

2014/2219 Tri-point crack analysis

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Specimen	PreCrack [in]	EDM Notch [in]	Test Environment	Plug Flaw Location	L/R	PWHT
CB 180-P3	0.380	0.33	RT	M3 Major TP Ret	Left	N
CB 185-P2	0.380	0.33	RT	M5 Major TP Ret	Right	Y
CXO5-P1	0.380	0.33	RT	M3 Major TP Ret	Right	Y
CXO5-P2	0.200	0.15	RT	M3 Major on Plug Ret	Right	Y

Table 1: Test matrix for first pathfinder test series of 2014/2219
M3 and M5 plug welds .

Pre-Crack Setup



Specimen	PWHT	Plug	2c	a	Cycles	lbs	Test Temp
CB 180-P3	N	M3	0.402	0.181	11,100	10,000	70
CB 185-P2	Y	M5	0.39	0.175	10,000	10,000	70
CX05-P1	Y	M3	0.39	0.181	7,000	25,000	70
CX05-P2	Y	M3	0.213	0.1	9,000	25,000	70

Table 2: Pre-crack cycle data

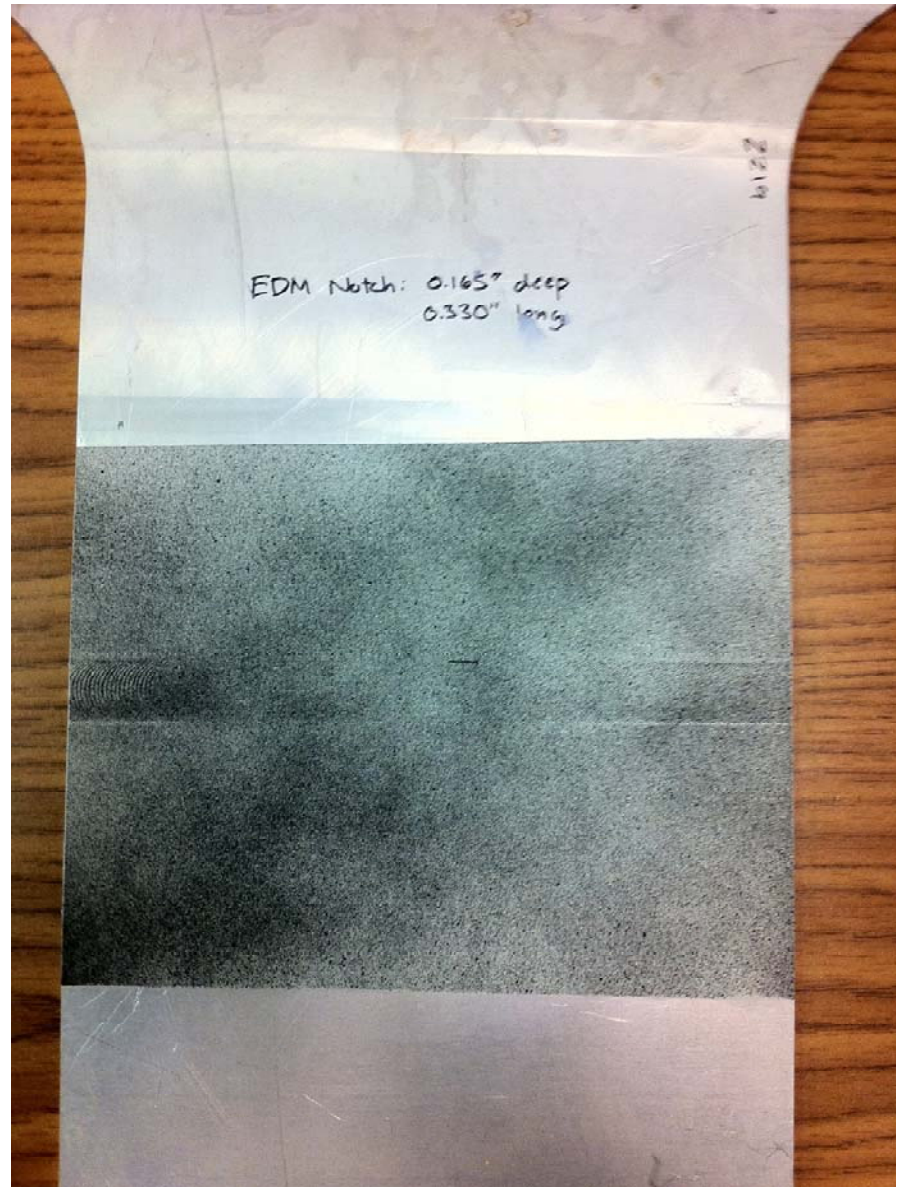
2219

2014

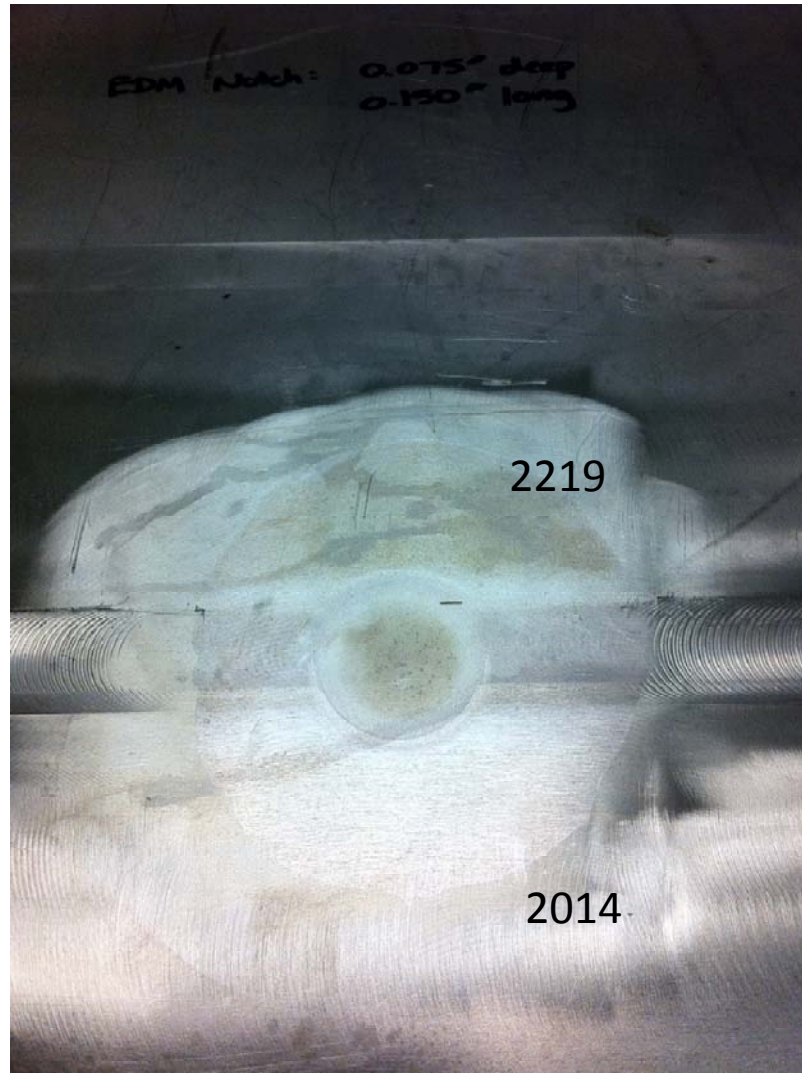
C.B. 175
RT.

