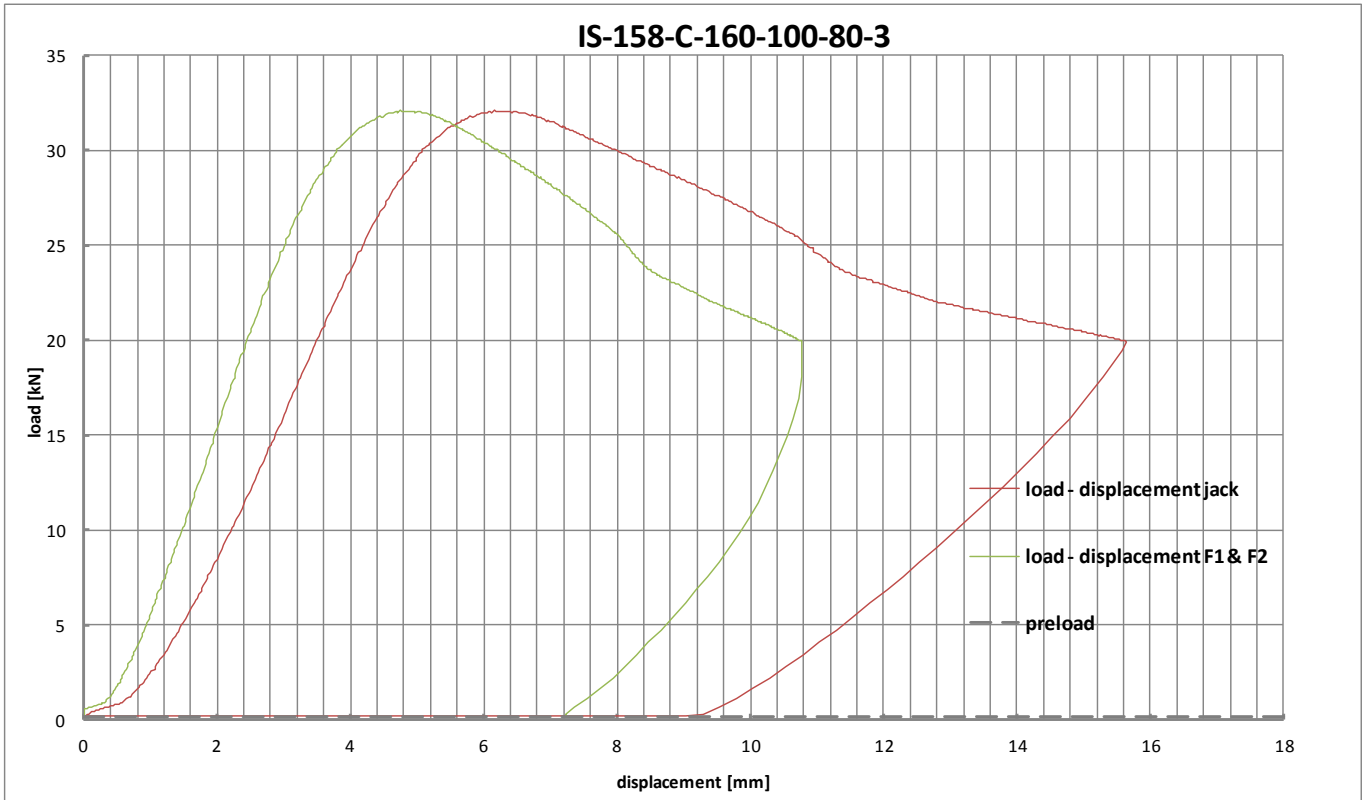


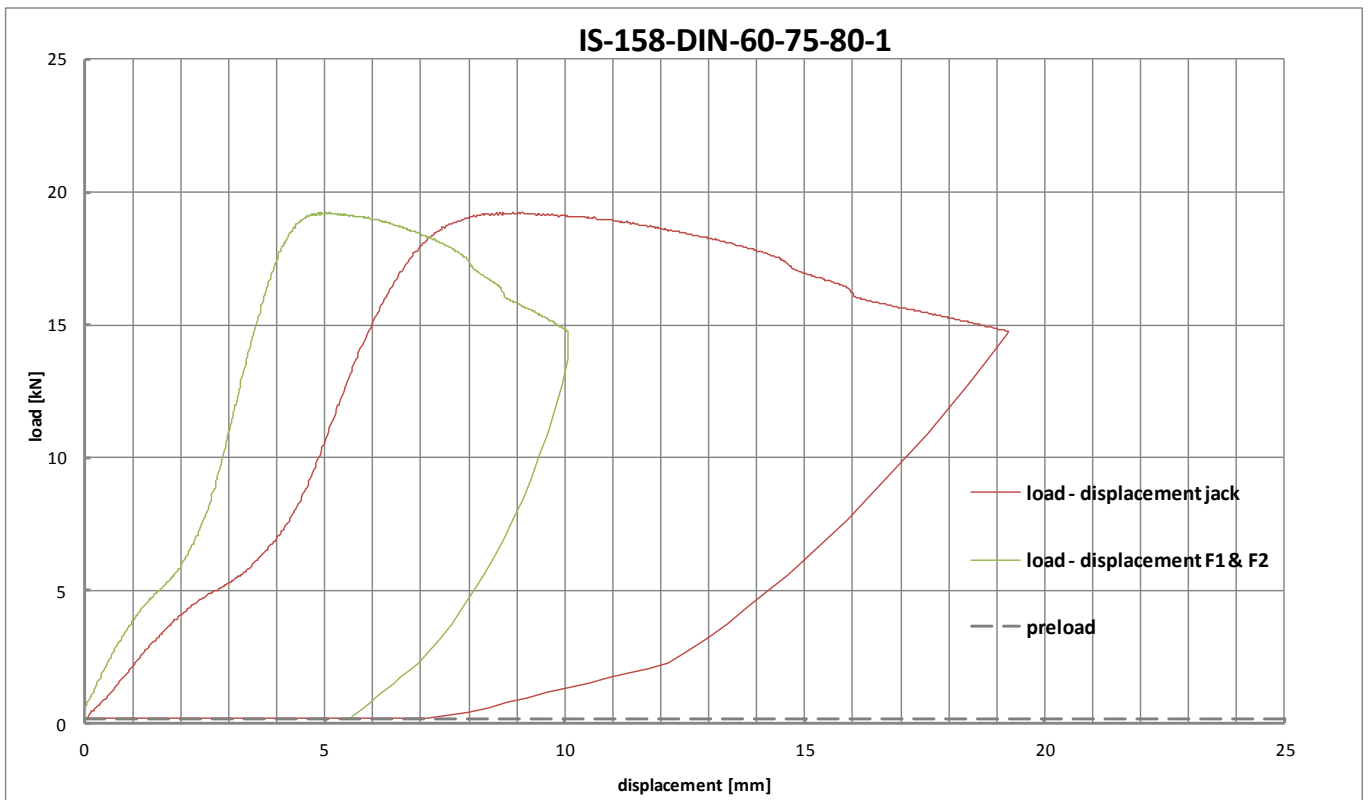
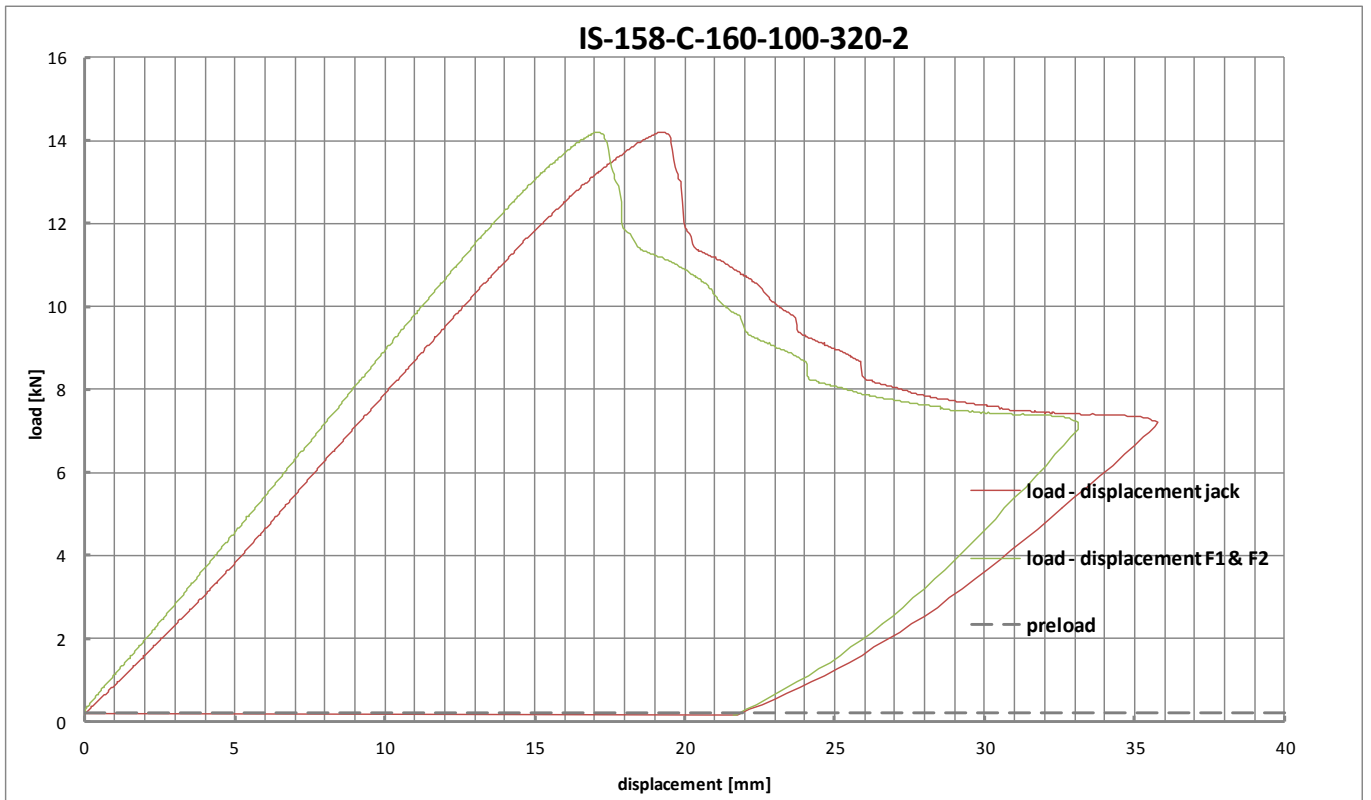


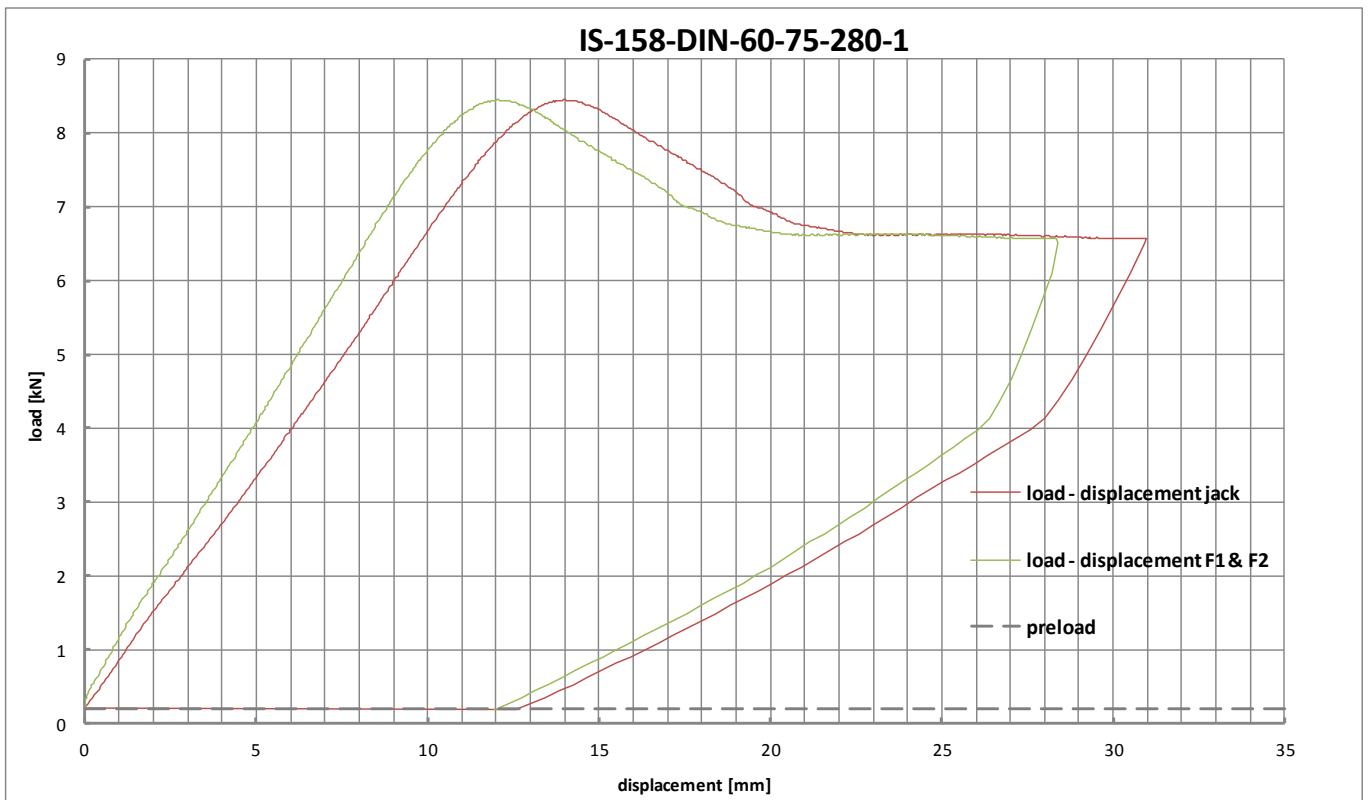
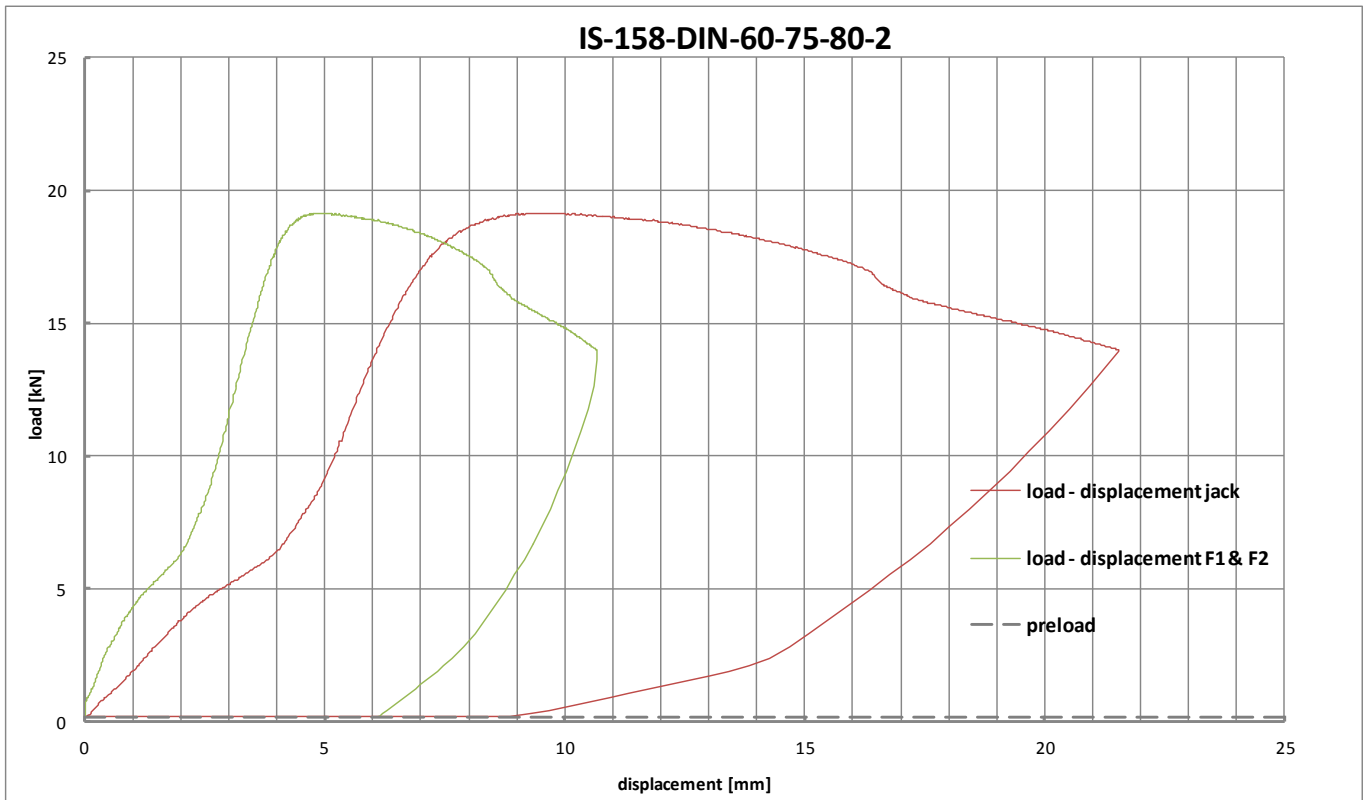


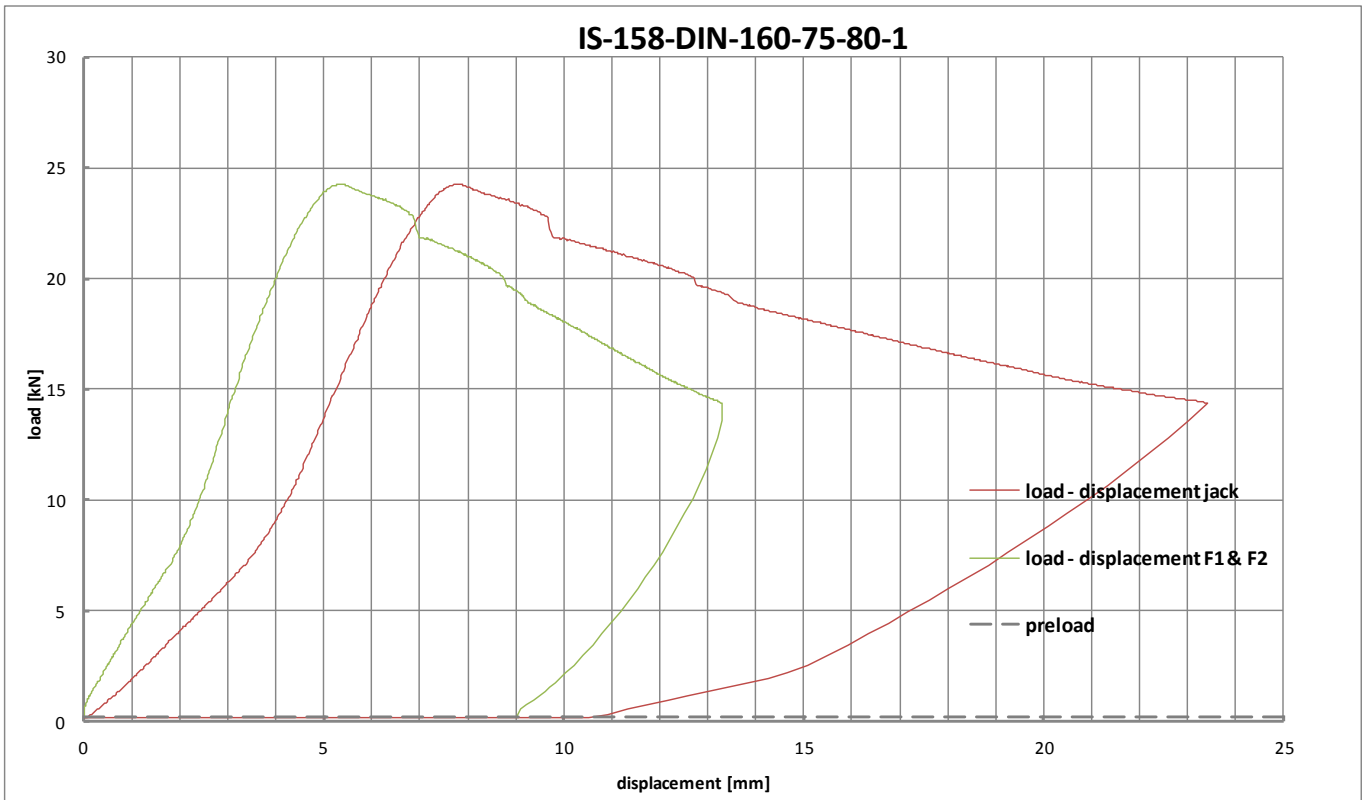
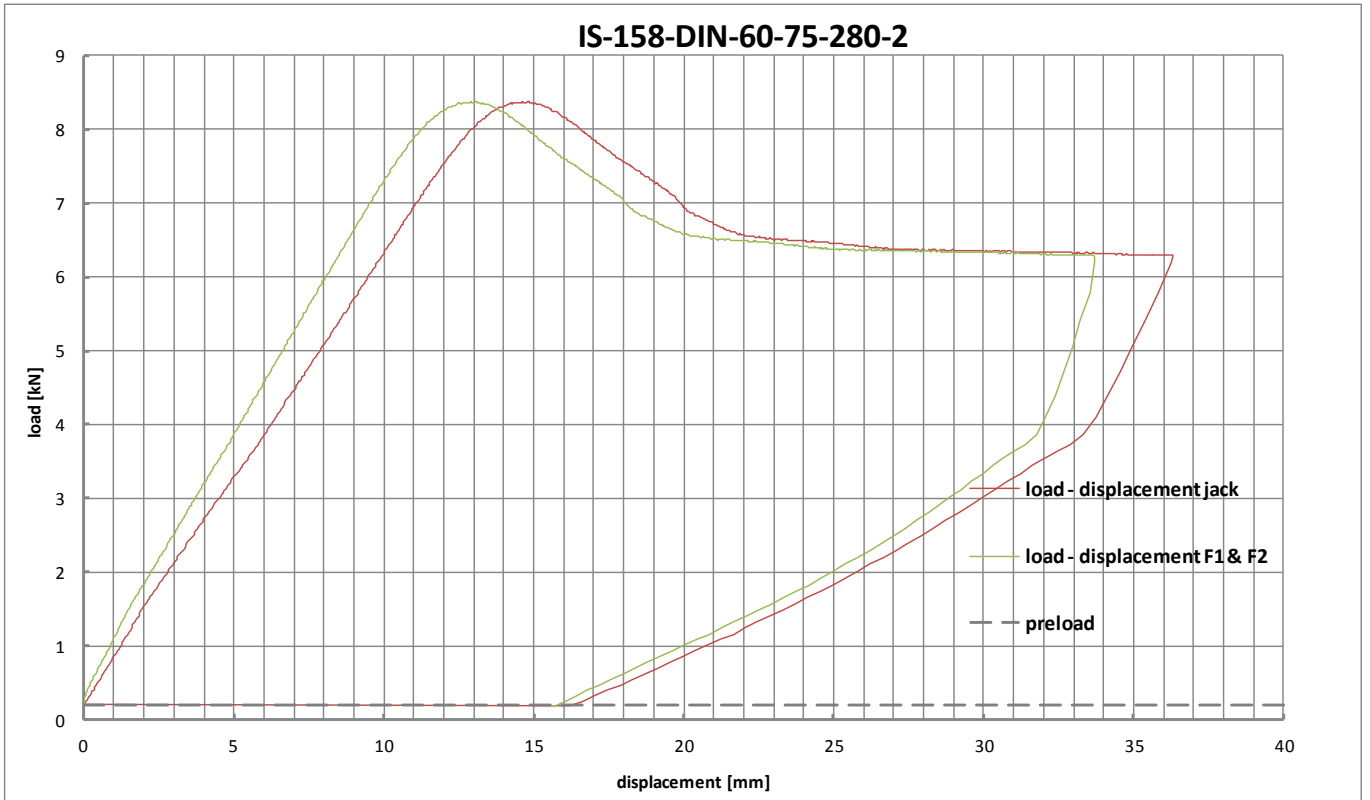


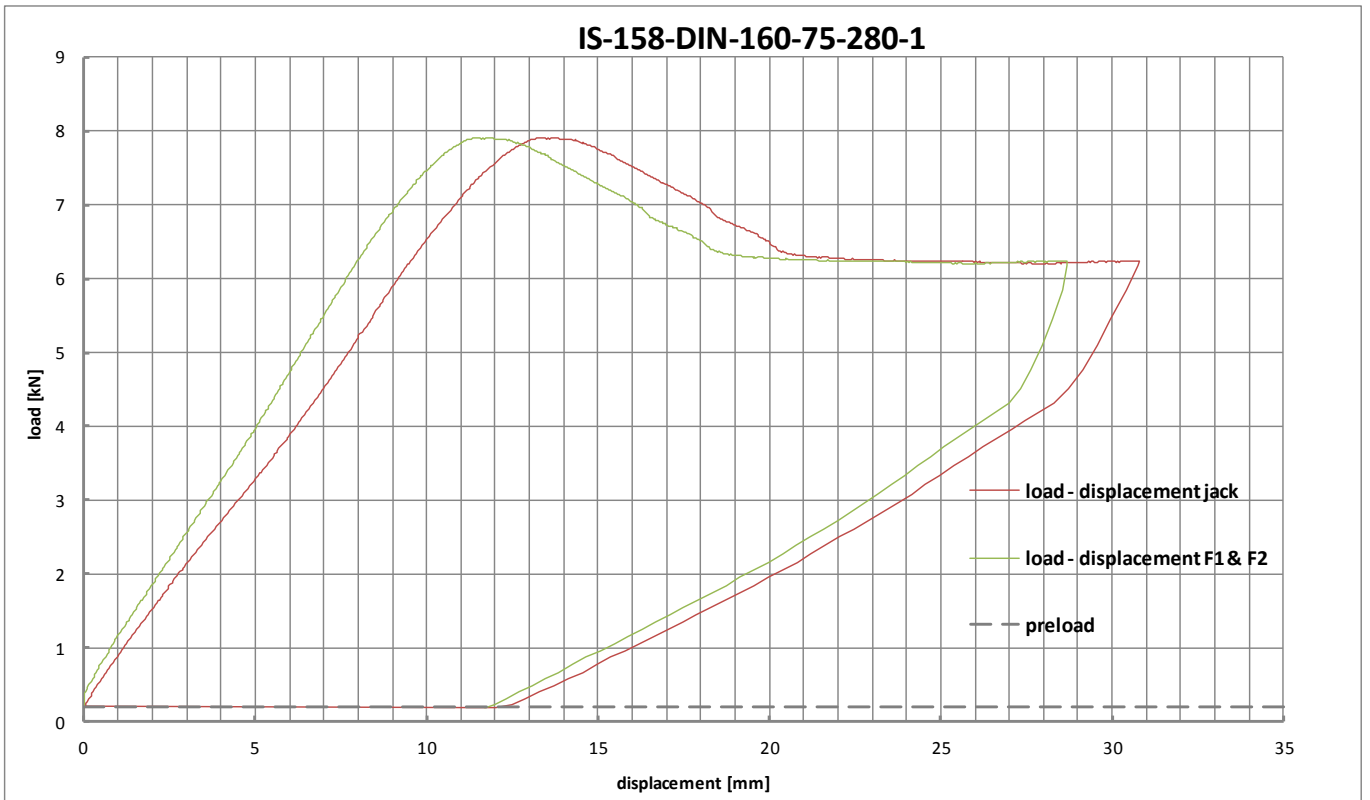
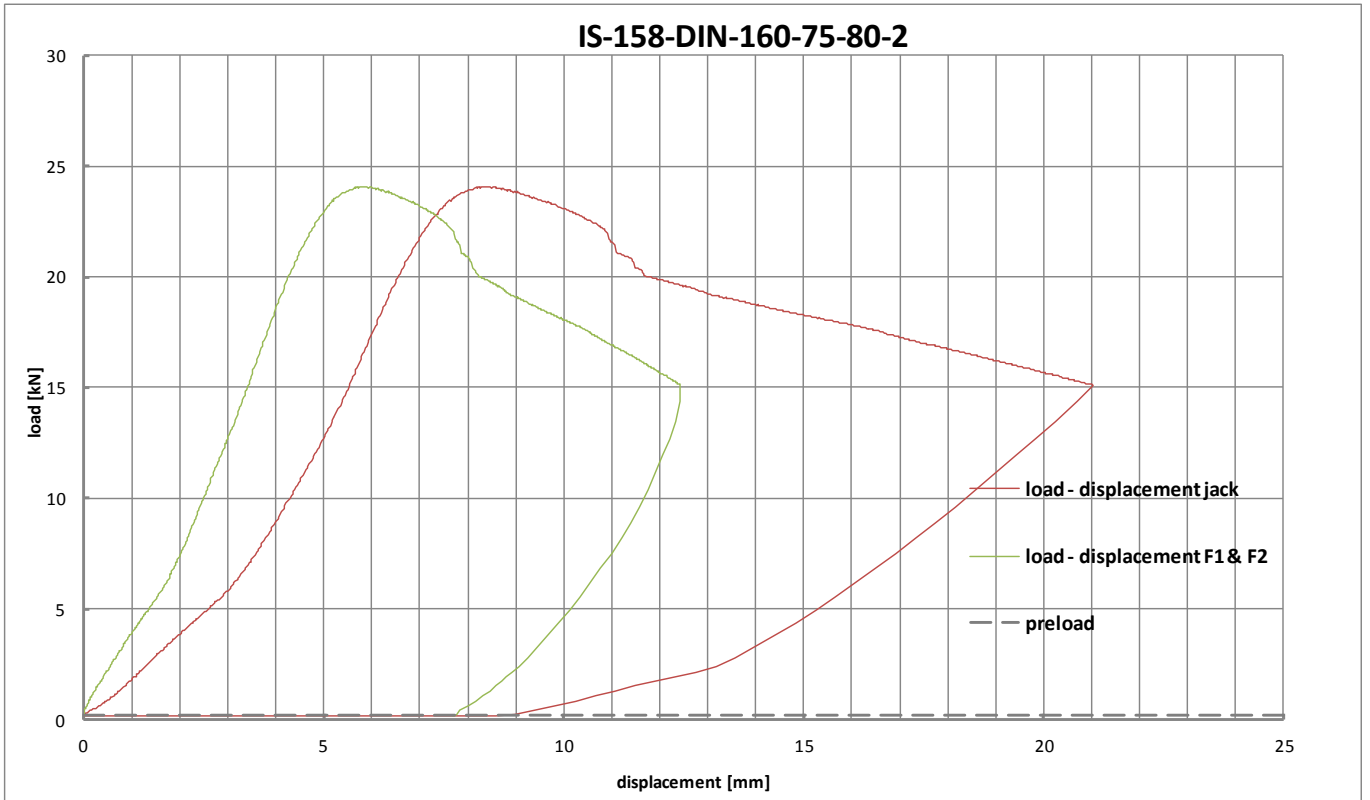


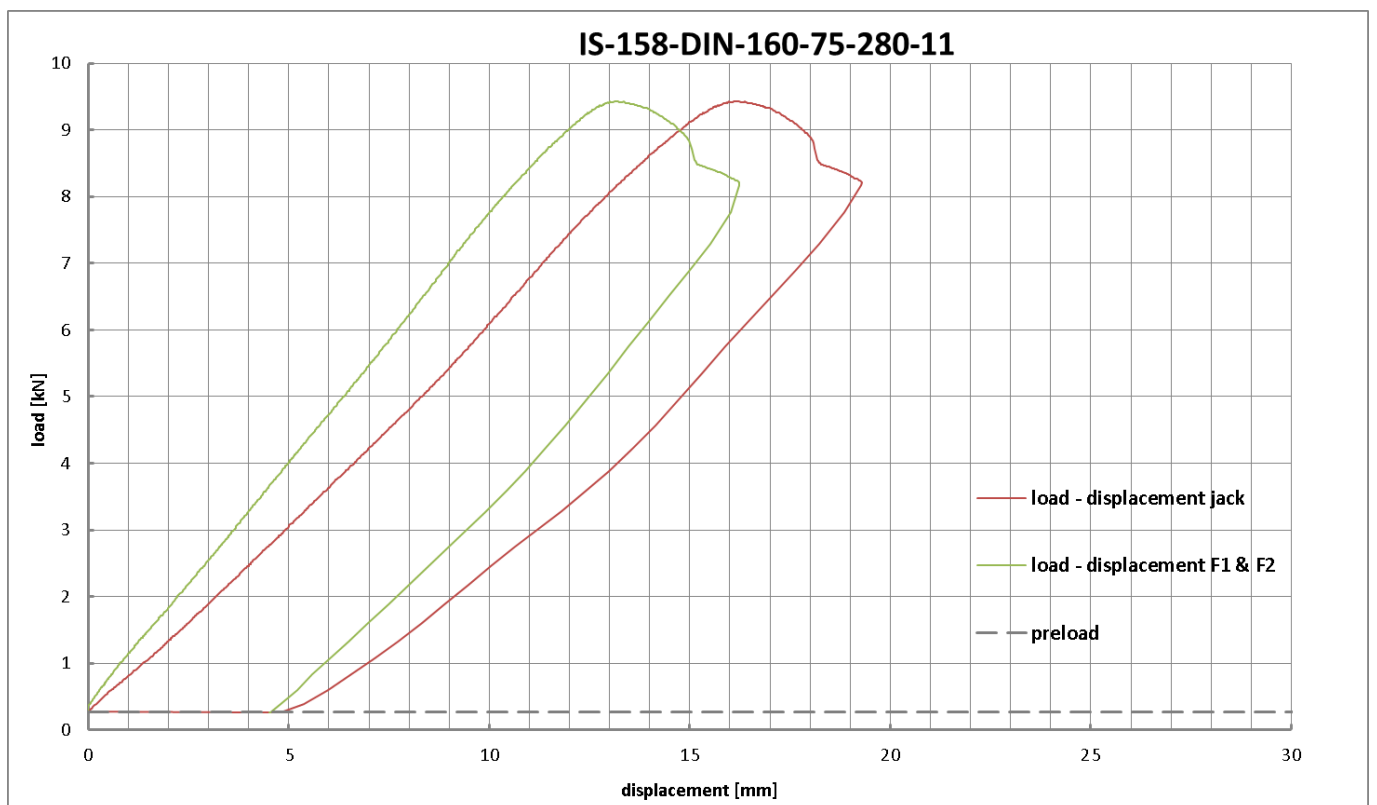
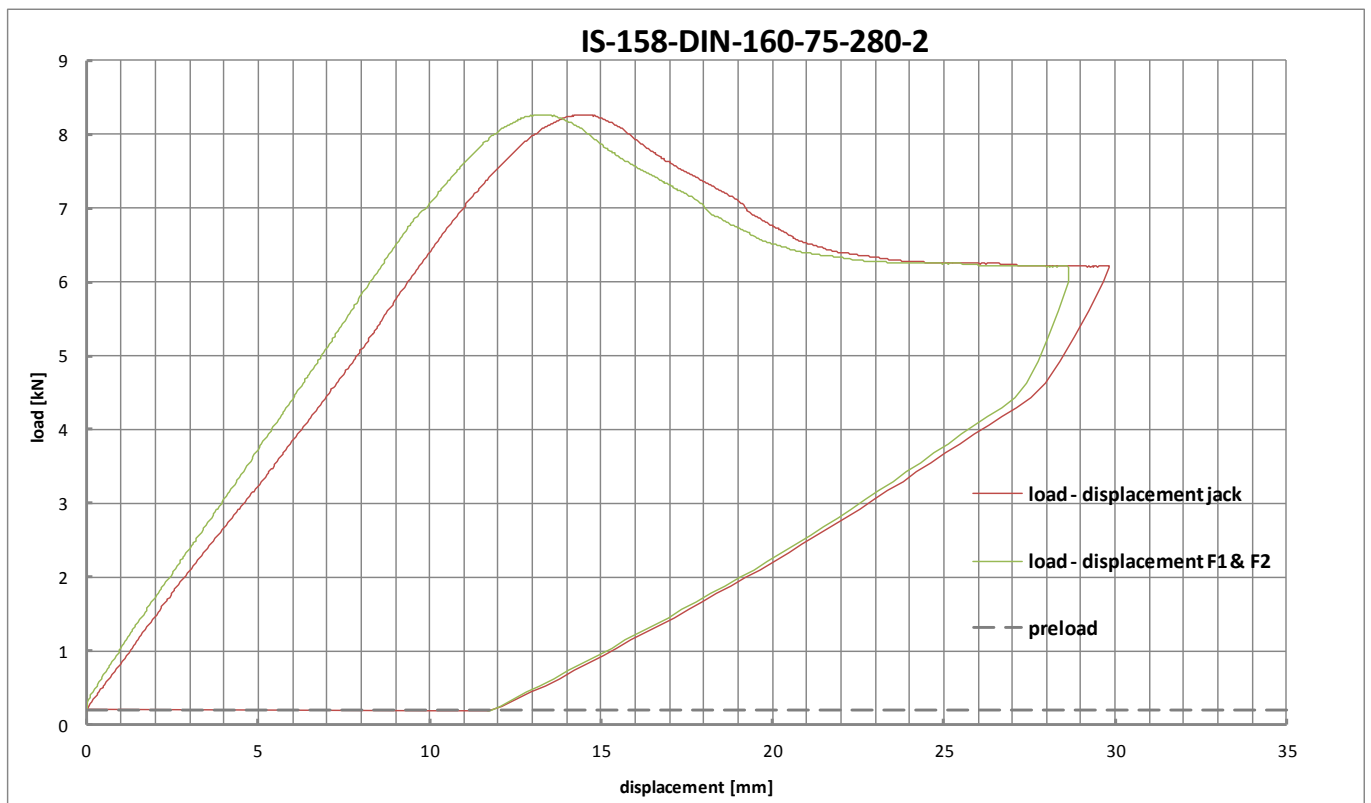


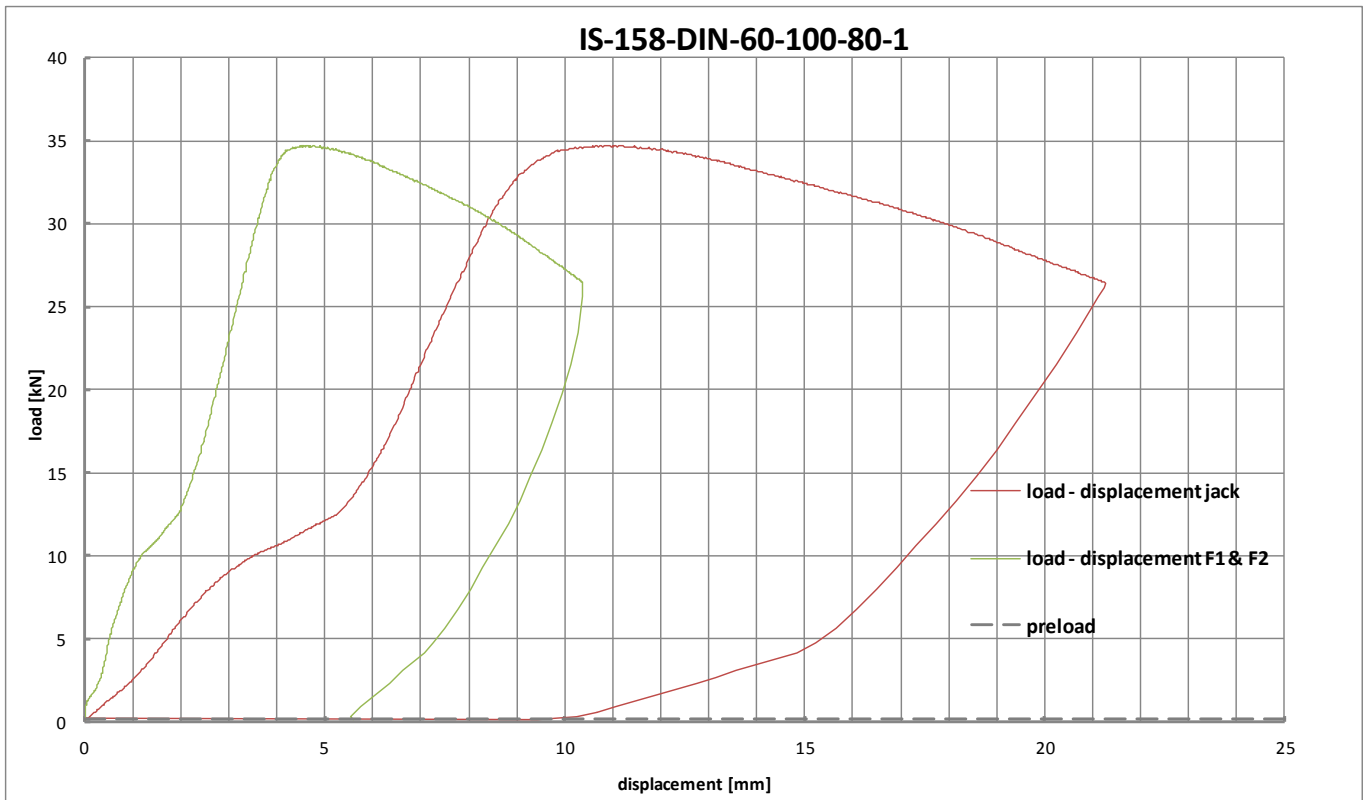
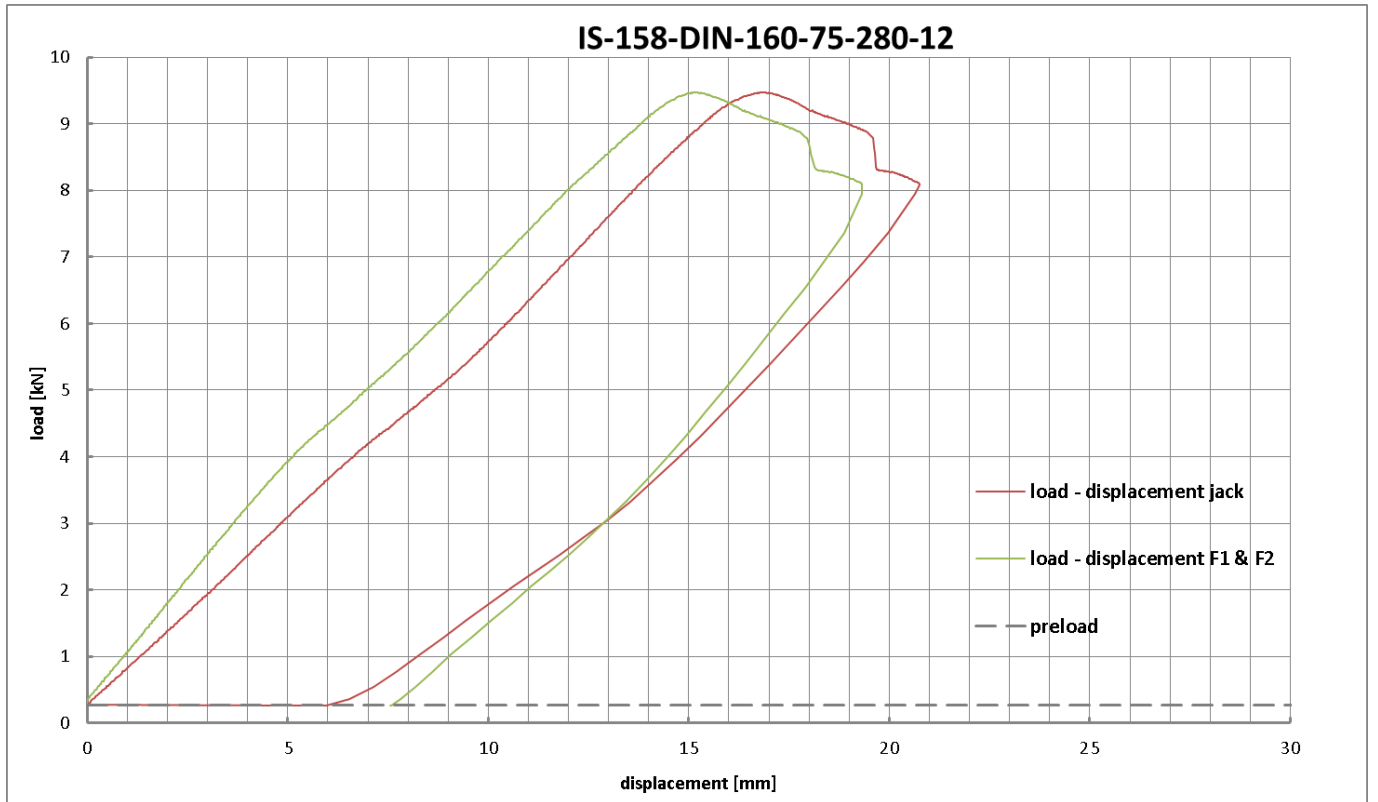


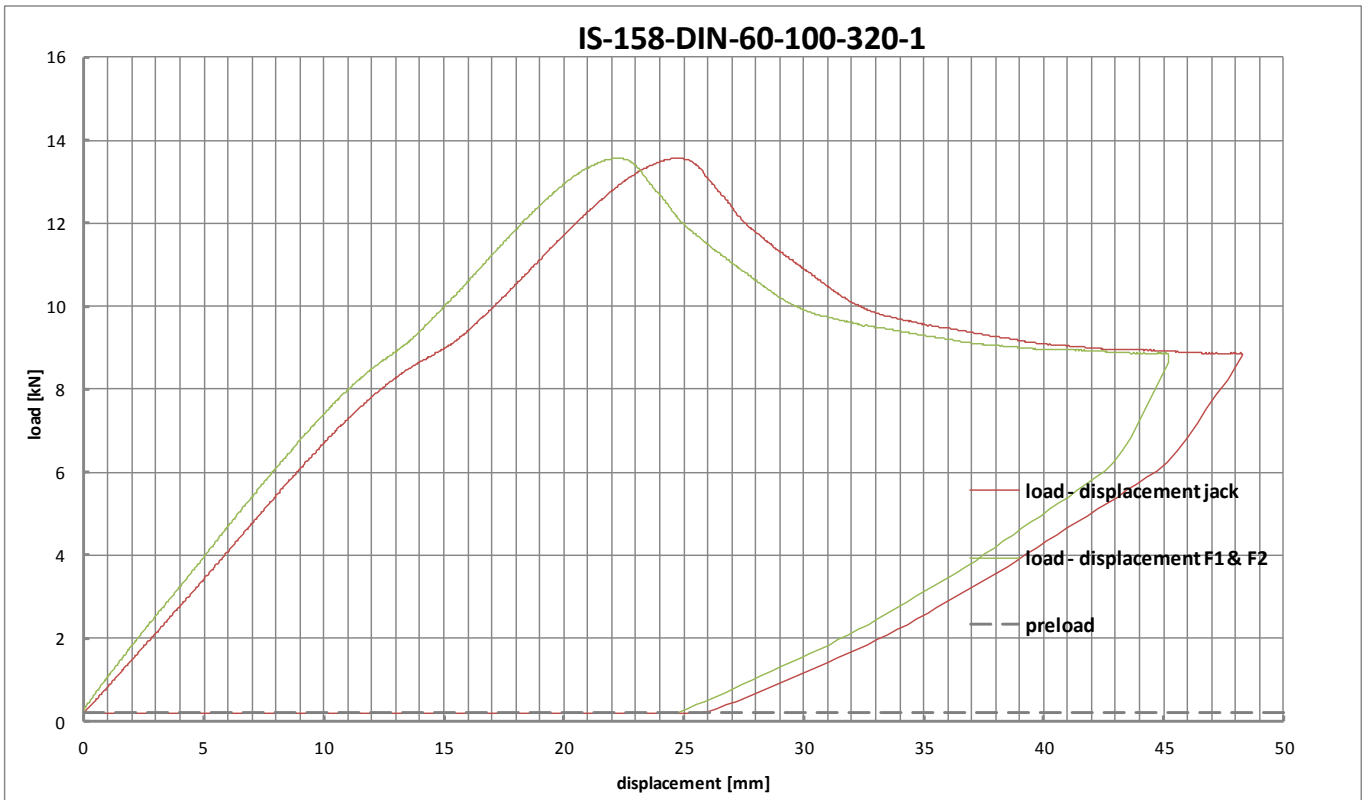
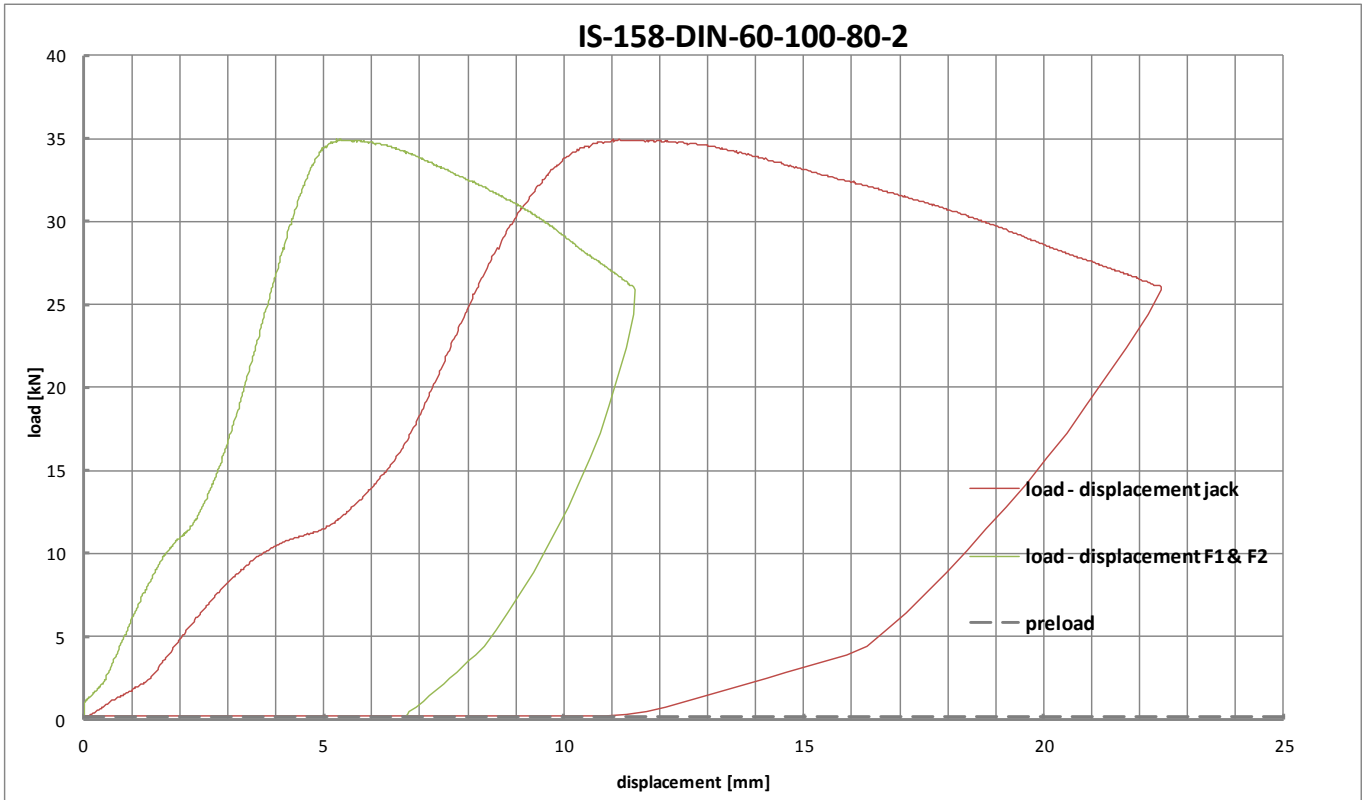