x201

5



CX05-P1 crack TP

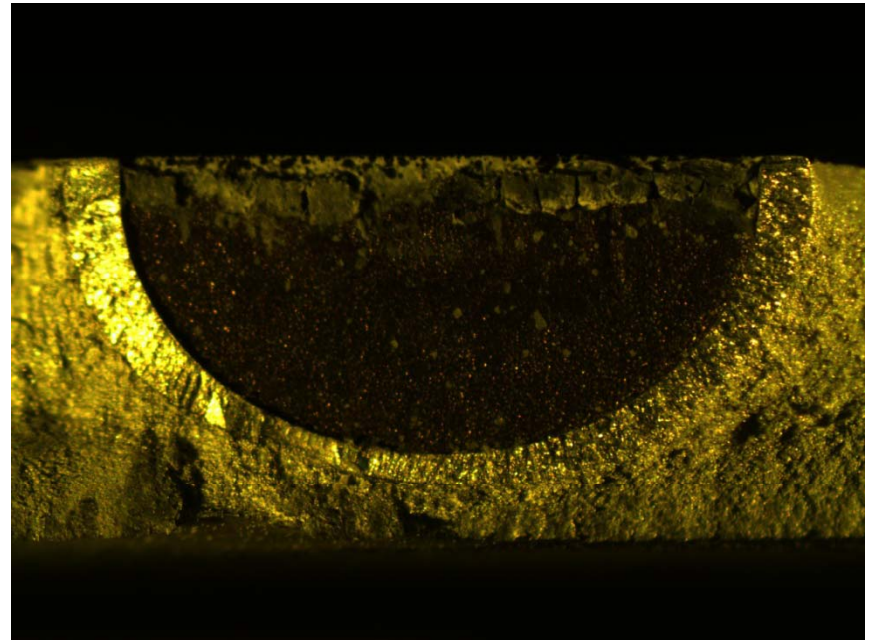
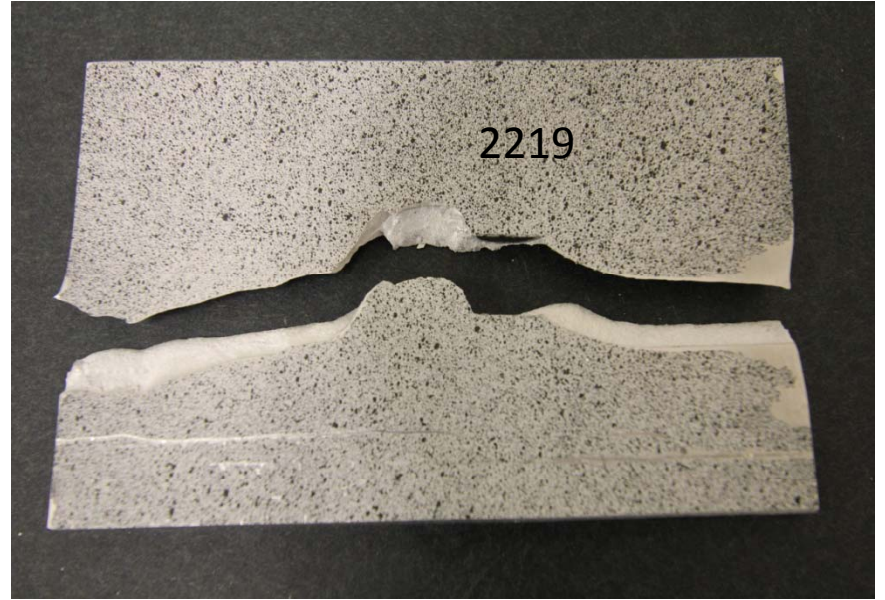
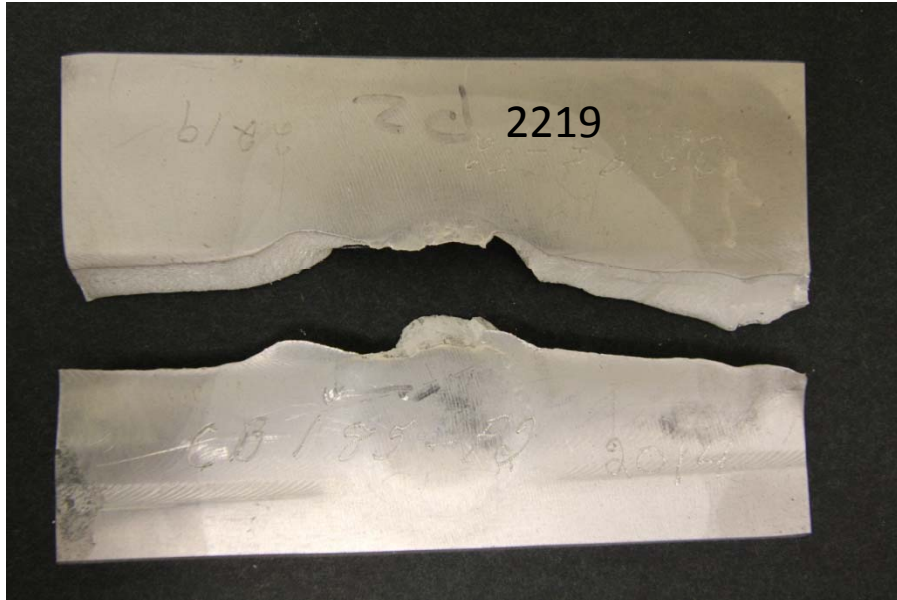