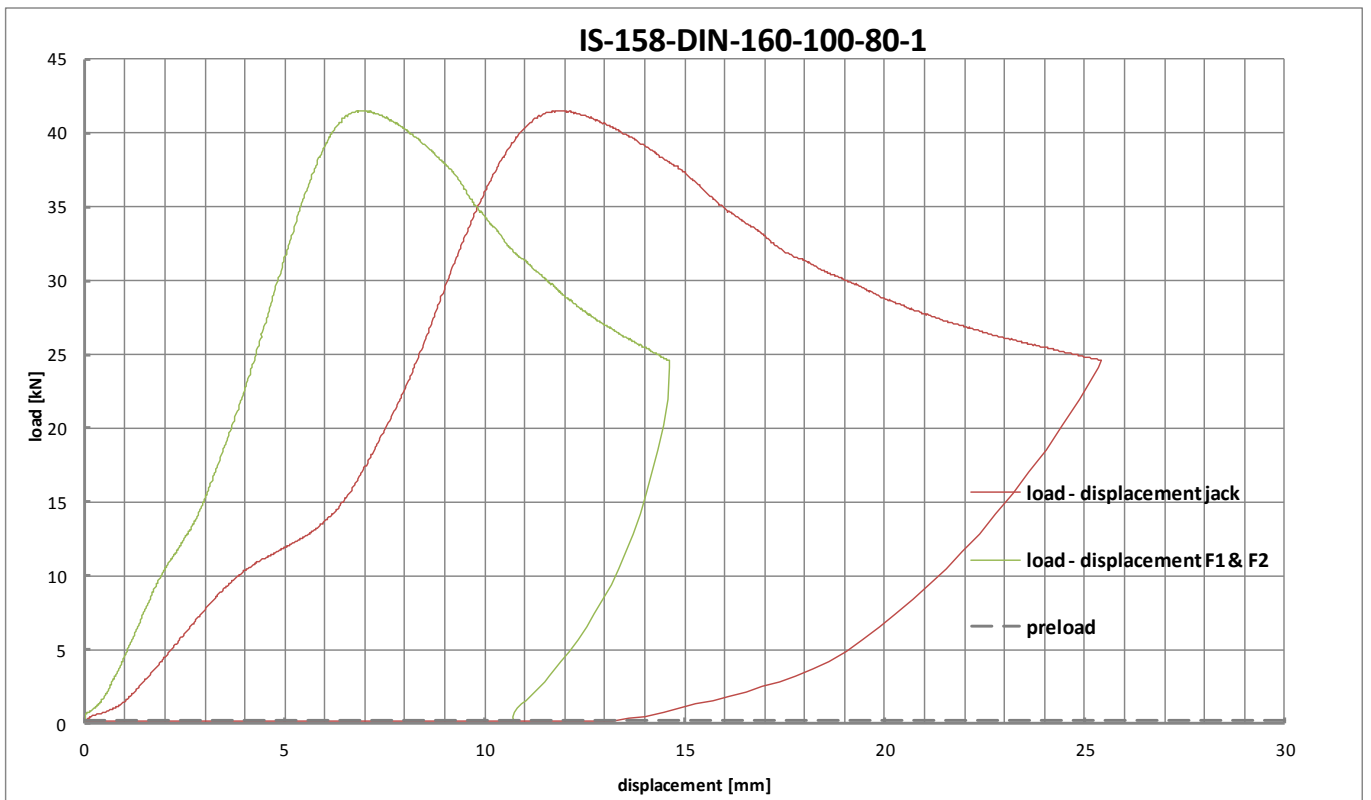


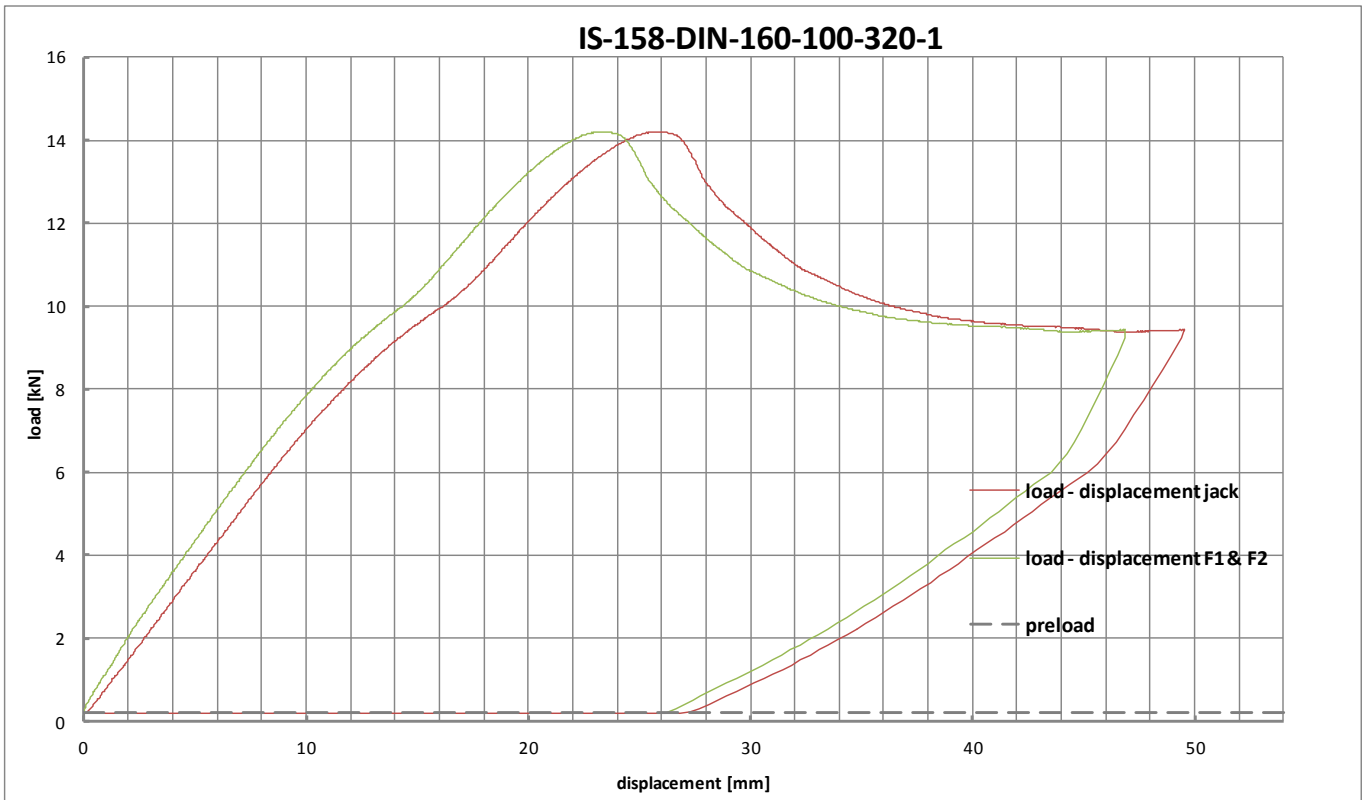
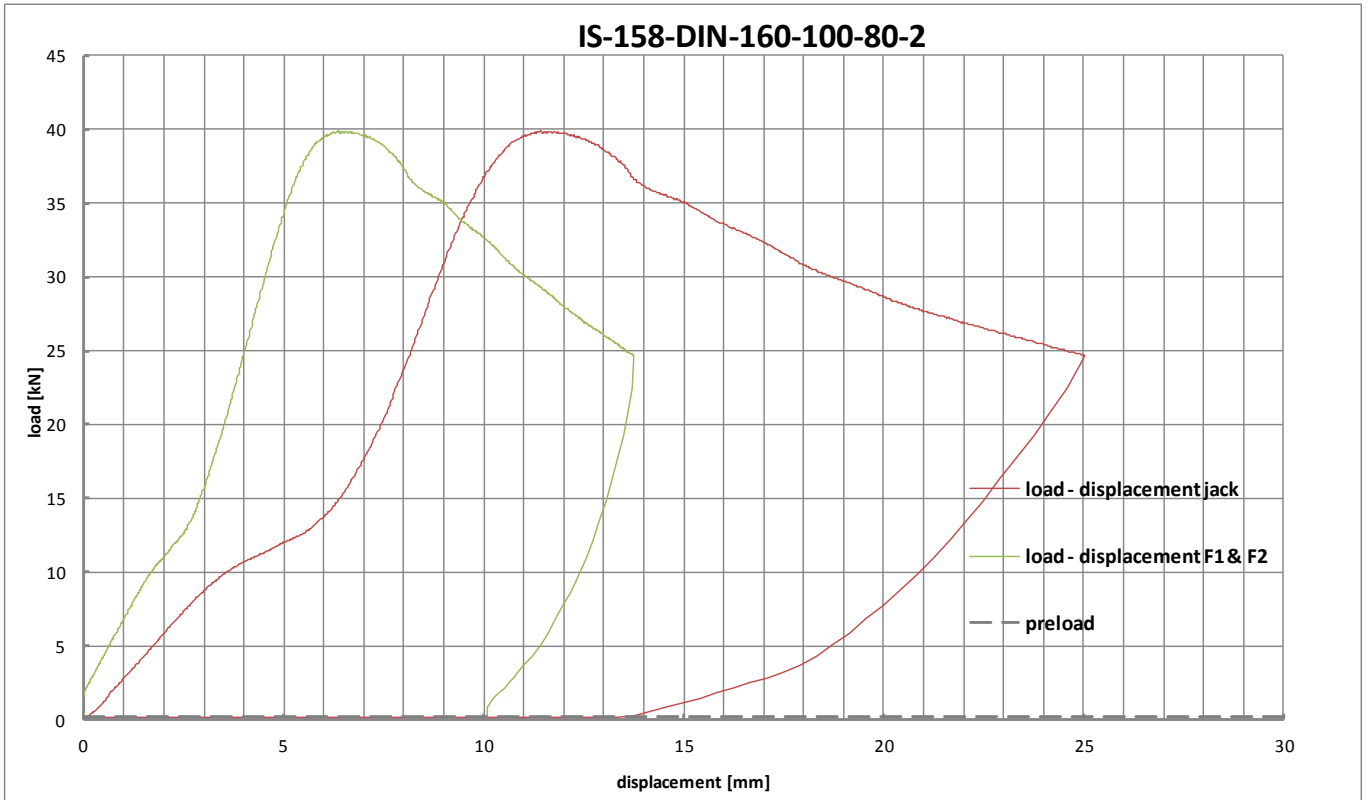


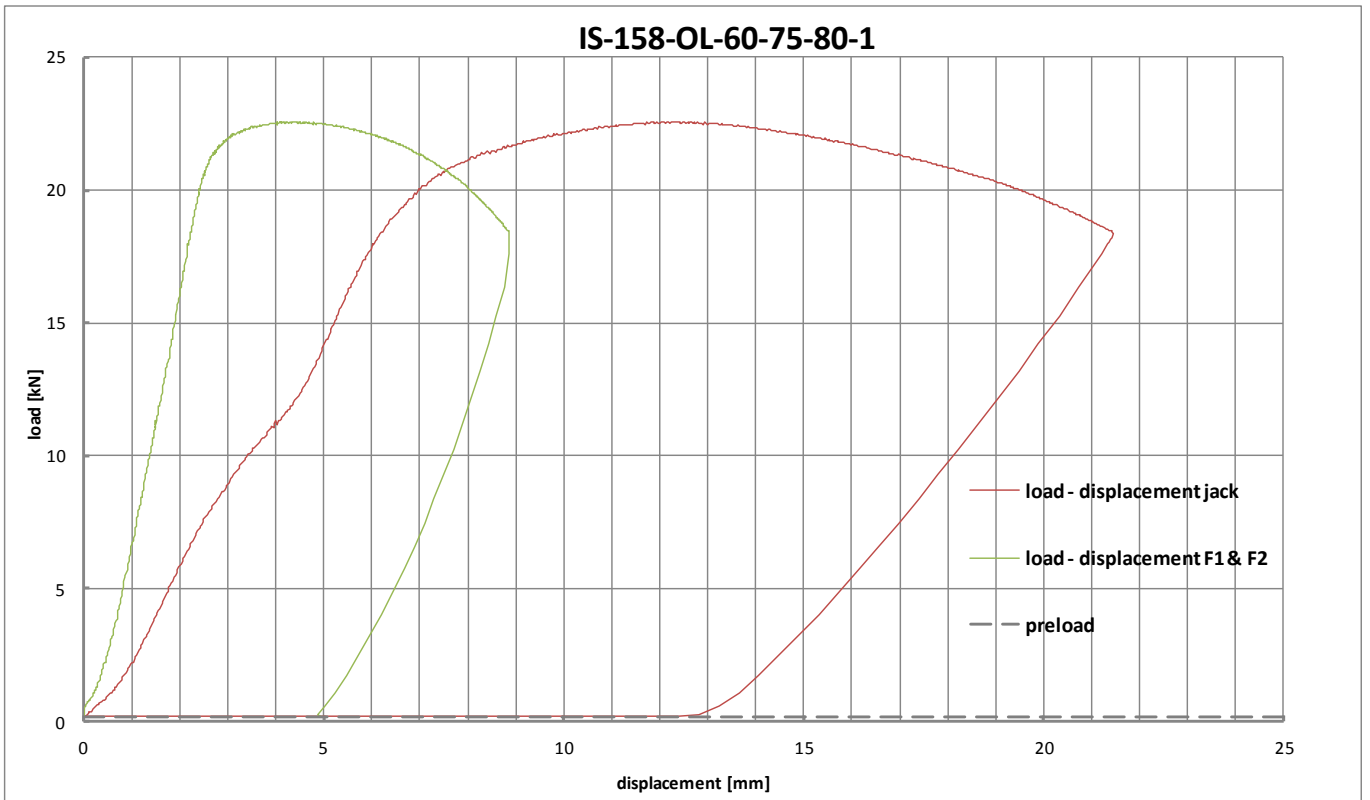
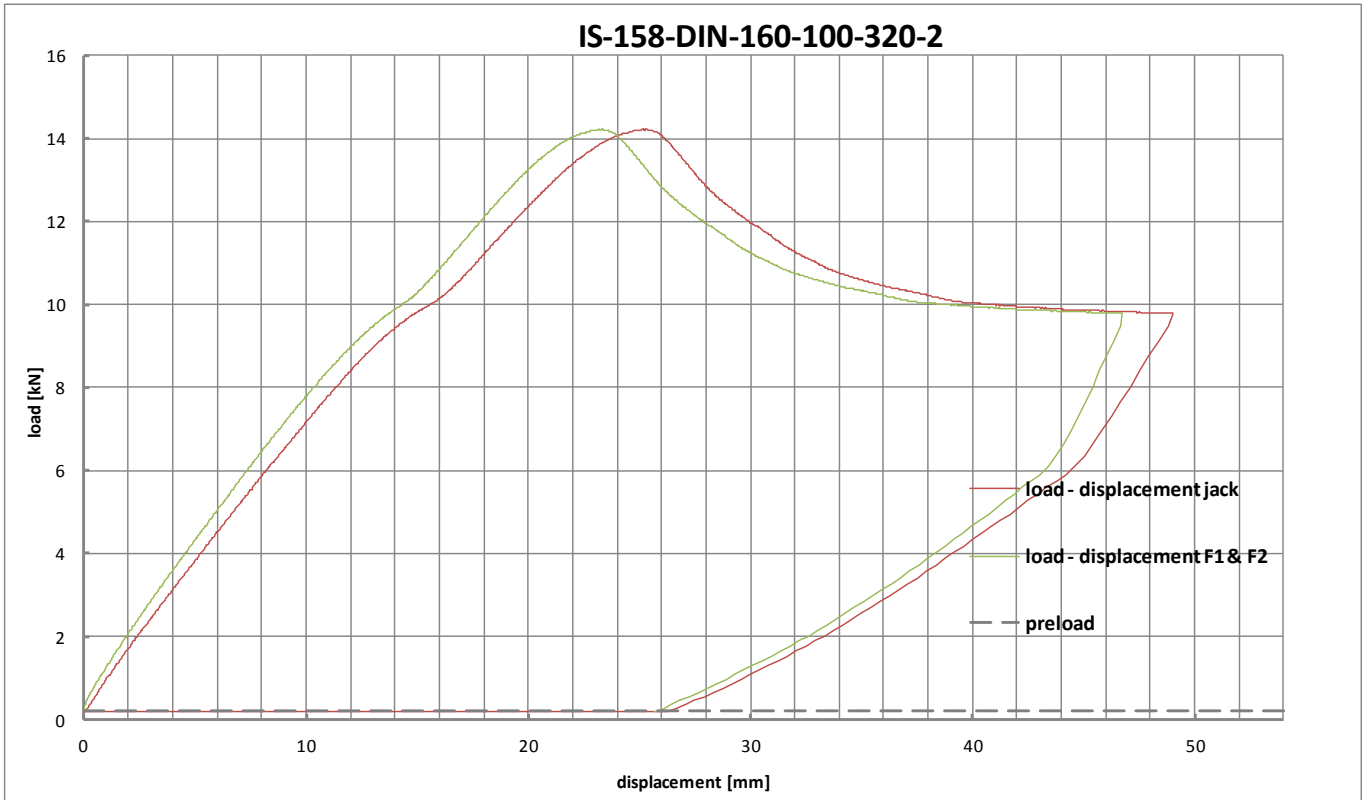


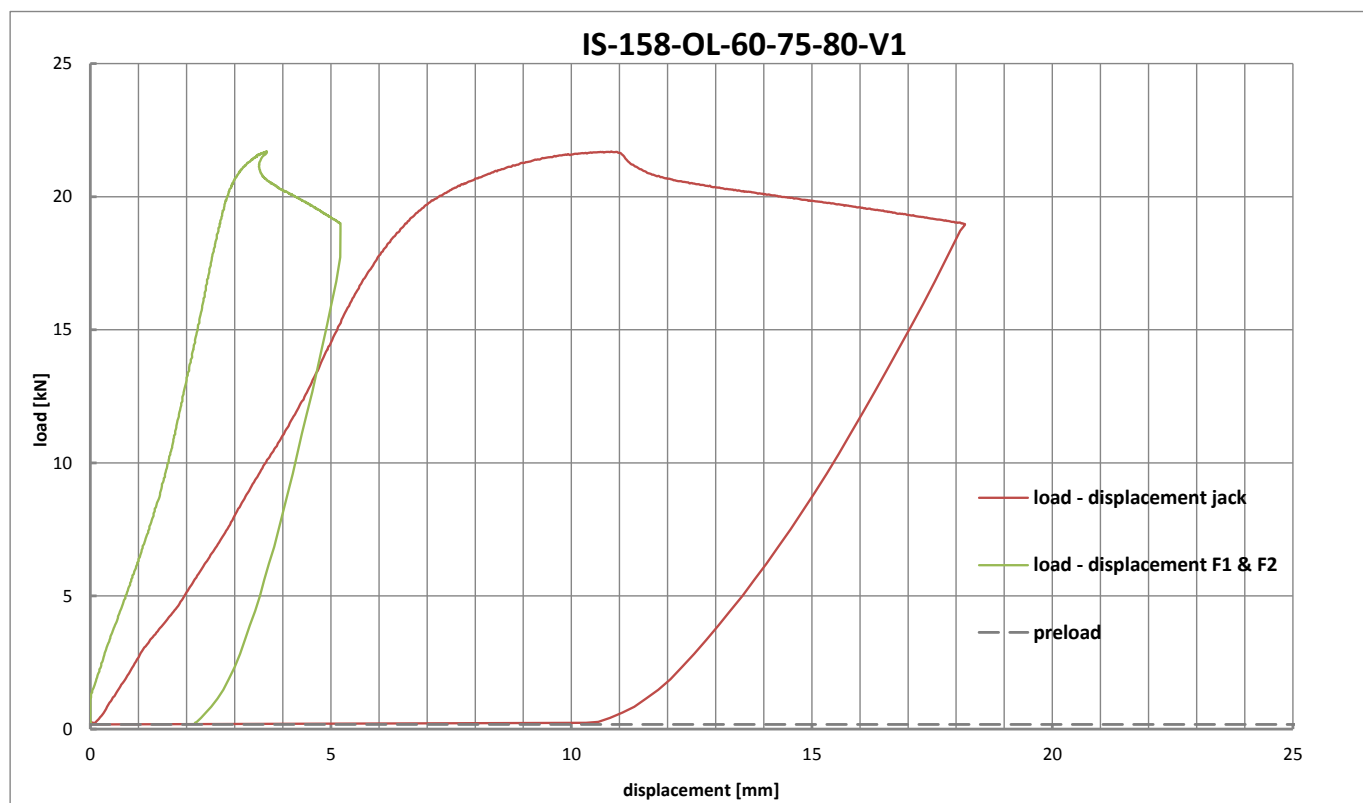
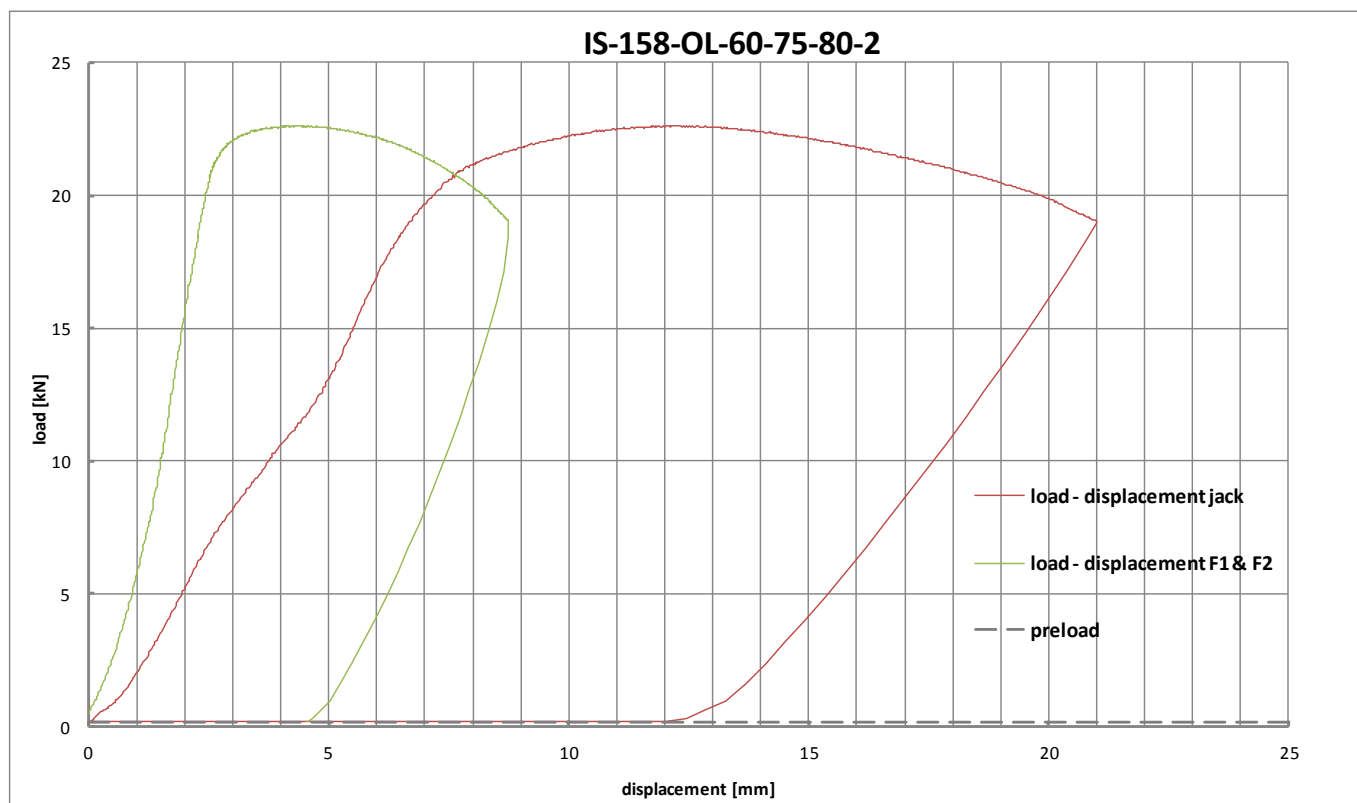