CX05-P2 crack not at TP

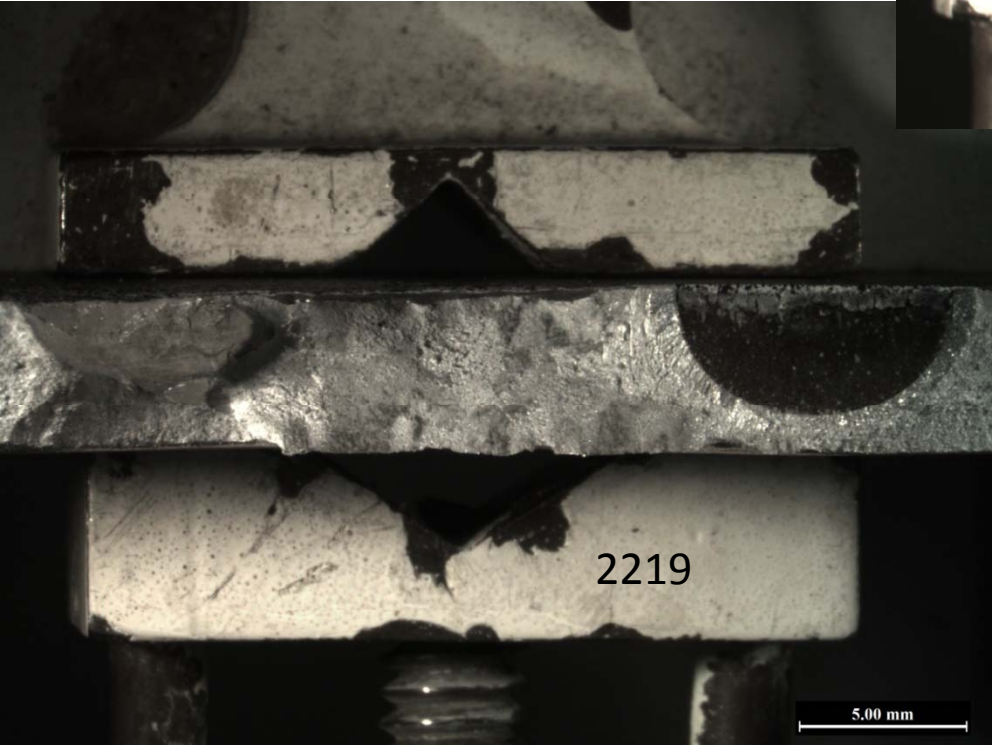
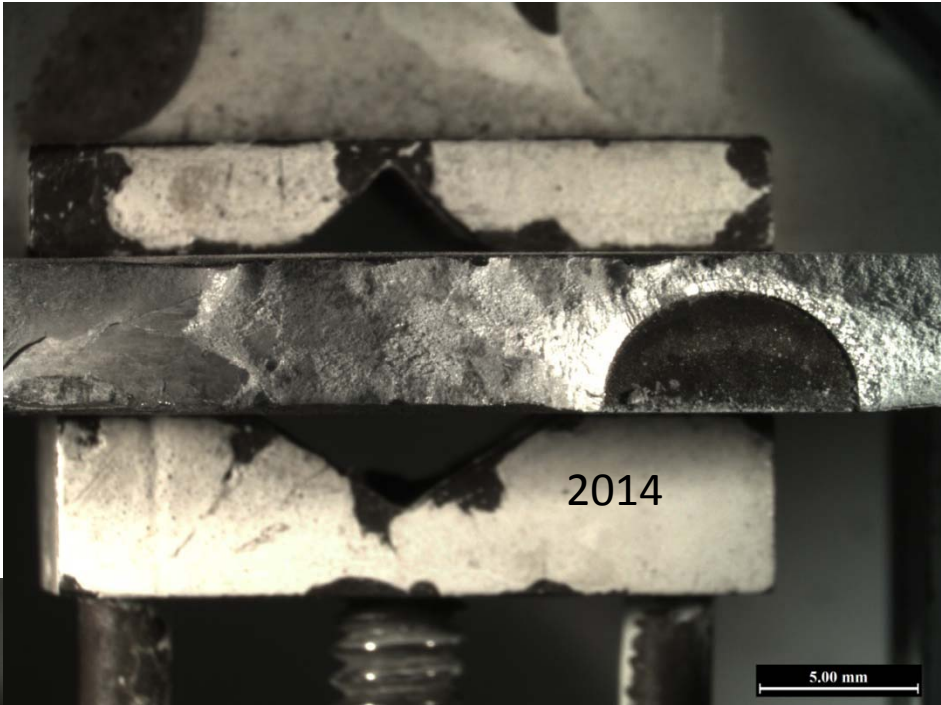
Specimen	PWHT	Plug	2c	a	Test Temp	Failure	Residual Stress (ksi)	Kle Estimate ksi(in) ^{1/2}
CB 180-P3	N	M3	0.402	0.181	70	Precrack	37	22
CB 185-P2	Y	M5	0.39	0.175	70	Precrack	39	23
CXO5-P2	Y	M3	0.394	0.181	70	Precrack	39	23
CXO5-P2	Y	M3	0.213	0.1	70	Precrack	42	17