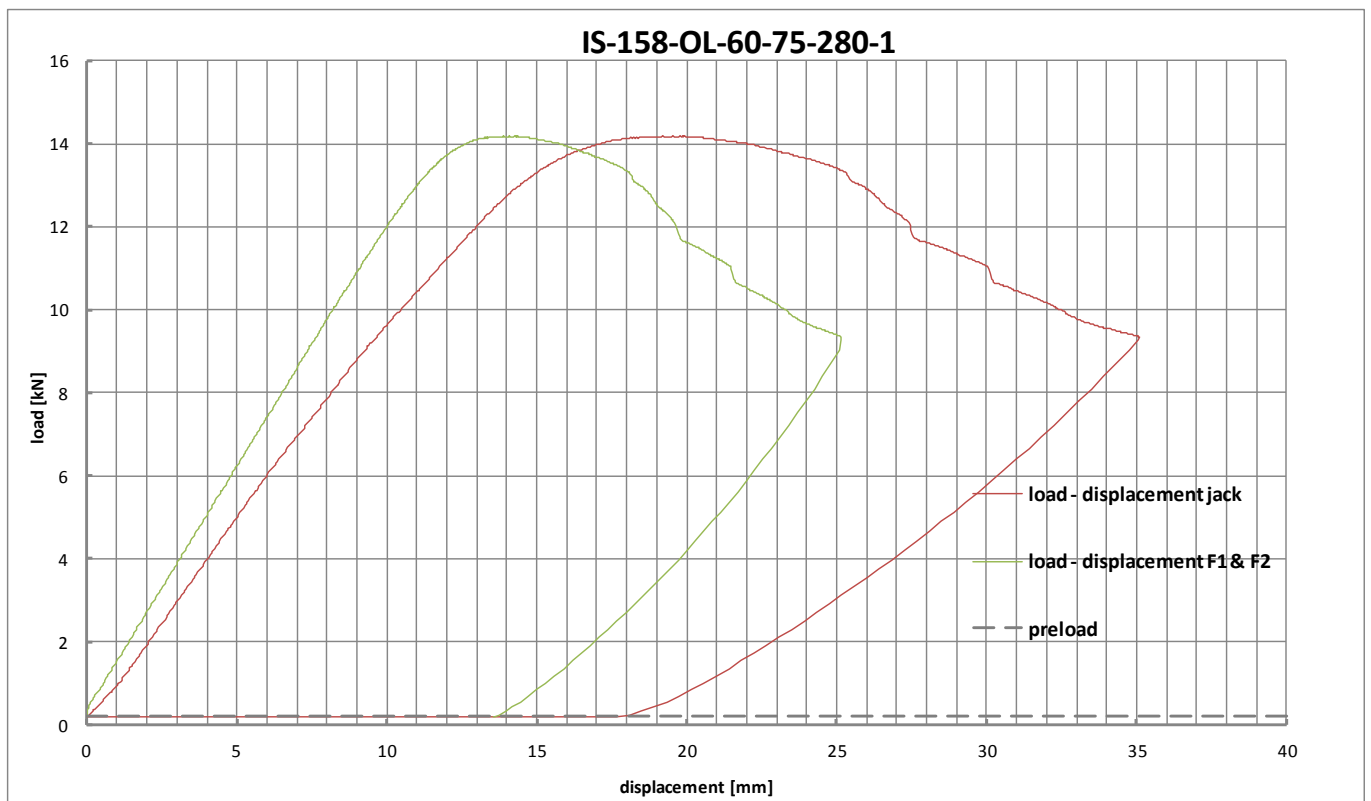
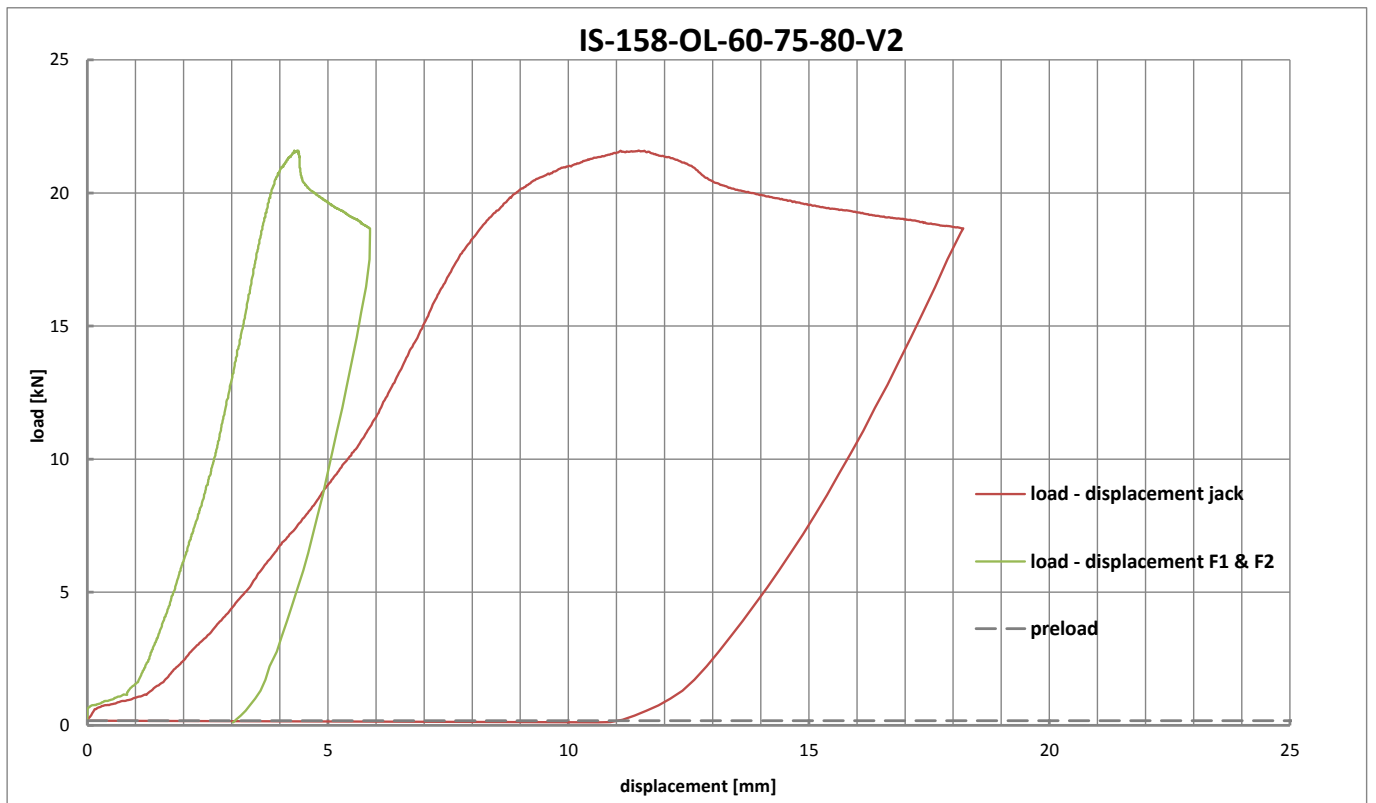


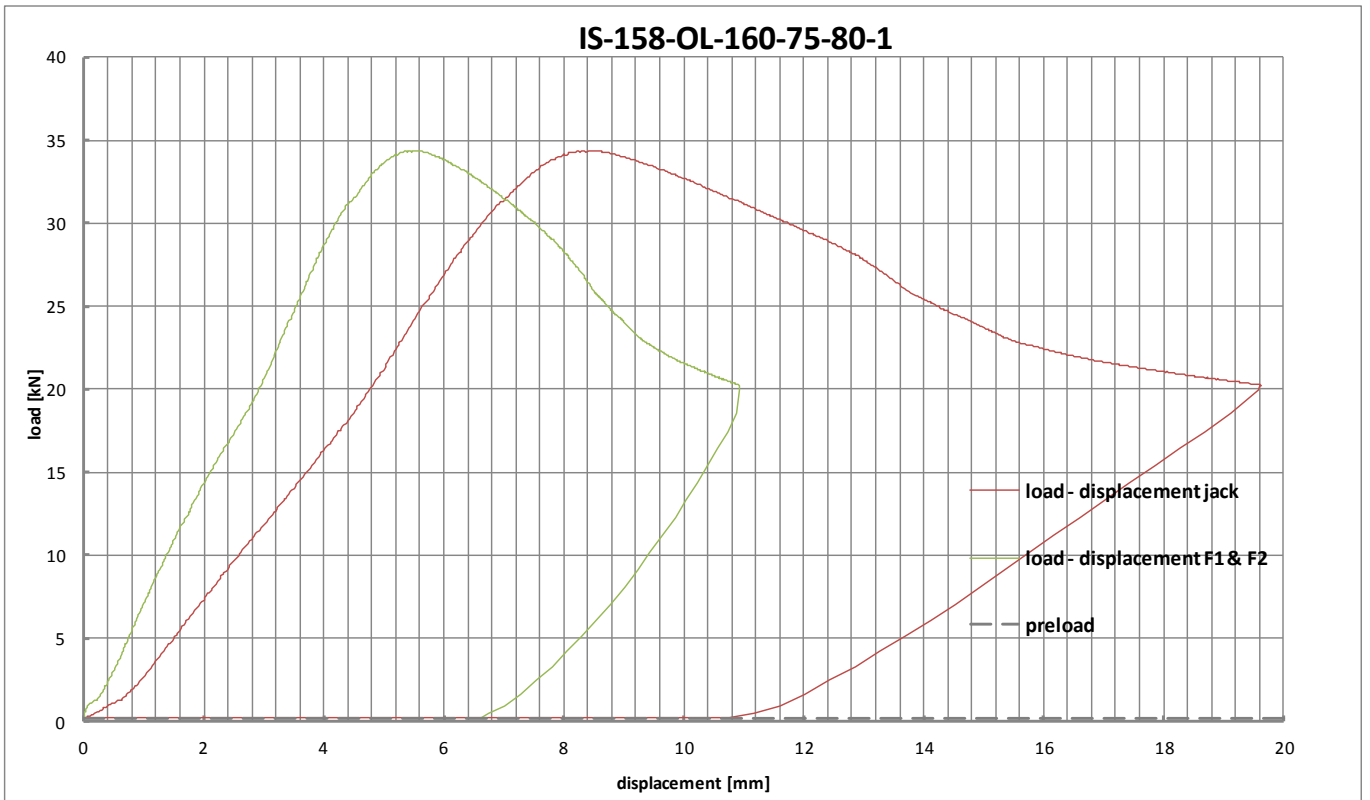
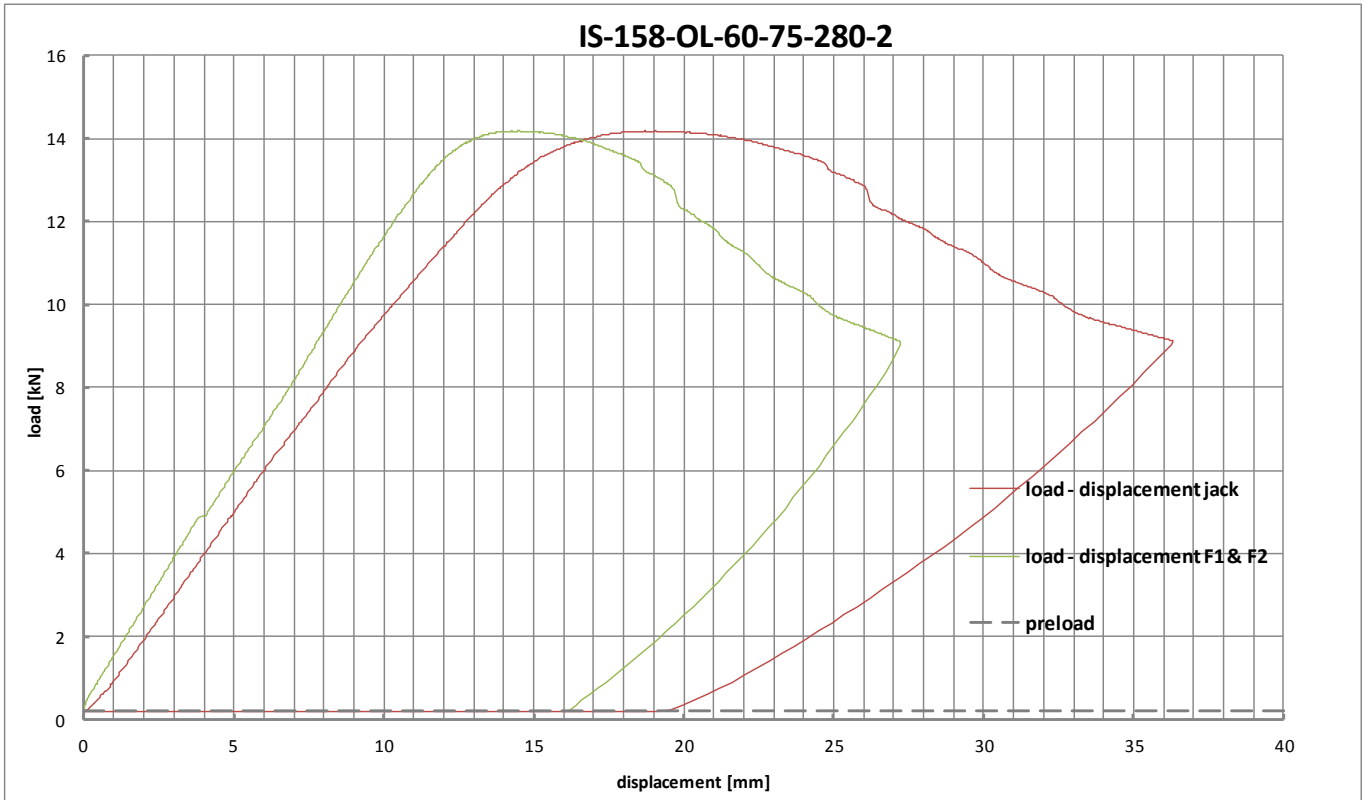


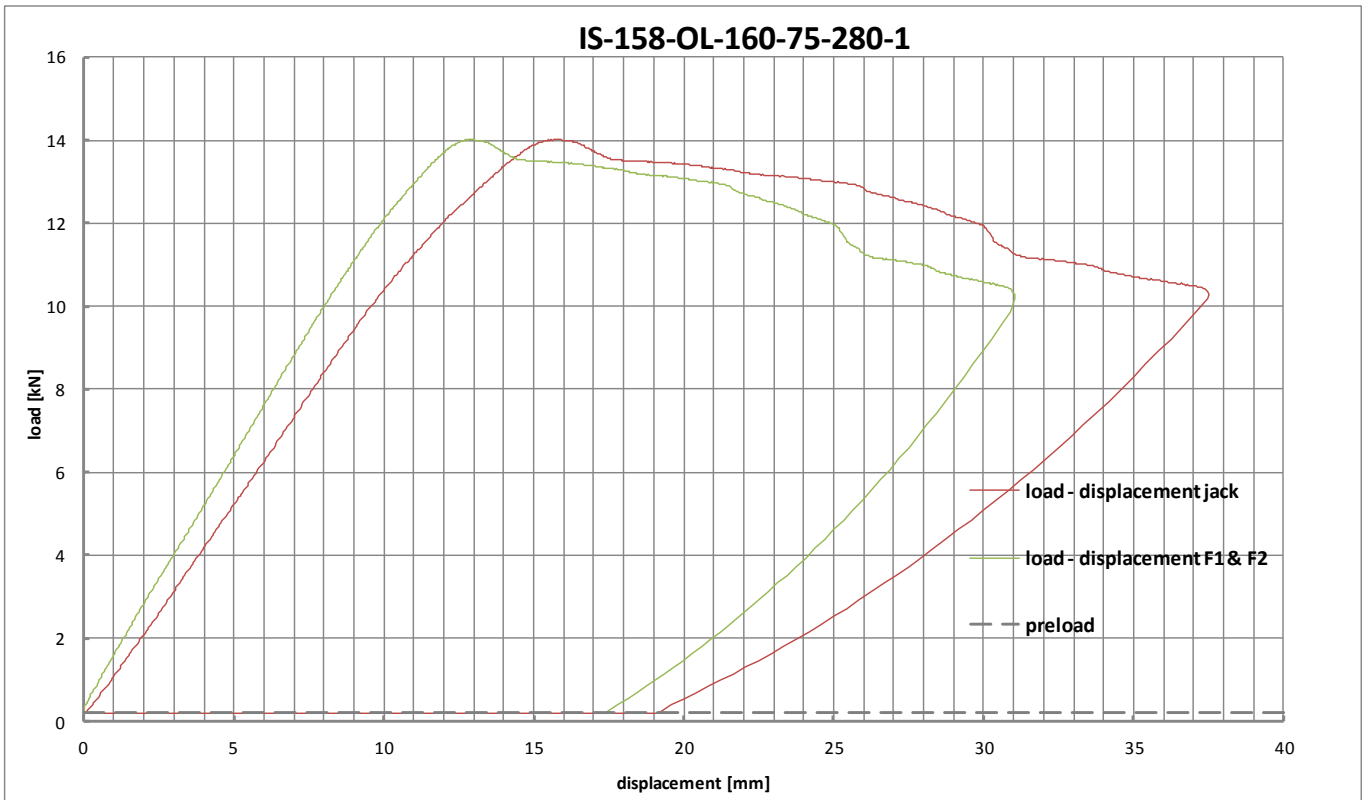
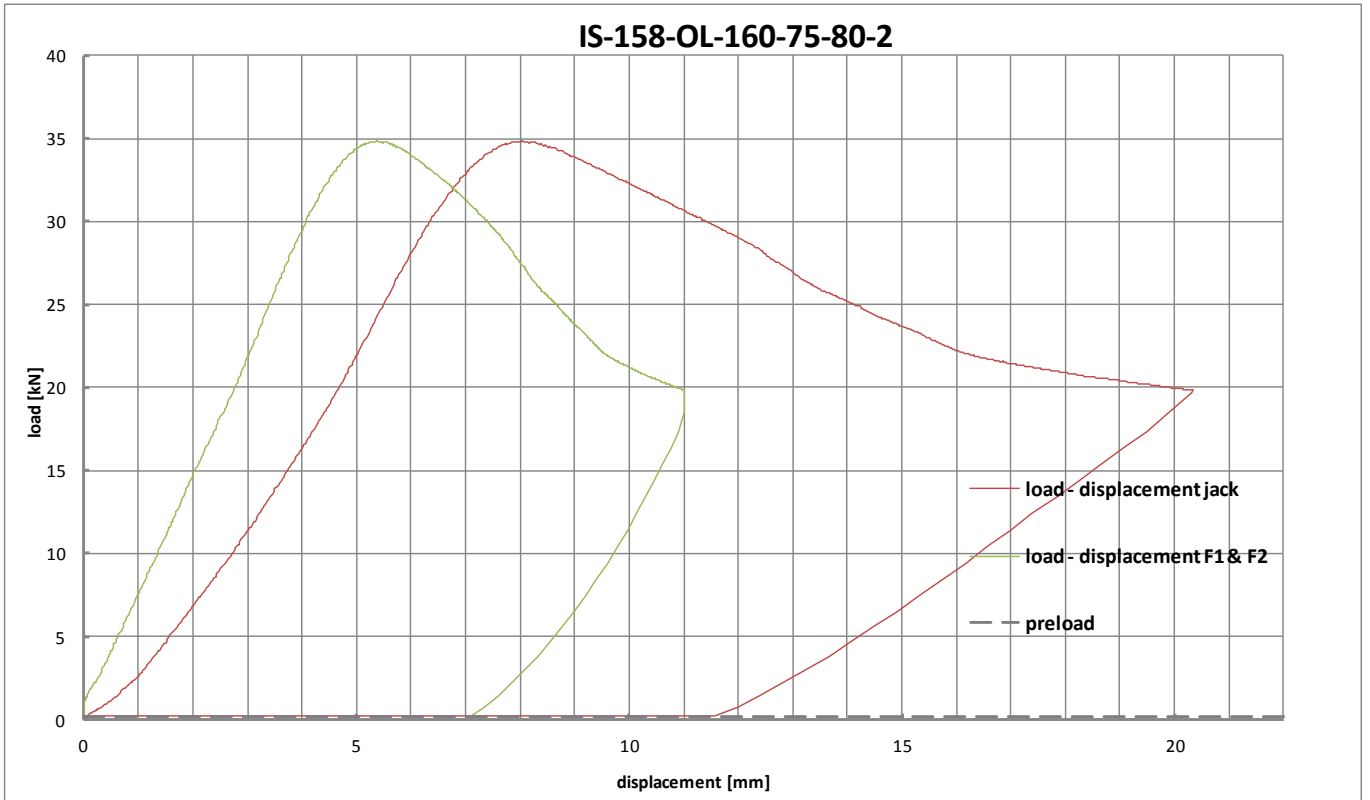


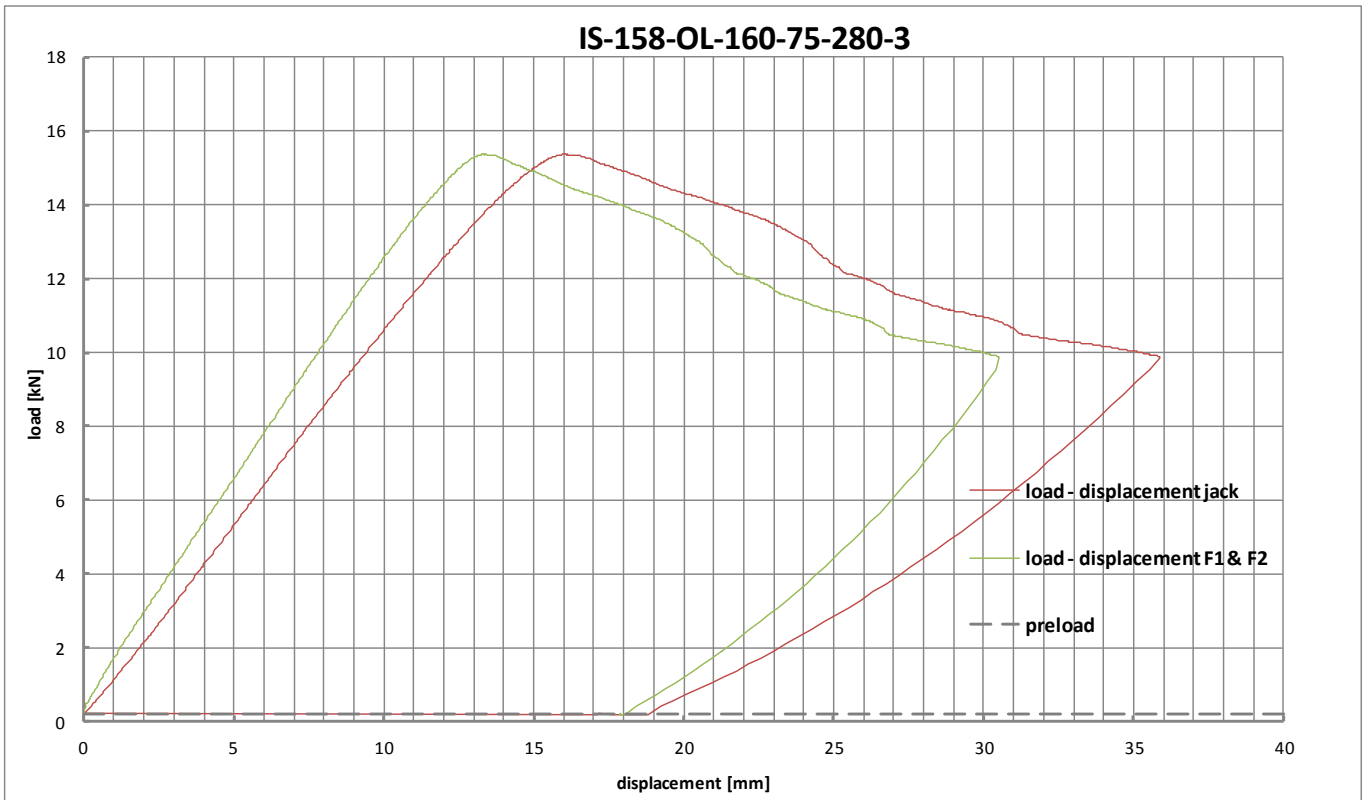
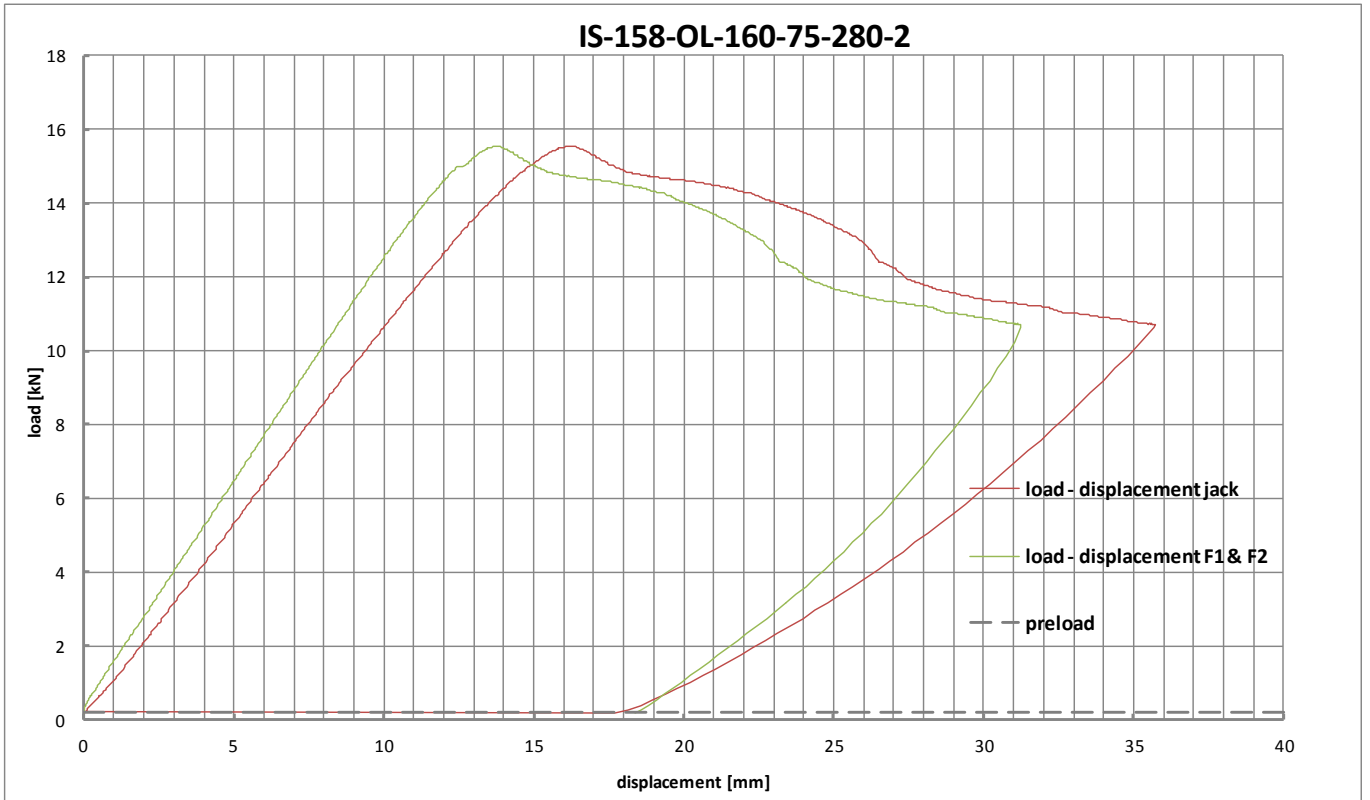


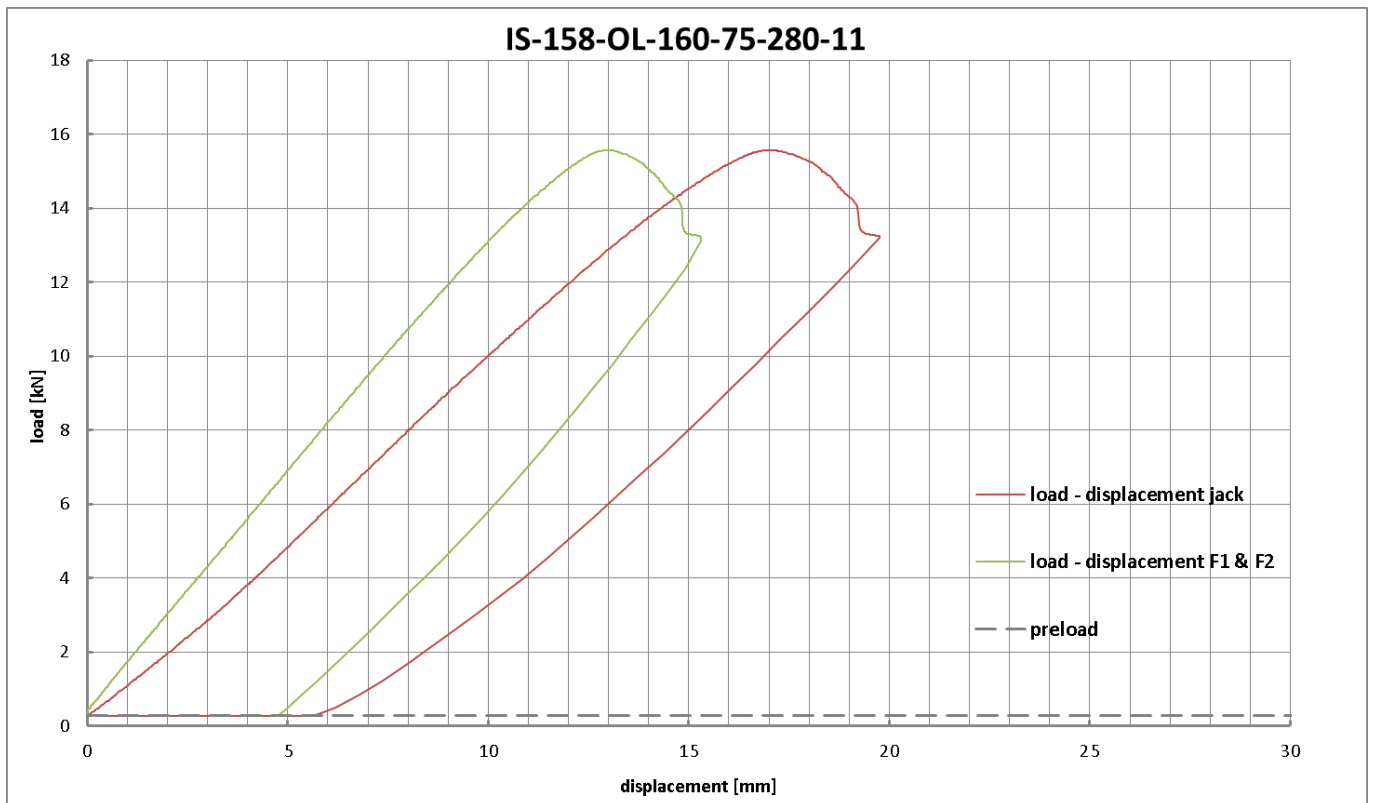


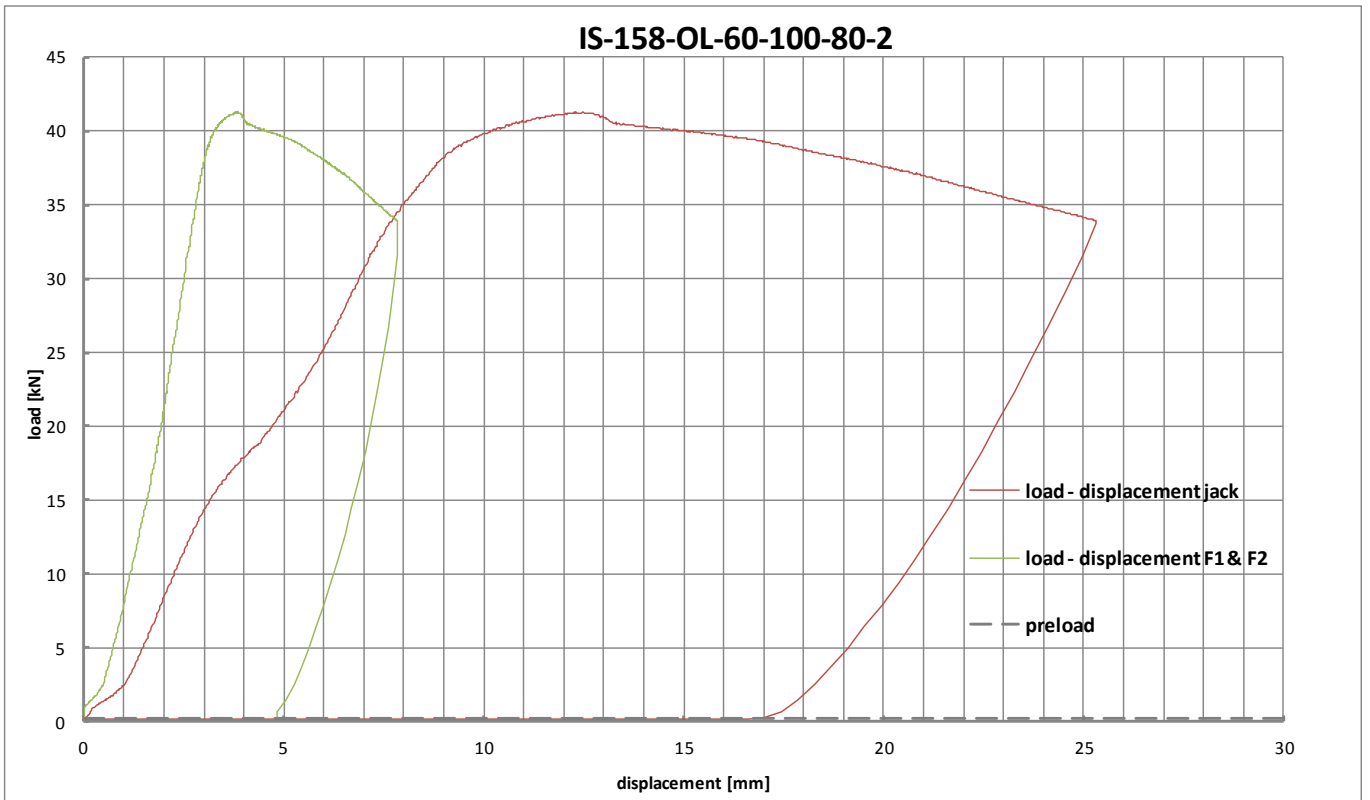
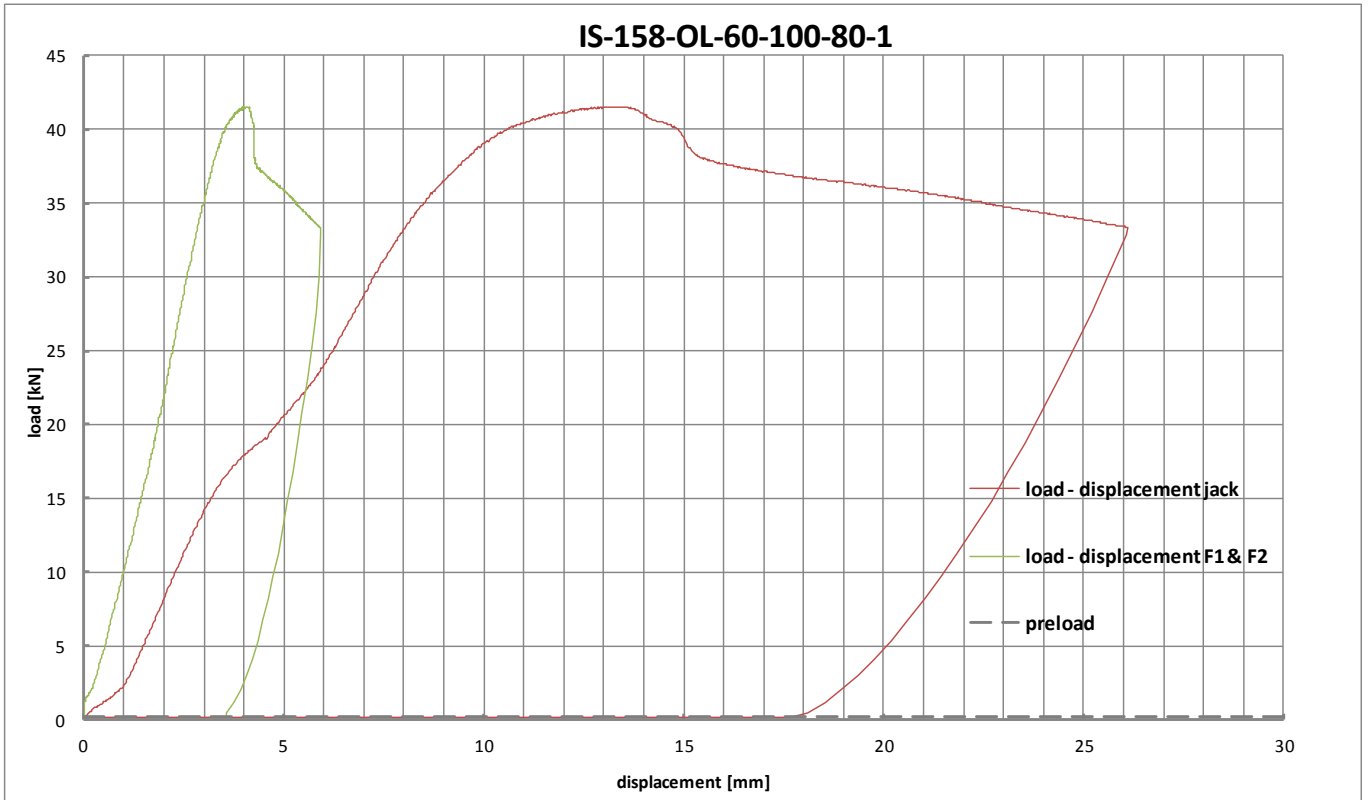


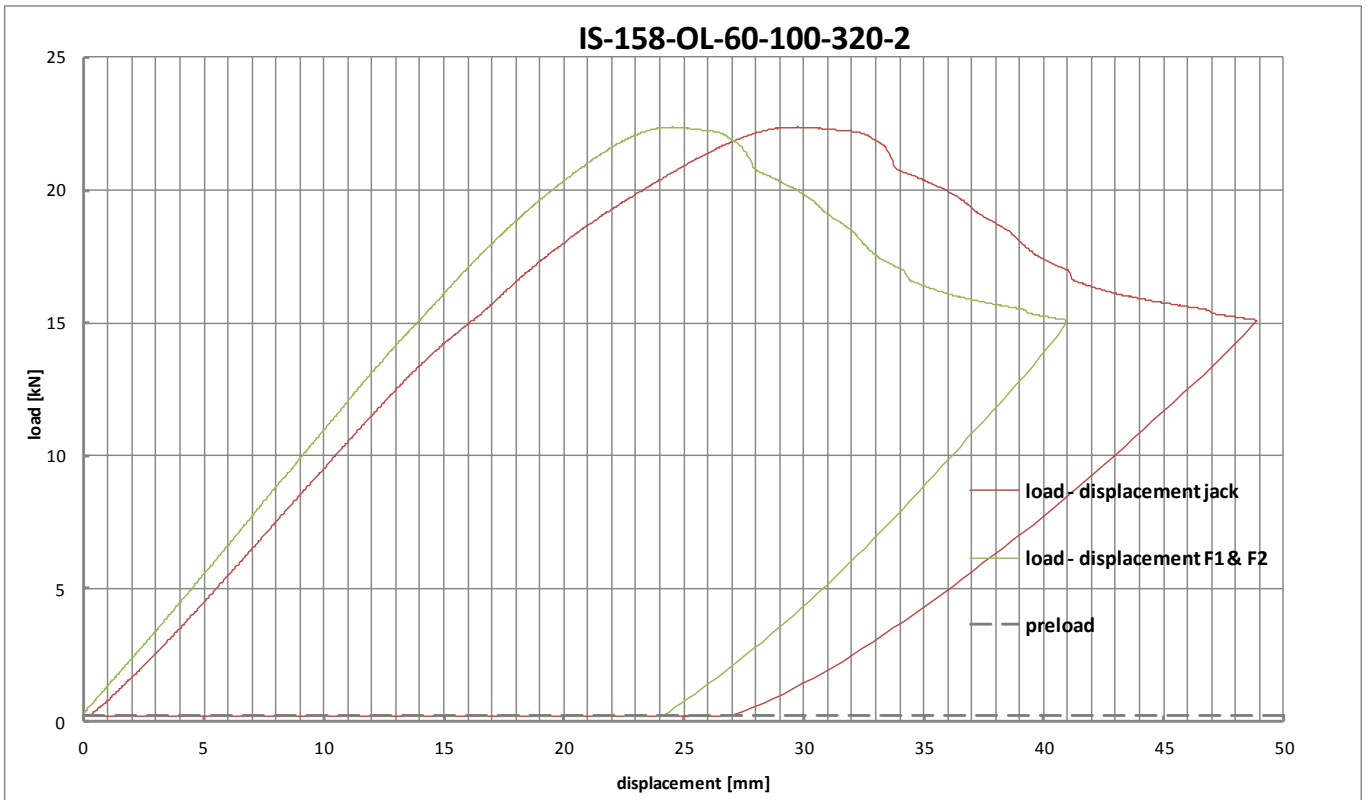
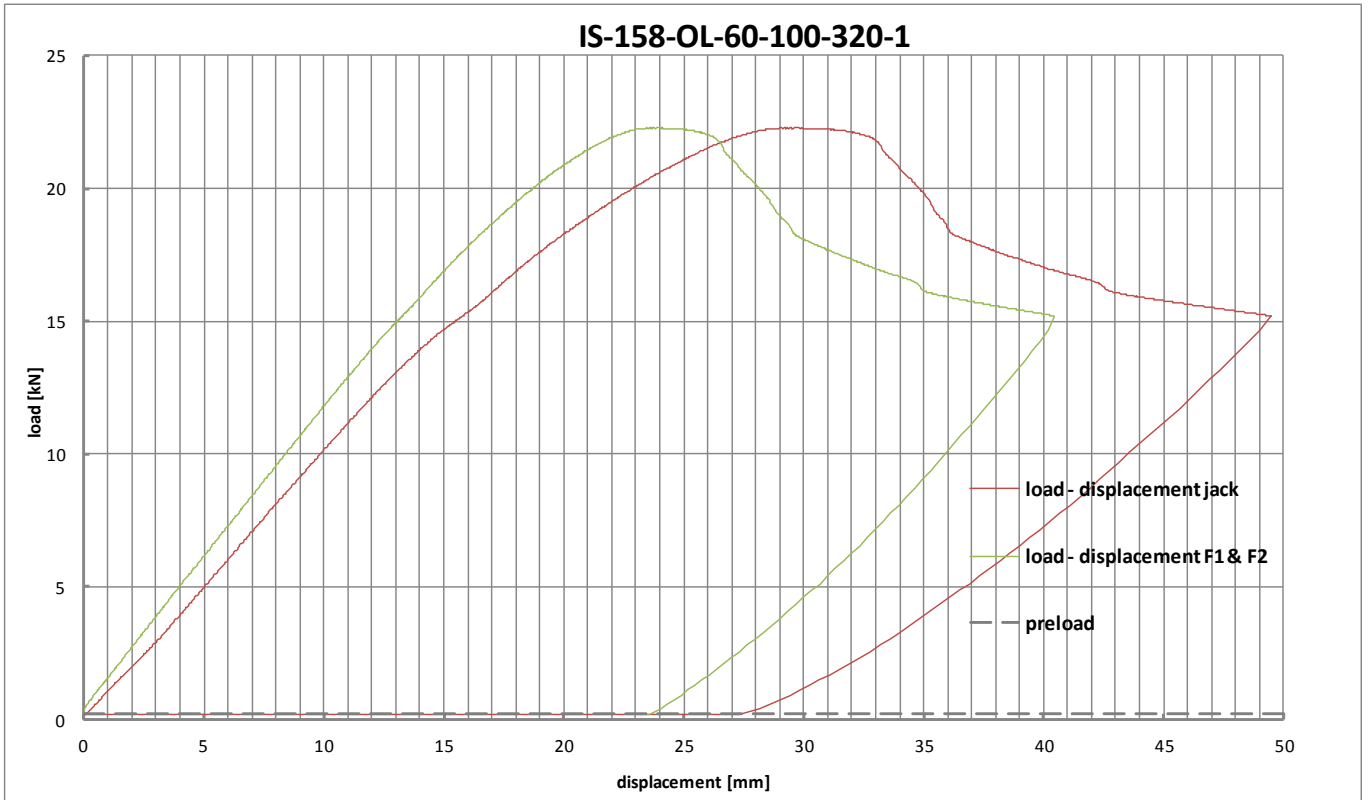


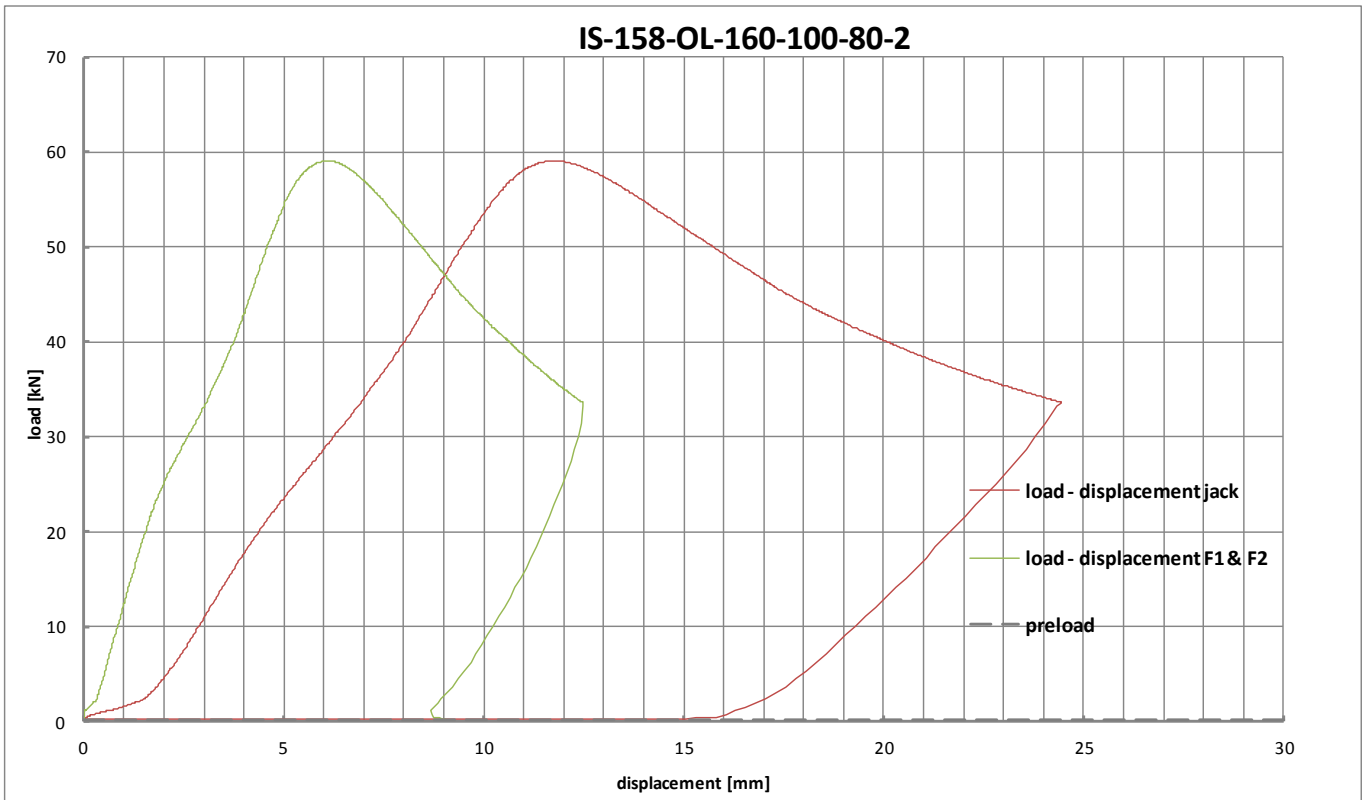
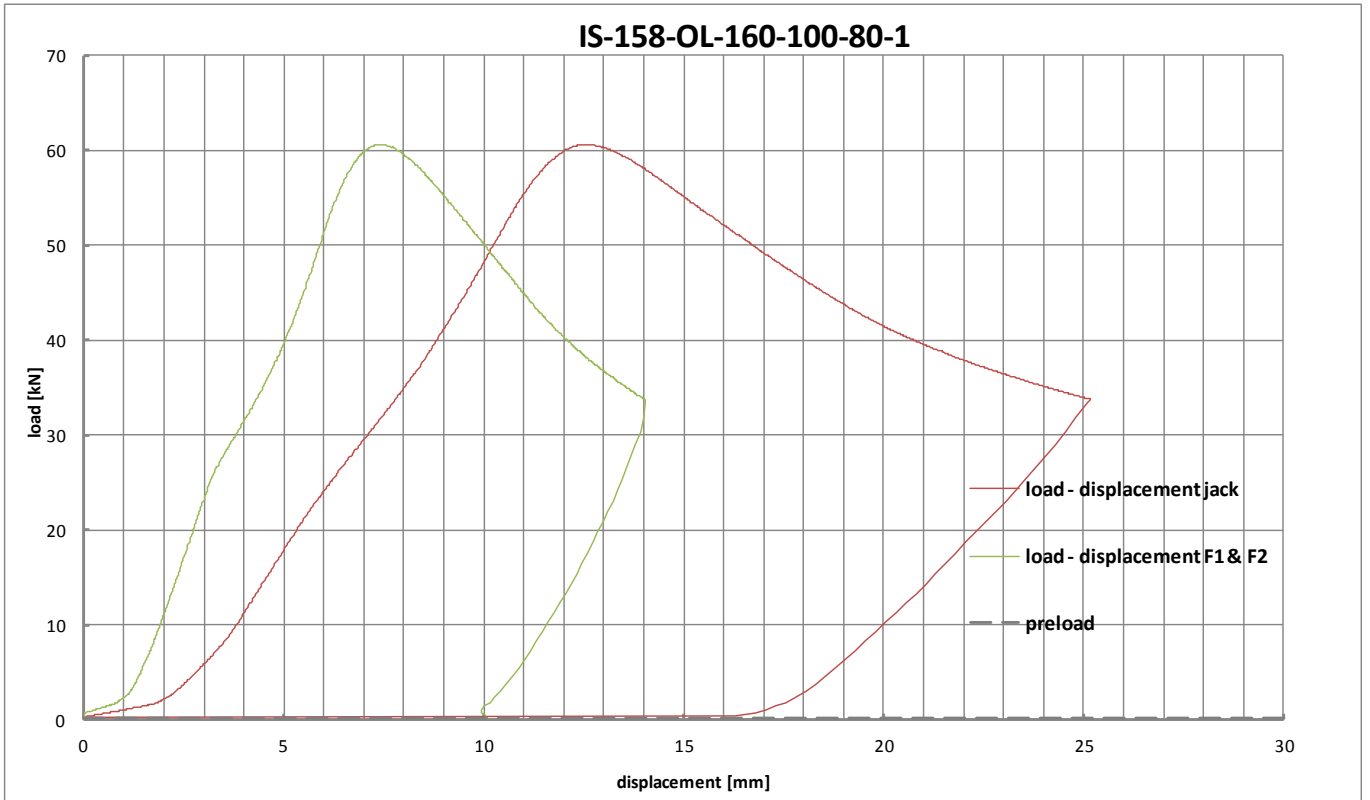