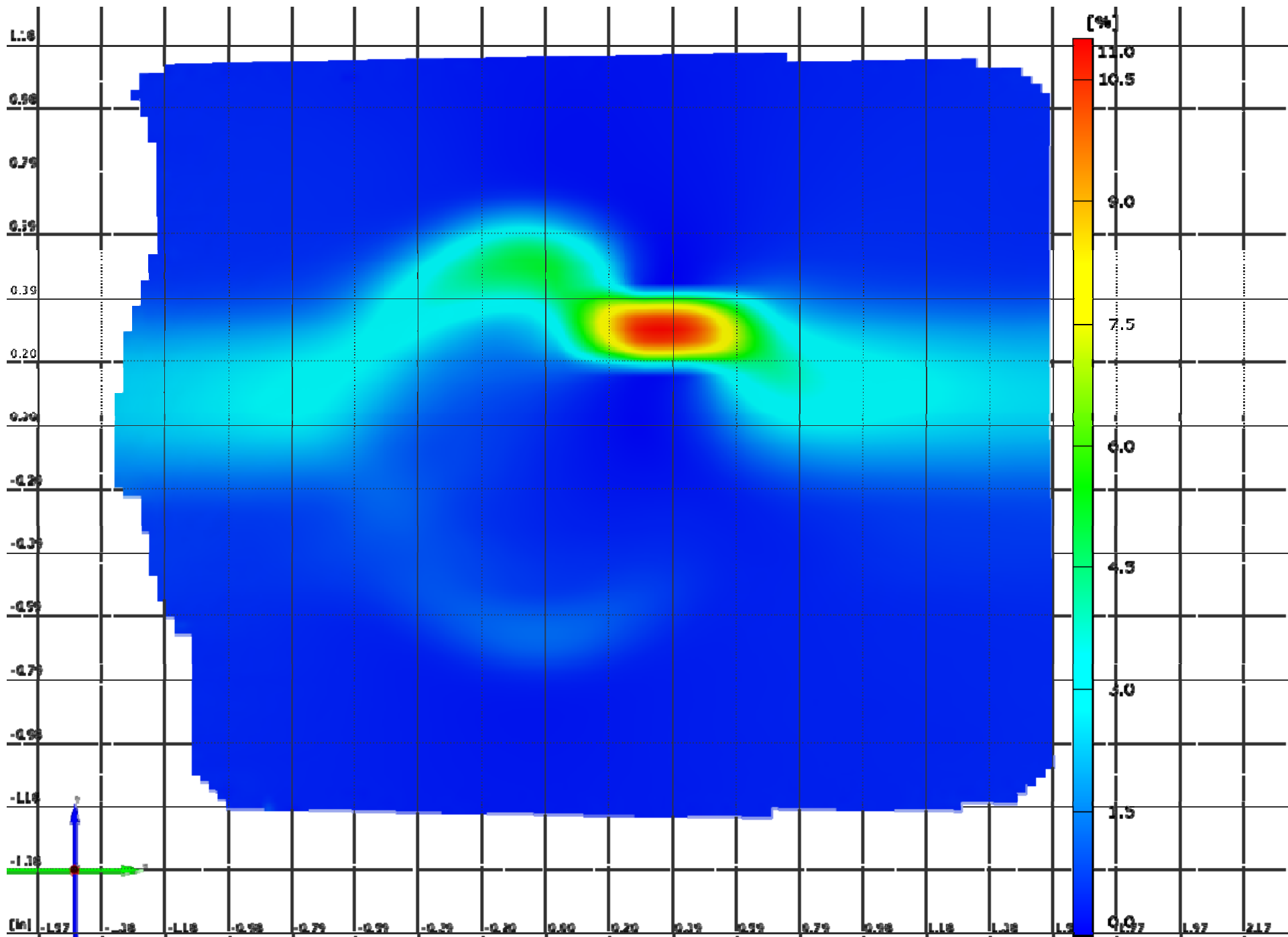
Table 3: Test Results for first pathfinder test series of 2014/2219
M3 and M5 plug welds .