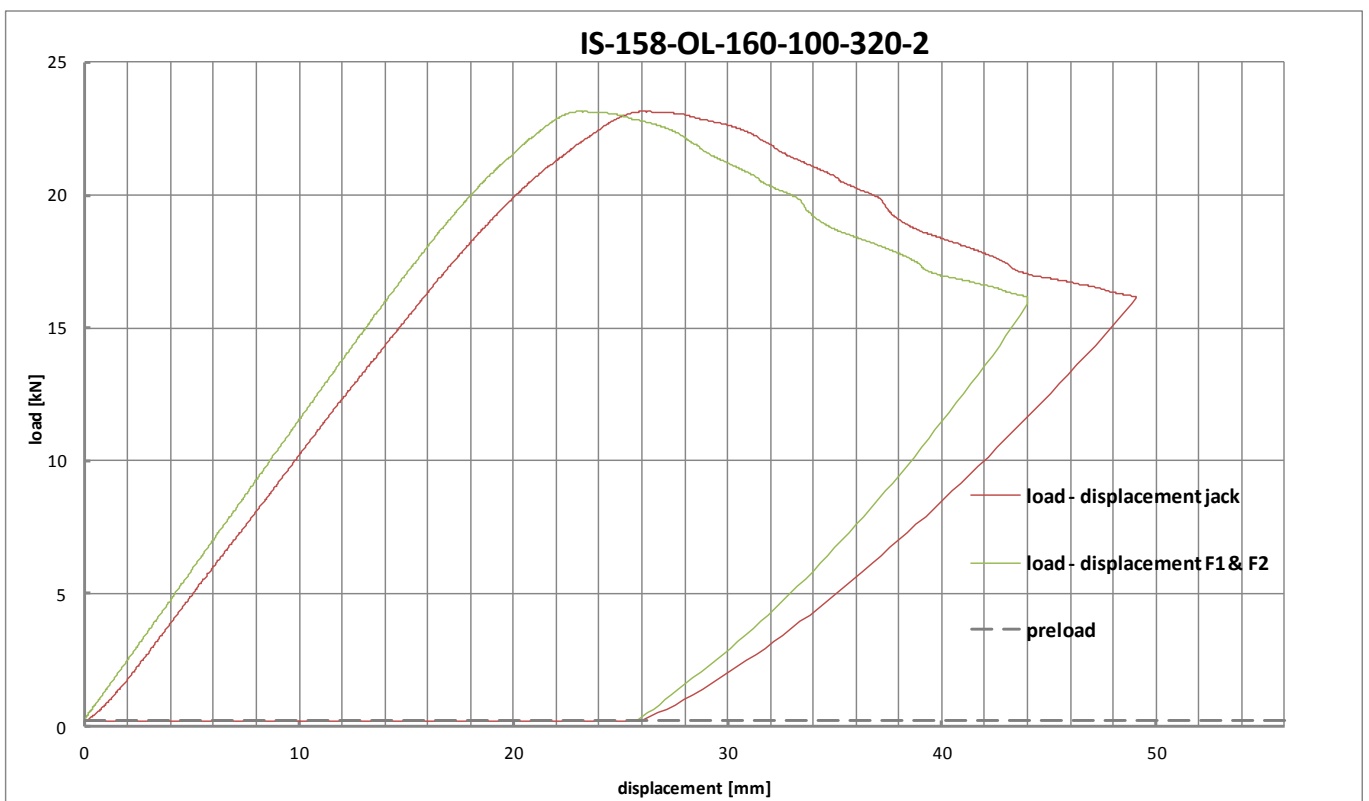
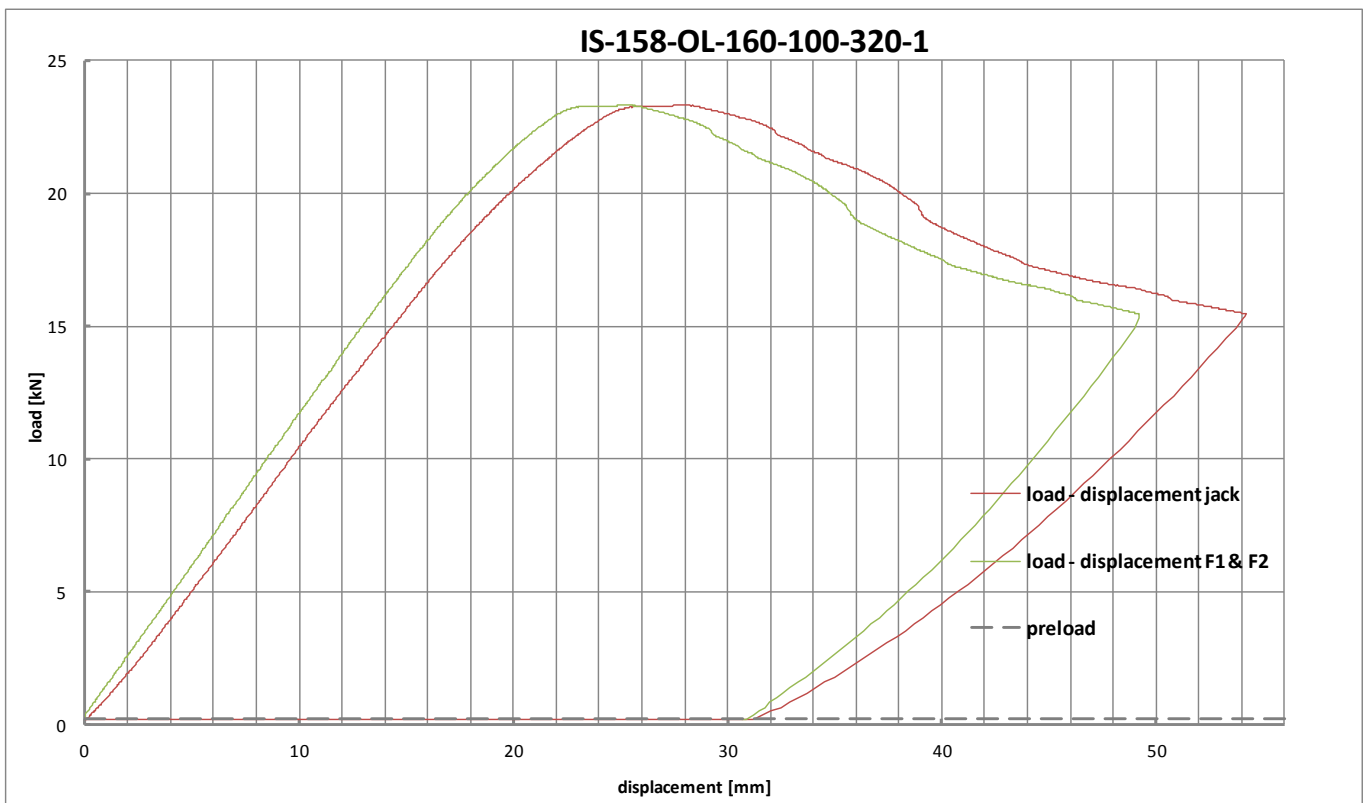


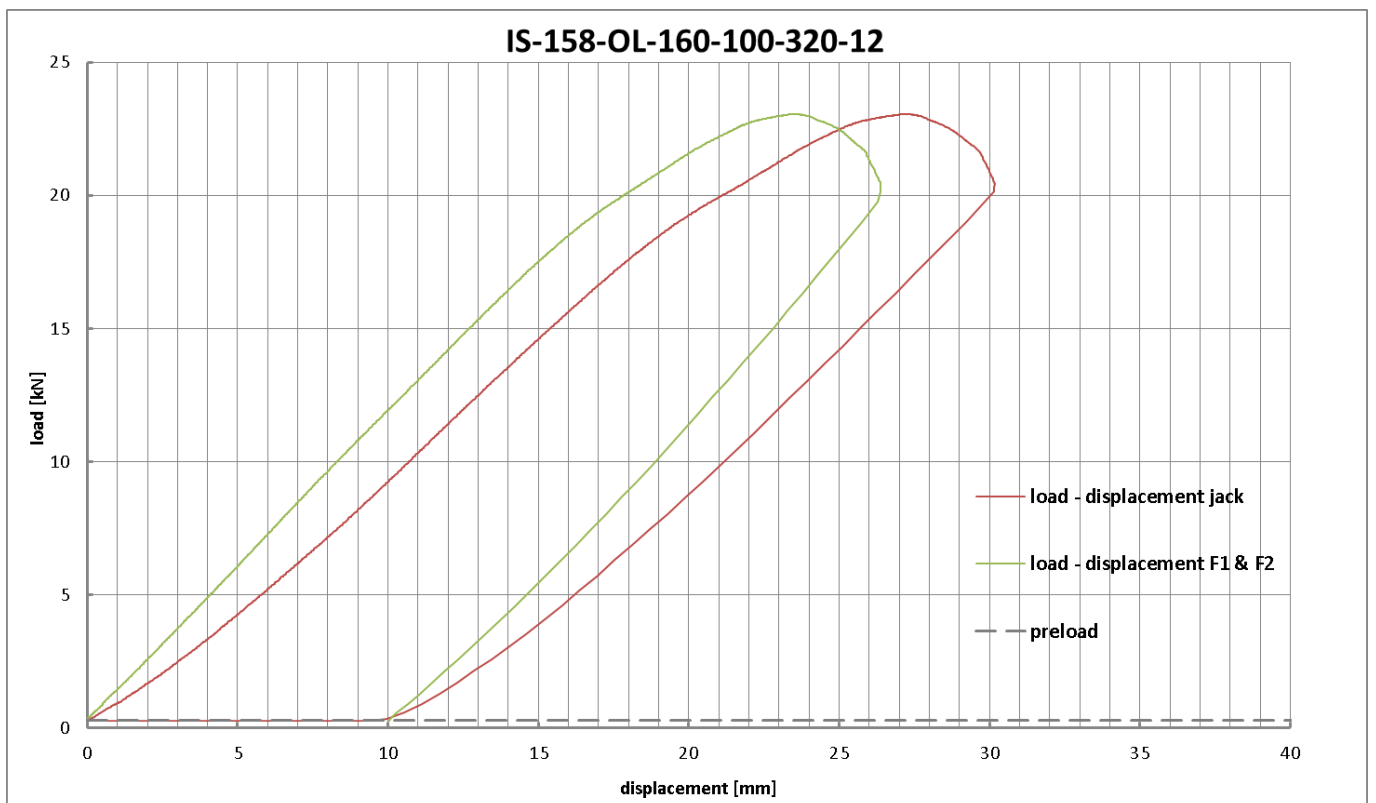
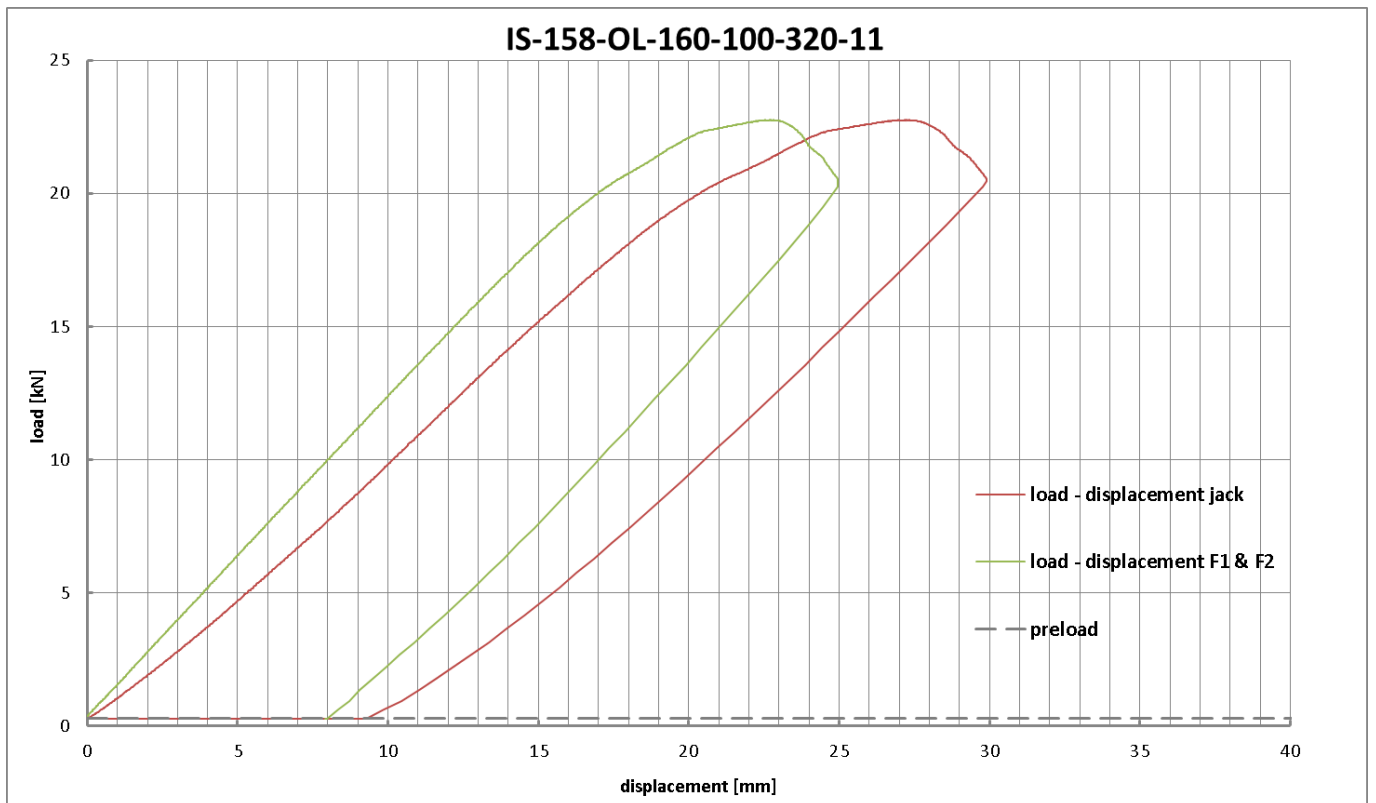


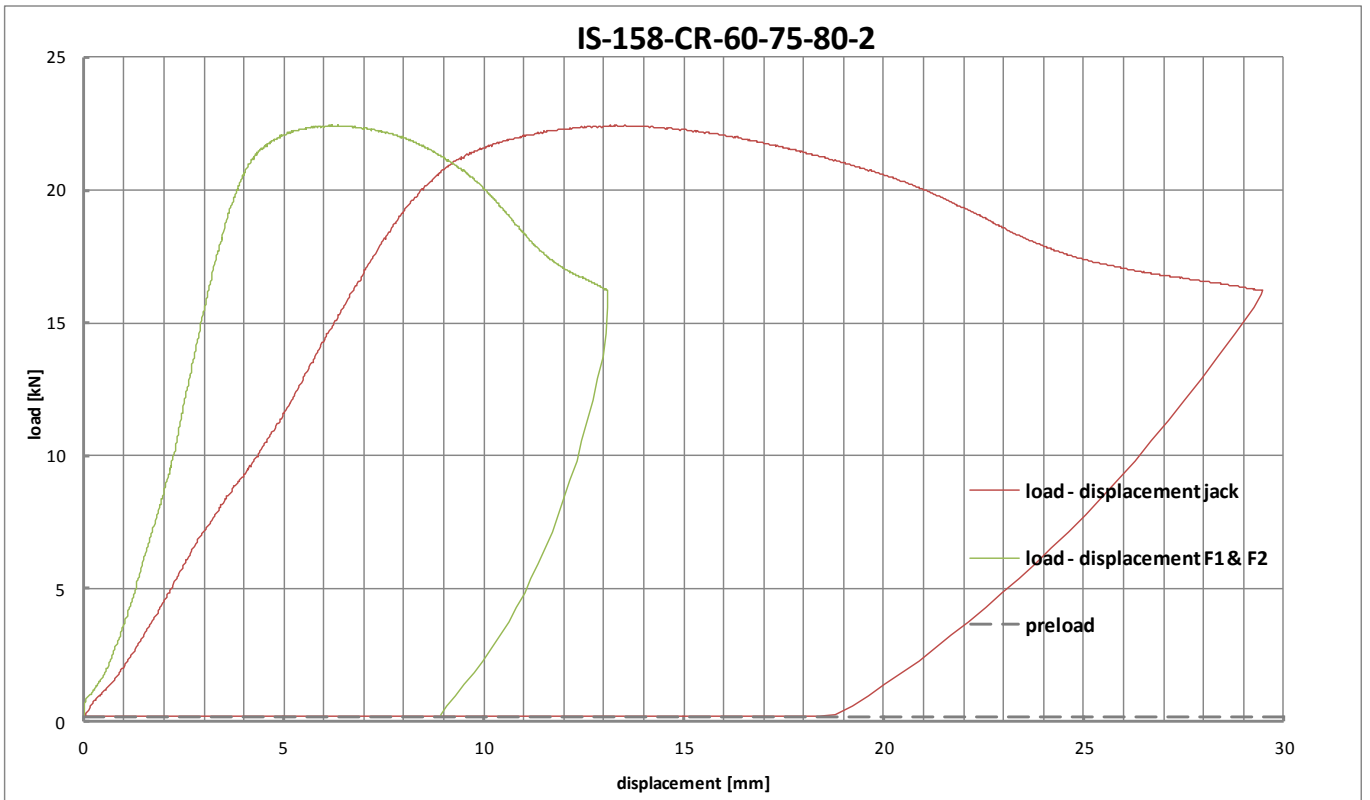
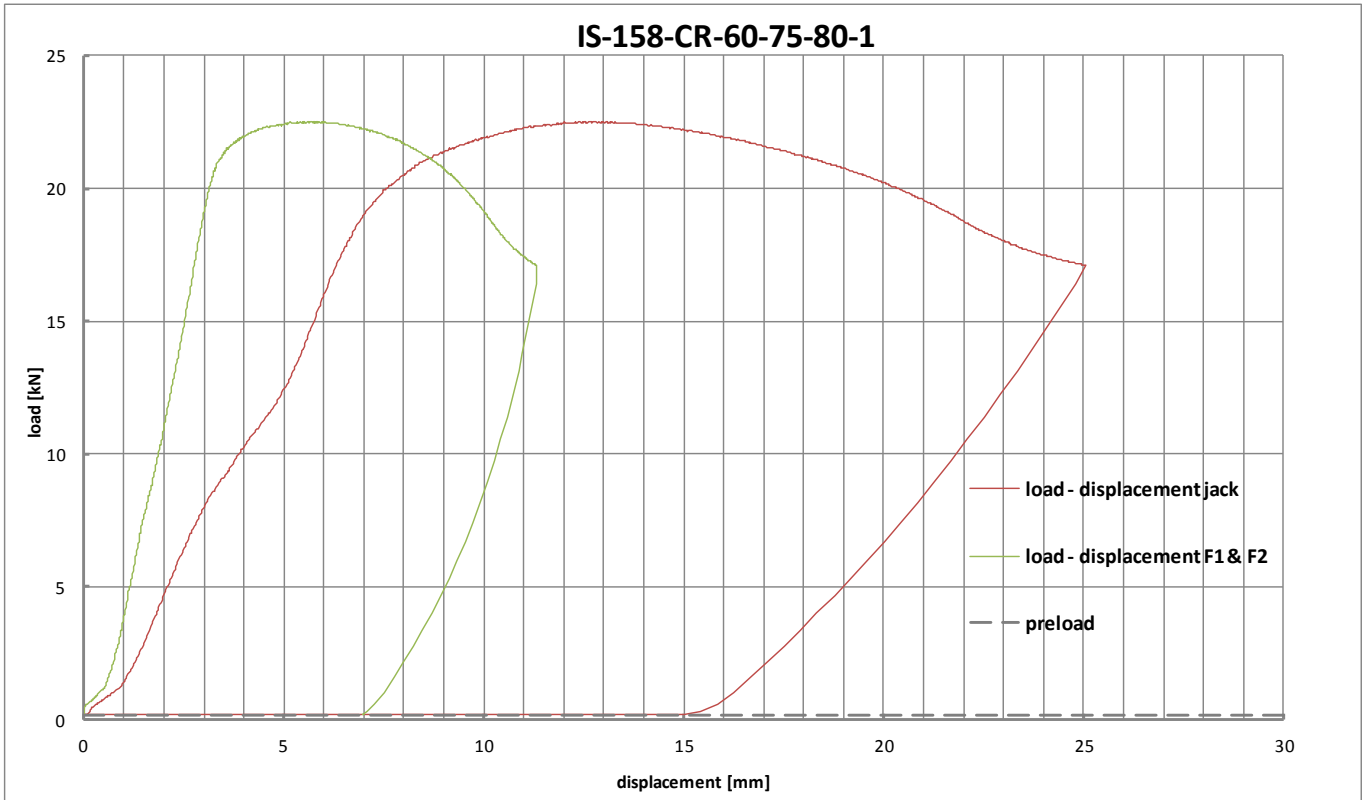


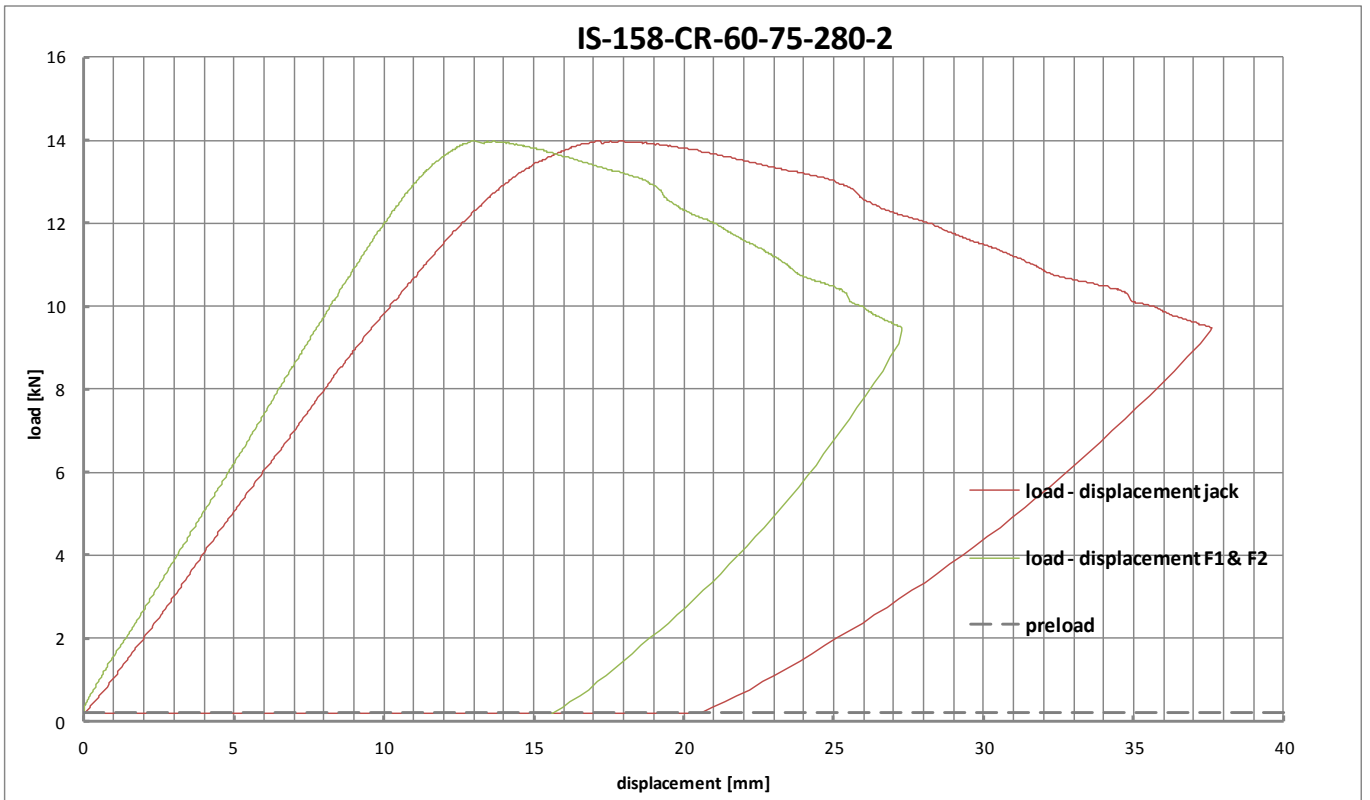
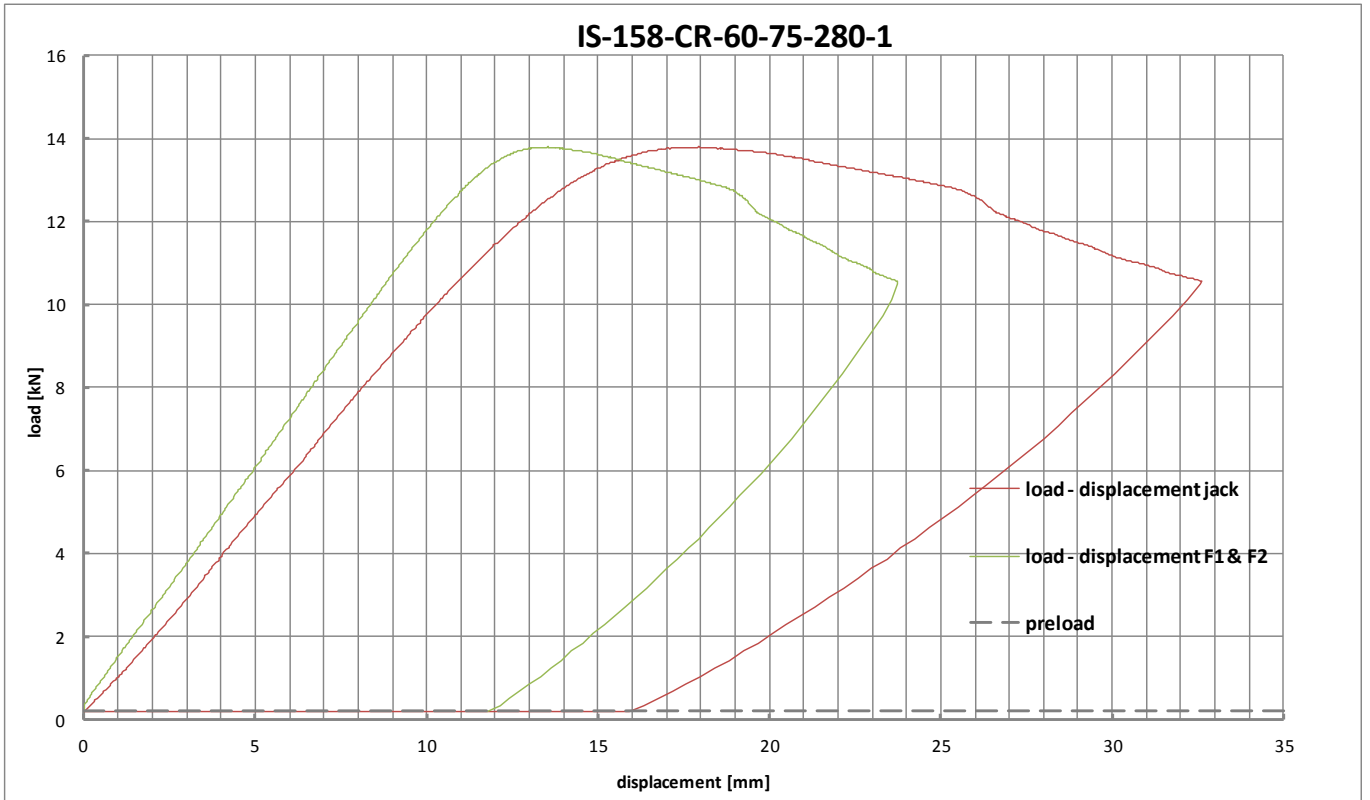