CB 185- P2

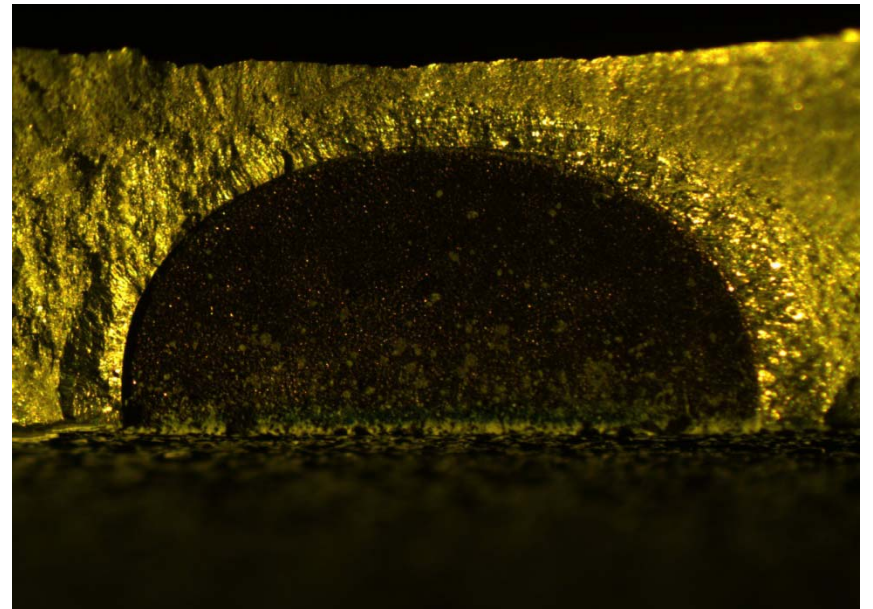
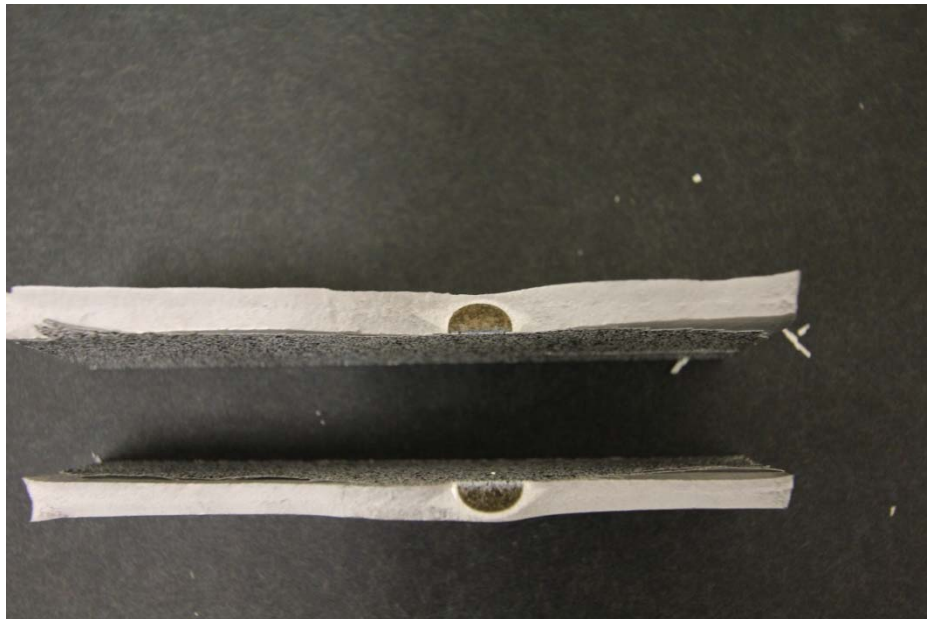
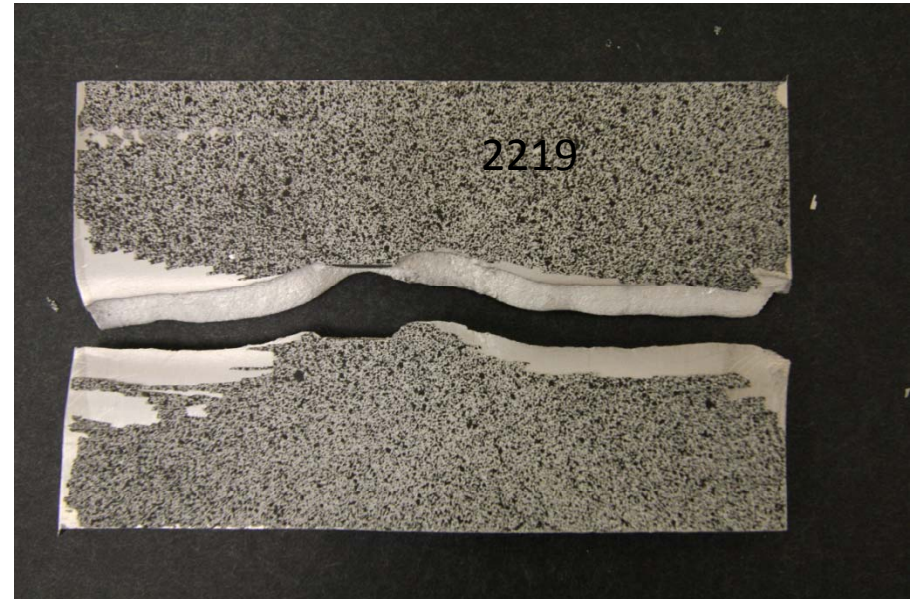