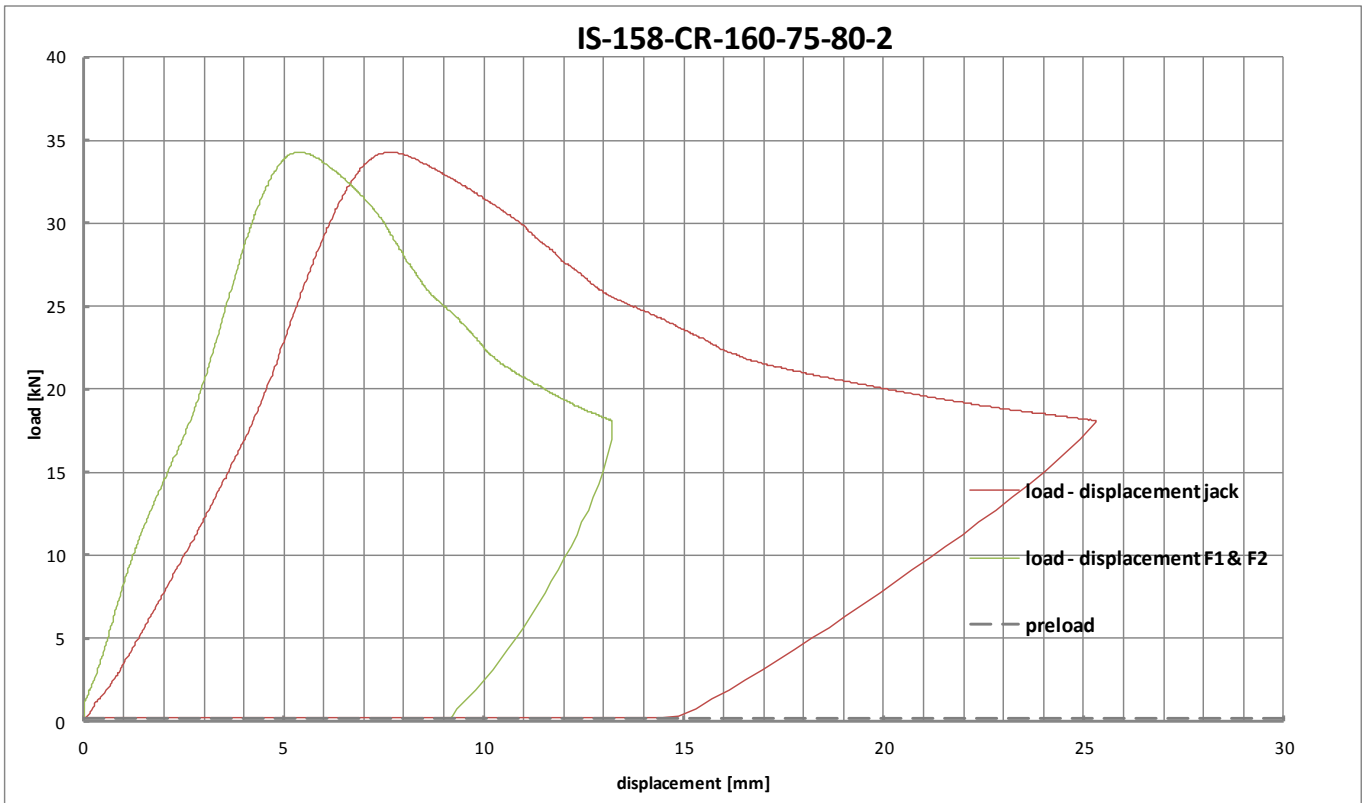
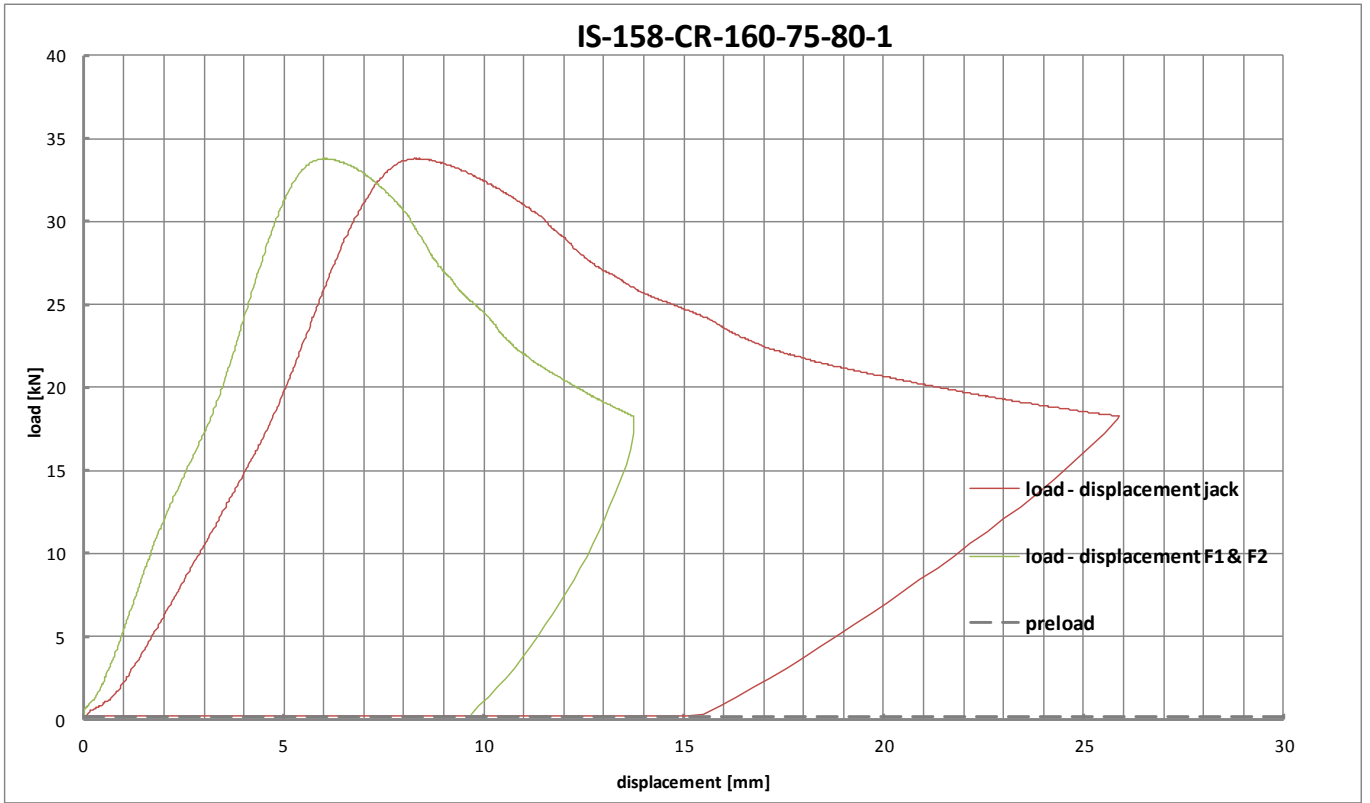


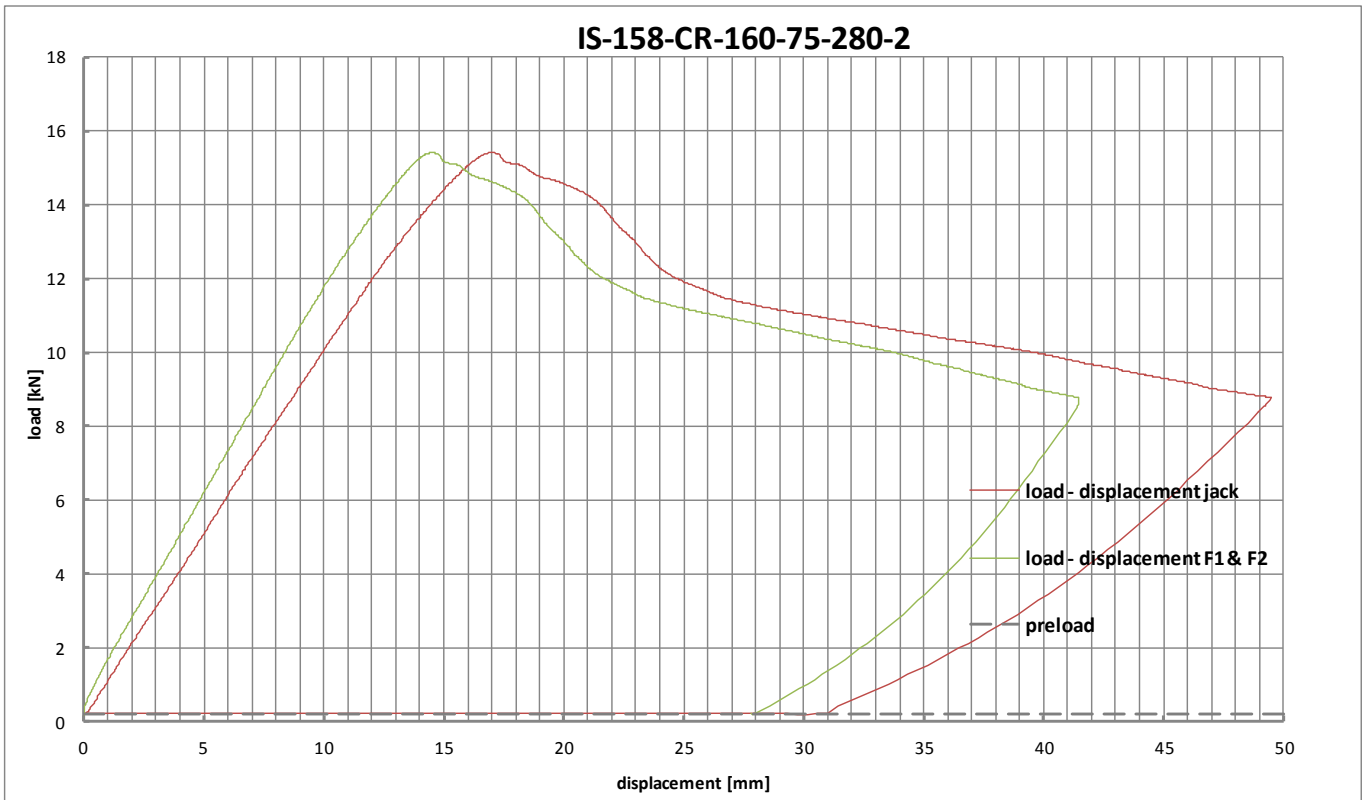
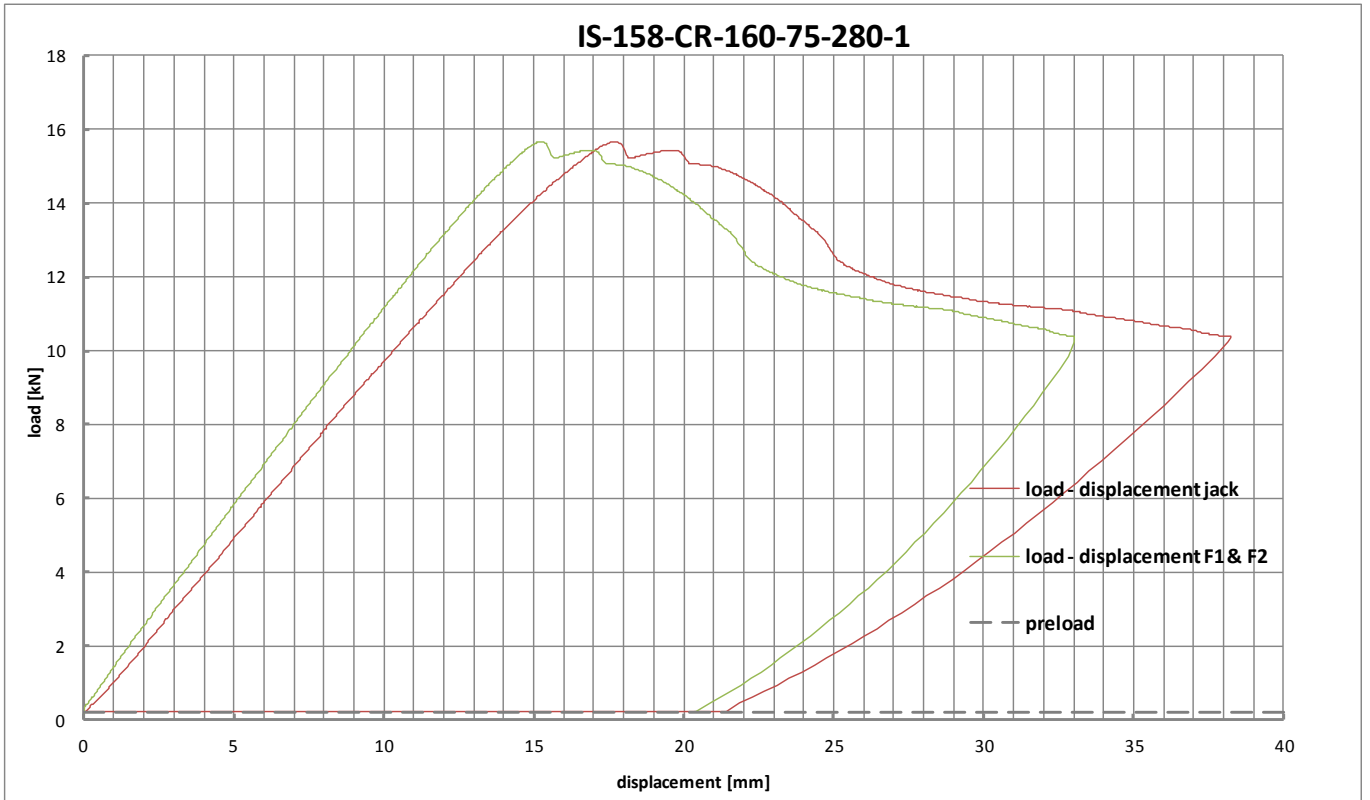


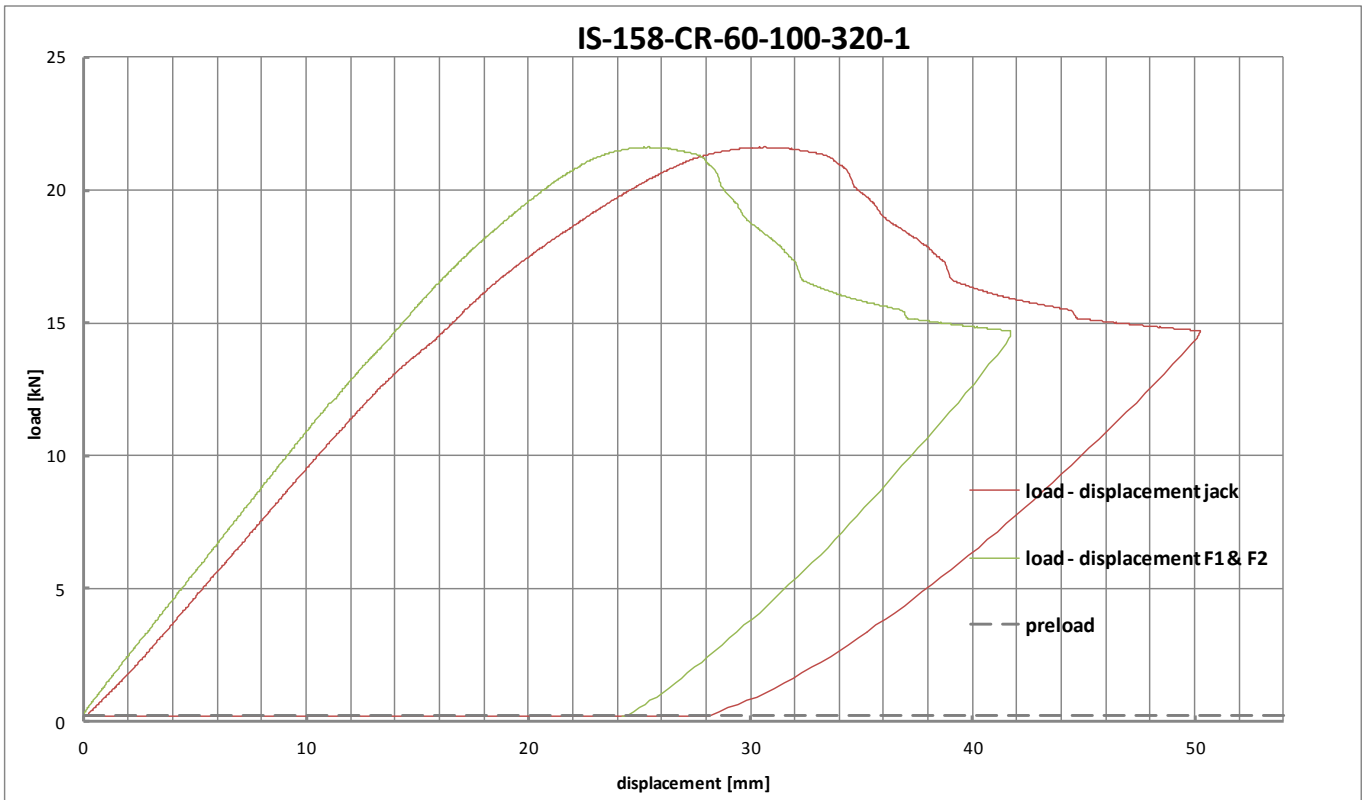
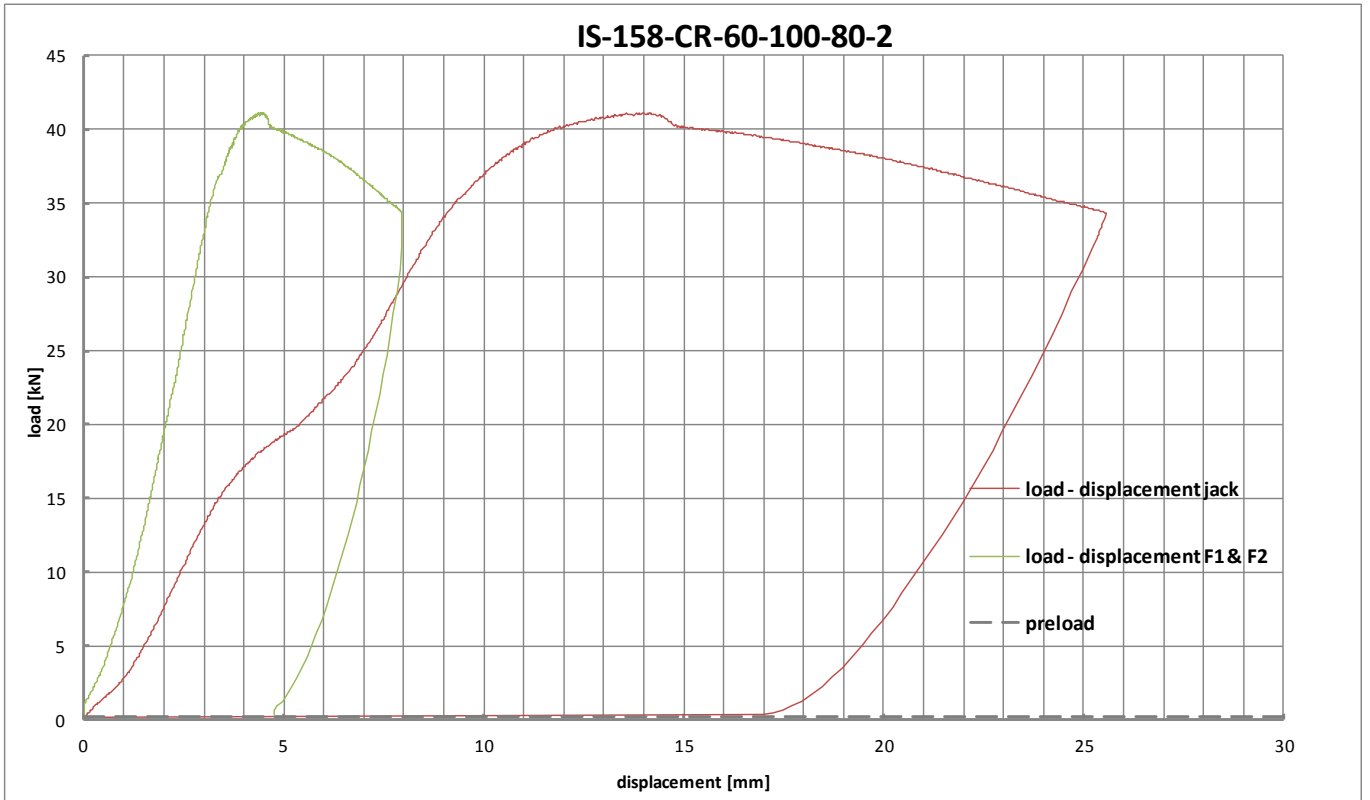


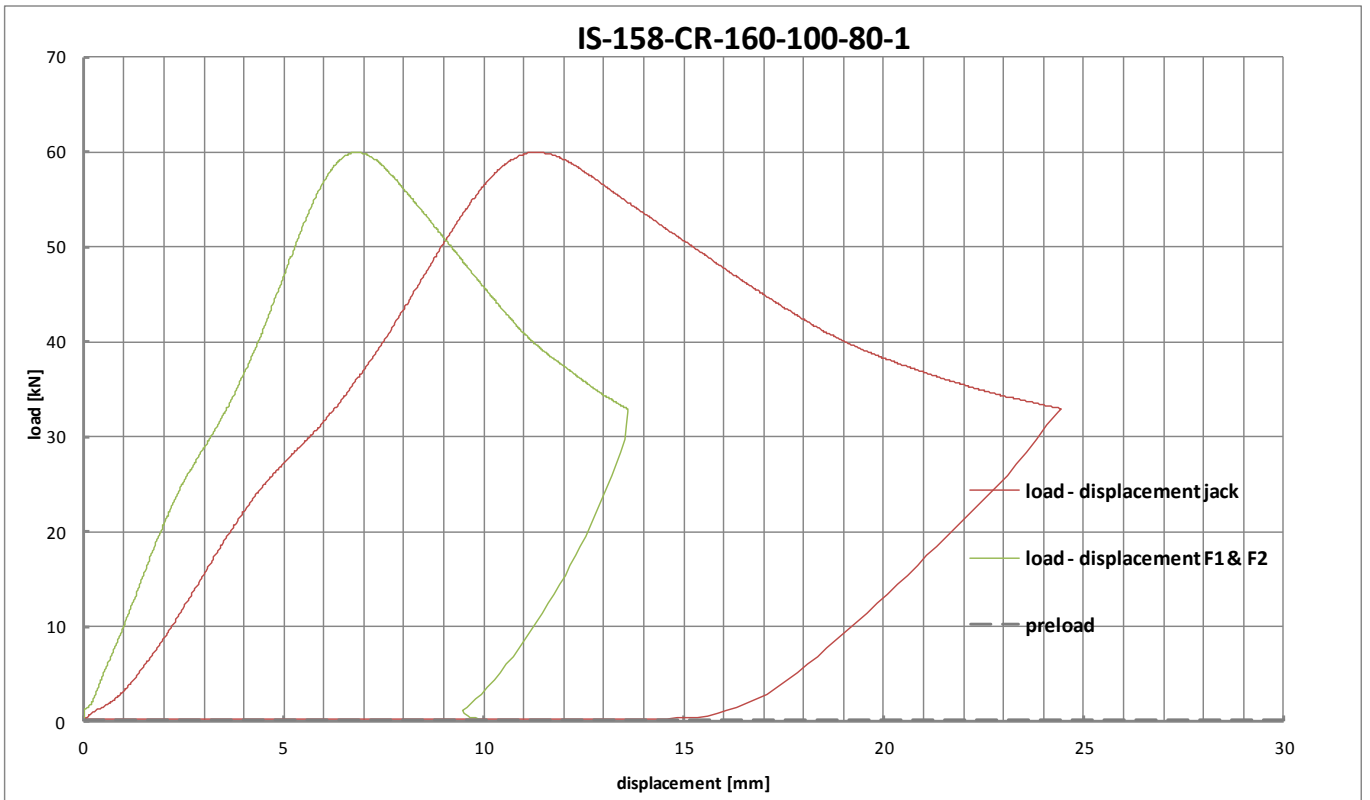
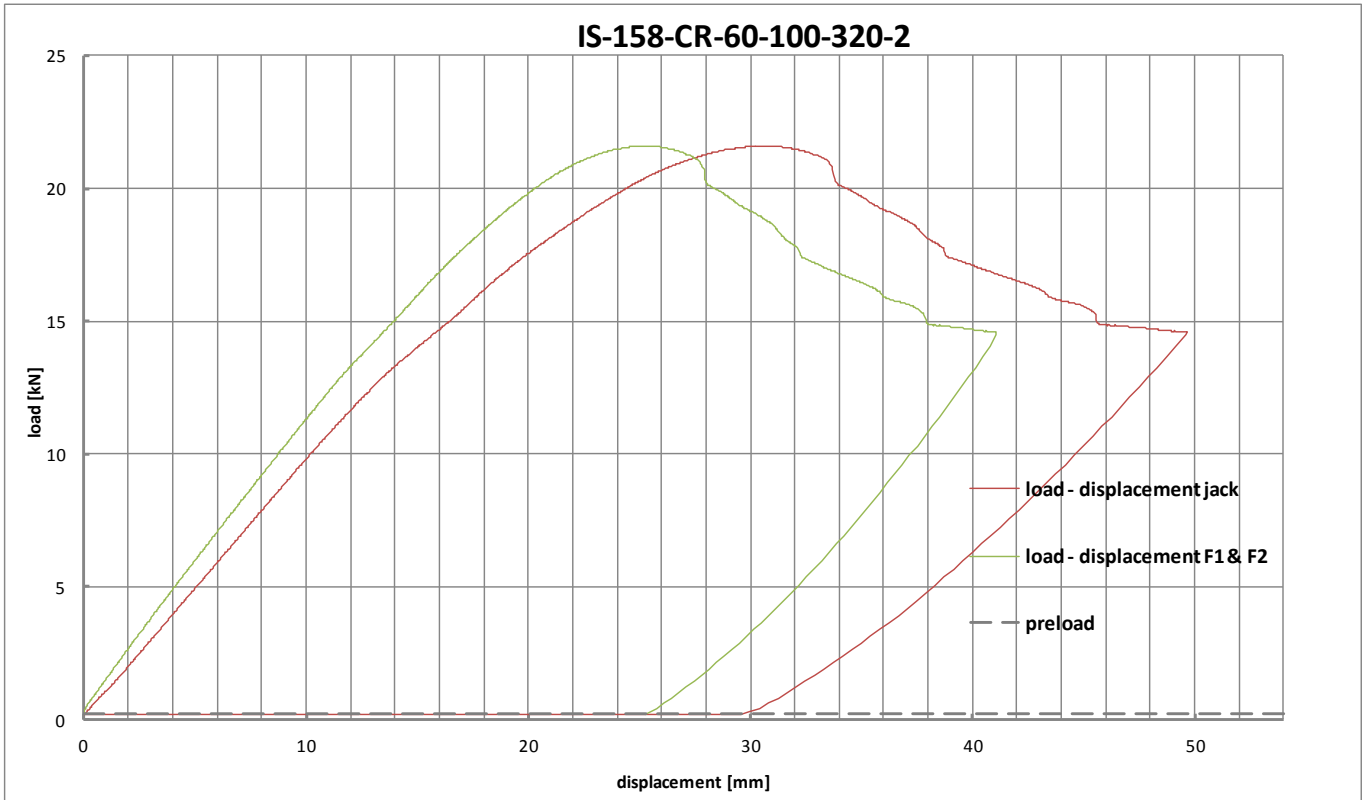


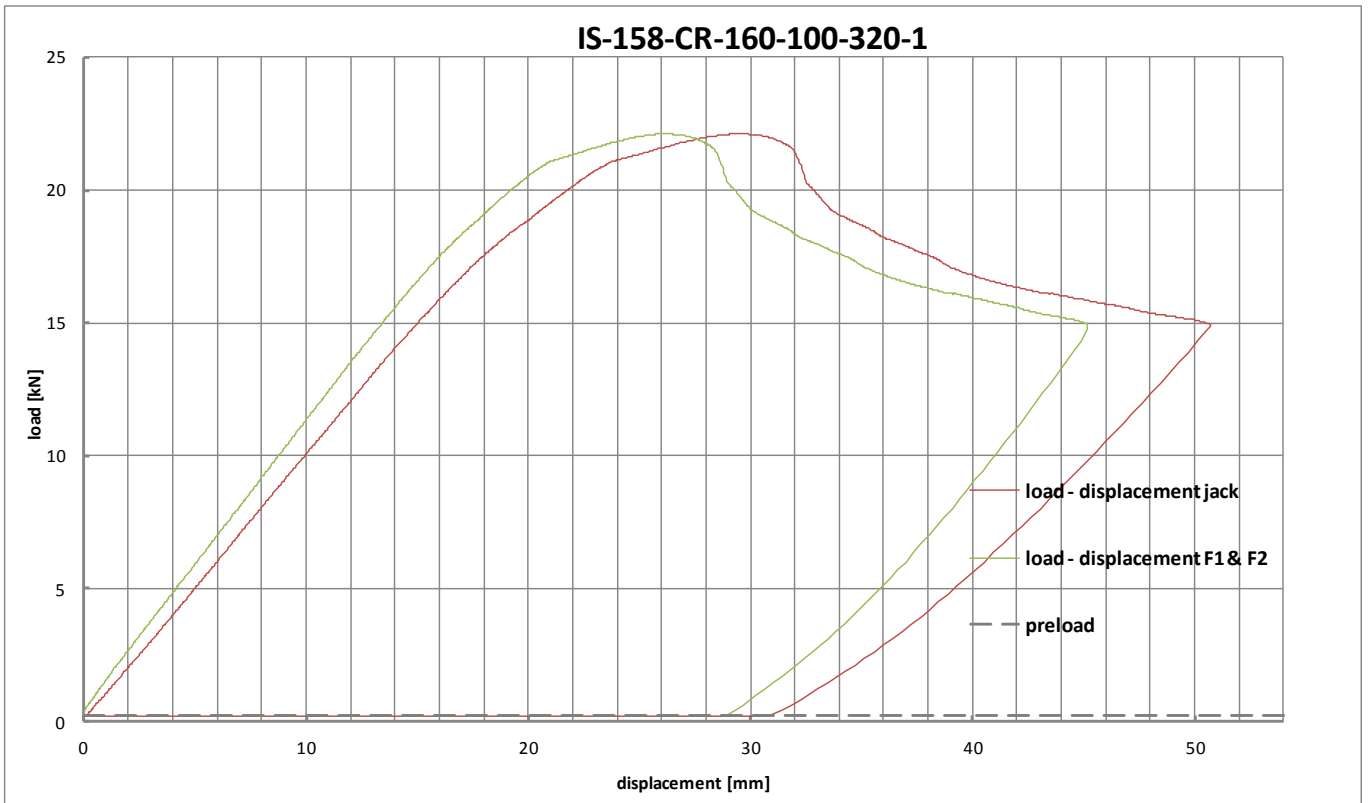
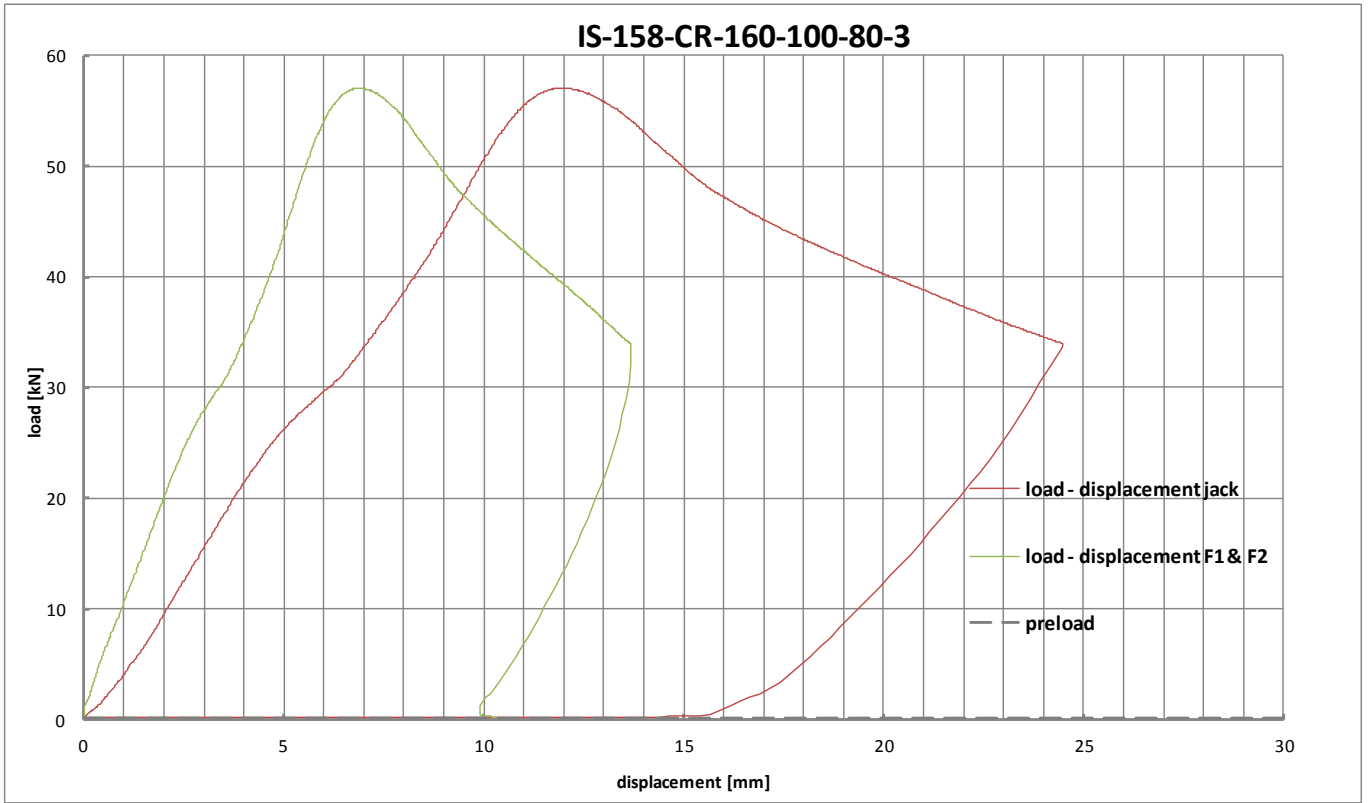


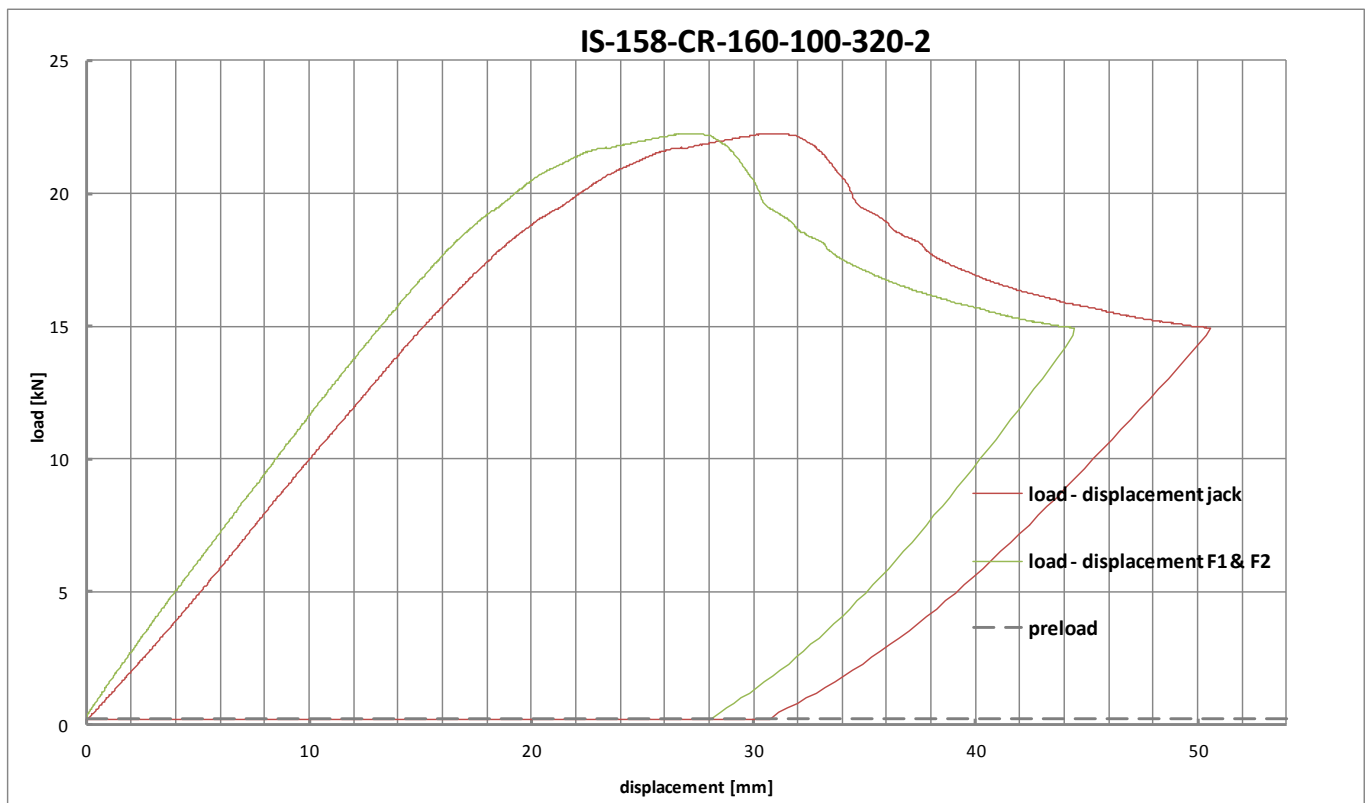




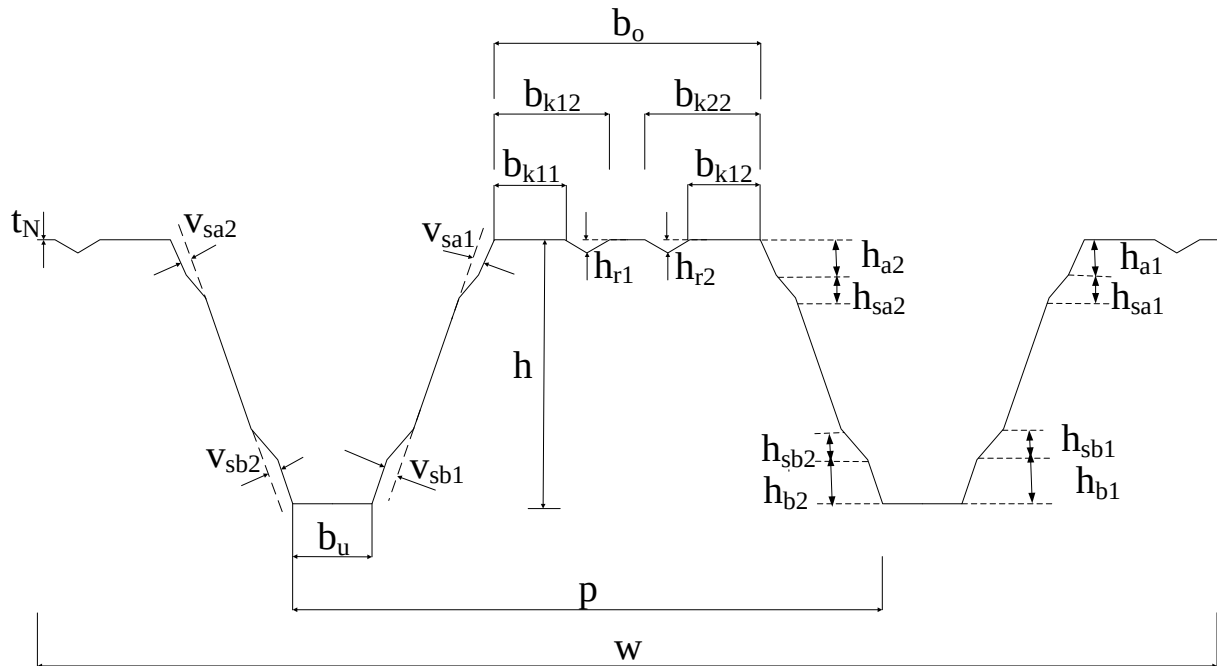








3 Annex C: Measurement of the profile geometry



	Profil 137 t _N = 0.75 mm																	
	1st Rib		2nd Rib		3rd Rib		1st Rib		2nd Rib		3rd Rib		1st Rib		2nd Rib		3rd Rib	
Thickness t _N	0,716		0,72		0,725		0,72		0,72		0,73		0,719		0,717		0,718	
Depth of profile h	136,5			136			136,5			135,5			137			137		
Position of web stiff. h _{a1} /h _{a2}	-	17,8	17,9	17,2	17,9	-	-	16	17,6	16,3	16,5	-	-	16,8	16,7	16,8	15,9	-
Position of web stiff. h _{sa1} /h _{sa2}	-	14,6	15,2	14,8	13,8	-	-	15,3	13,8	15	15,1	-	-	15,5	15,7	15,6	17,3	-
Depth of web stiffeners v _{sa1} /v _{sa2}	-	6,6	5,4	6,2	6,2	-	-	6,6	5,2	6,5	6,2	-	-	6,4	6,2	5,6	6,4	-
Depth of stiffeners h _{r1} /h _{r2}	-	4,9	4,4	4,7	4,8	-	-	4	4,9	4,7	5,3	4,8	-	5	4,8	4,6	4,8	-
Widths of crown b _o	-		145		-		-		145		-		-		144,5		-	
Position of flange stiff. b _{k11} /b _{k21}	-	39,5	41	40,5	41	-	-	38,5	40	40,5	41	-	-	41	39,5	40,5	38	-
Position of flange stiff. b _{k12} /b _{k22}	-	60	60	59,5	59,5	-	-	59	60	59,5	60,5	-	-	60	59,5	60,5	58,5	-
Crown curvature h _e	-		-1		-		-		-1,3		-		-		-1,6		-	
Position of web stiff. h _{b1} /h _{b2}	-	17,5	17,9	17,5	16,4	-	-	16,7	17,1	17,5	16,9	-	-	16,4	16,6	16,8	16,9	-
Position of web stiff. h _{sb1} /h _{sb2}	-	16,3	14,6	16,2	15	-	-	16,2	16,2	15,8	15,6	-	-	15,6	17,4	16	16,4	-
Depth of web stiffeners v _{sb1} /v _{sb2}	-	5,7	5,8	5,9	5,4	-	-	5,5	5,3	5,9	5,9	-	-	5,7	5,9	5,6	5,5	-
Widths of valley b _u	42			43			42			42			42			42		
Lenght of the profile l	2802						1100						1101					
pitch p	306,5						307						306					
Radius of bends r _o , r _u	5,5			5			6			6			5,5			5,5		

	Profil 137 $t_N = 1.00$ mm														
	1st Rib			2nd Rib			3rd Rib			1st Rib			2nd Rib		
Thickness t_N	0,98			0,983			0,977			0,981			0,993		
Depth of profile h	1367,6			138,6			138,1			138,2,5			136,5		
Position of web stiff. h_{a1}/h_{a2}	-	17,1	17,1	17,6	18,4	-	-	18,6	17,2	17,8	17,3	-	-	18,5	17,3
Position of web stiff. h_{sa1}/h_{sa2}	-	16,1	16	15,6	15,9	-	-	15,5	16,4	14,8	16	-	-	15,1	15,5
Depth of web stiffeners v_{sa1}/v_{sa2}	-	7	6,3	6,7	6,8	-	-	6	6,6	6	6,6	-	-	6,4	6,7
Depth of stiffeners h_{r1}/h_{r2}	-	4,9	4,8	4,8	4,3	-	-	4,3	4,4	4,4	4,3	-	-	4,6	4,3
Widths of crown b_o	-			145			-			145,5			-		
Position of flange stiff. b_{k11}/b_{k21}	-	40,5	41	40,5	41	-	-	41	41	40,5	41,5	-	-	39,5	41,5
Position of flange stiff. b_{k12}/b_{k22}	-	58,5	59	58,5	59,5	-	-	59,5	58,5	58,5	59	-	-	59	61
Crown curvature h_e	-			-			-			-			-		
Position of web stiff. h_{b1}/h_{b2}	-	17,1	17,9	17,5	17	-	-	17,2	17,4	17	17,3	-	-	17,7	17,3
Position of web stiff. h_{sb1}/h_{sb2}	-	16,3	15,7	15,5	15,4	-	-	16,3	16,4	15,5	16	-	-	15,8	15,4
Depth of web stiffeners v_{sb1}/v_{sb2}	-	6,9	6,2	6,8	5,5	-	-	6,7	6,5	6,3	5,6	-	-	6	6,3
Widths of valley b_u	43			42,5			43			43			43,5		
Length of the profile l	-			-			-			-			-		
Cover width w	626			626			624			624			626		
Radius of bends r_o, r_u	5,5			5			5,5			5			5,5		

	Profil 158 $t_N = 0.75$ mm														
	1st Rib			2nd Rib			3rd Rib			1st Rib			2nd Rib		
Thickness t_N	0,729			0,727			0,727			0,729			0,734		
Depth of profile h	159			158,5			159			160,5			159,5		
Position of web stiff. h_{a1}/h_{a2}	-	38	37,2	36,6	37	-	-	36,7	37,4	37,1	36,9	-	-	36,5	36,8
Position of web stiff. h_{sa1}/h_{sa2}	-	14	13,5	13,3	13	-	-	13,2	13,1	12,9	12,6	-	-	13,6	12,8
Depth of web stiffeners v_{sa1}/v_{sa2}	-	6,7	5,4	6,8	6,1	-	-	5,9	6,1	6	5,6	-	-	6,3	5,9
Depth of stiffeners h_{r1}	(7,0)			7,7			(7,2)			8,4			(6,8)		
Widths of crown b_o	-			118			-			118			-		
Position of flange stiff. b_{k1}/b_{k2}	-	-	47	47,5	-	-	-	-	48	47	-	-	-	-	47
Position of web stiff. h_{b1}/h_{b2}	-	31,3	32	32,8	33,2	-	-	32,5	31,8	32,4	32,1	-	-	31,5	32,3
Position of web stiff. h_{sb1}/h_{sb2}	-	12,2	13,2	12,5	13,2	-	-	14	14,1	13,8	13,9	-	-	13,4	13,5
Depth of web stiffeners v_{sb1}/v_{sb2}	-	6,4	5,8	6,5	6,1	-	-	6,3	6,1	6,4	6	-	-	6,5	5,8
Widths of valley b_u	39,5			40			40			39,5			39,5		
Length of the profile l	1500			1500			1498			1498			1299		
pitch p	240			240			238			238			241		
Radius of bends r_o, r_u	4,5			5			5			5			4,5		

	Profil 158 t _N = 1.00 mm																	
	1st Rib		2nd Rib		3rd Rib		1st Rib		2nd Rib		3rd Rib		1st Rib		2nd Rib		3rd Rib	
Thickness t _N	0,982		0,983		0,984		0,98		0,986		0,985		0,98		0,986		0,984	
Depth of profile h	159			159			159			159,5			158,5			157,5		
Position of web stiff. h _{a1} /h _{a2}	-	38	35,6	37,6	37	-	-	36,8	36,7	38,1	37,7	-	-	37,2	36,8	36,7	36,3	-
Position of web stiff. h _{sa1} /h _{sa2}	-	13	12,7	13,2	13,3	-	-	13,4	13,6	13,9	14	-	-	14,9	13,9	14,6	14,5	-
Depth of web stiffeners v _{sa1} /v _{sa2}	-	6,8	7,1	6,5	7,2	-	-	7,3	7	6,5	6,9	-	-	8,1	8,2	7,2	7,8	-
Depth of stiffeners h _{r1}	(7,1)		7,5		(7,4)		(7,2)		7,1		(7,6)		(6,8)		7,2		(6,7)	
Widths of crown b _o	-		119		-		-		119		-		-		119		-	
Position of flange stiff. b _{k1} /b _{k2}	-	-	46	47	-	-	-	-	47	46,5	-	-	-	-	47	47,5	-	-
Position of web stiff. h _{b1} /h _{b2}	-	32,6	33	31,9	32,9	-	-	31,7	32,2	31,4	32,5	-	-	31,8	31,8	31,7	31,9	-
Position of web stiff. h _{sb1} /h _{sb2}	-	13,3	13,1	12,8	13,4	-	-	12,5	13	13,1	13,2	-	-	13,5	13,7	13,7	13,8	-
Depth of web stiffeners v _{sb1} /v _{sb2}	-	6,7	6,3	7,1	6,2	-	-	7	6	6,6	6	-	-	6,7	8	7,4	7,6	-
Widths of valley b _u	40,5			40			40			40			40			40		
Lenght of the profile l	1300						1500						1300					
pitch p	243						242,5						246					
Radius of bends r _o , r _u	4,5			4,5			5			5			4,5			4,5		