CB 185-P2

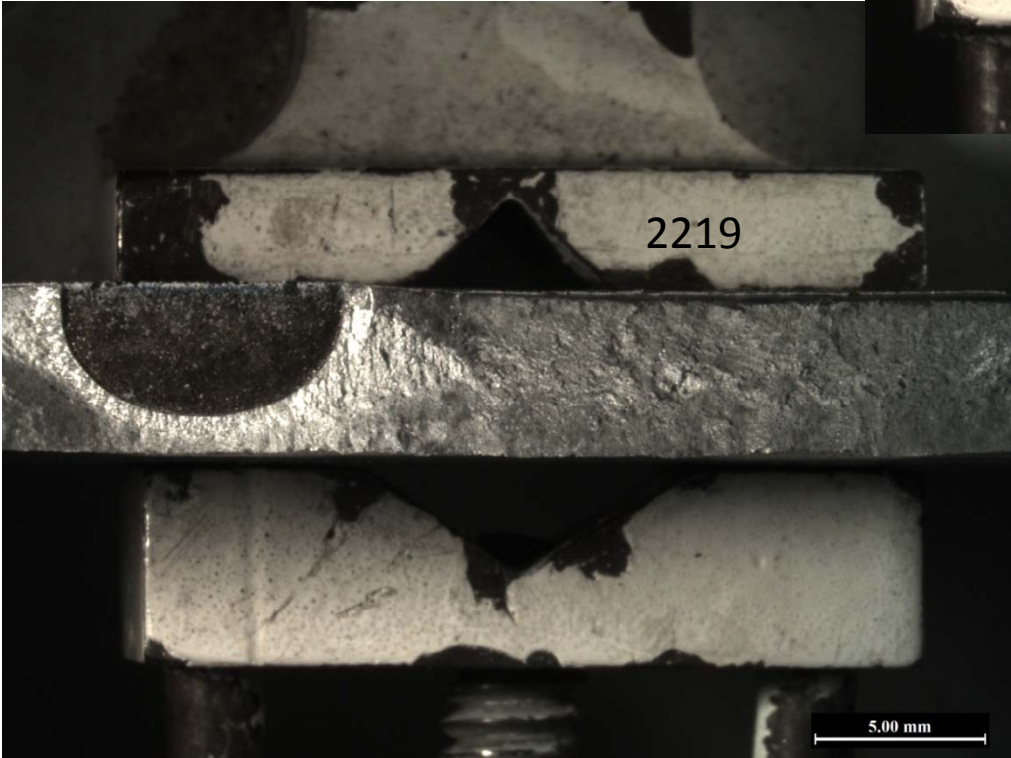
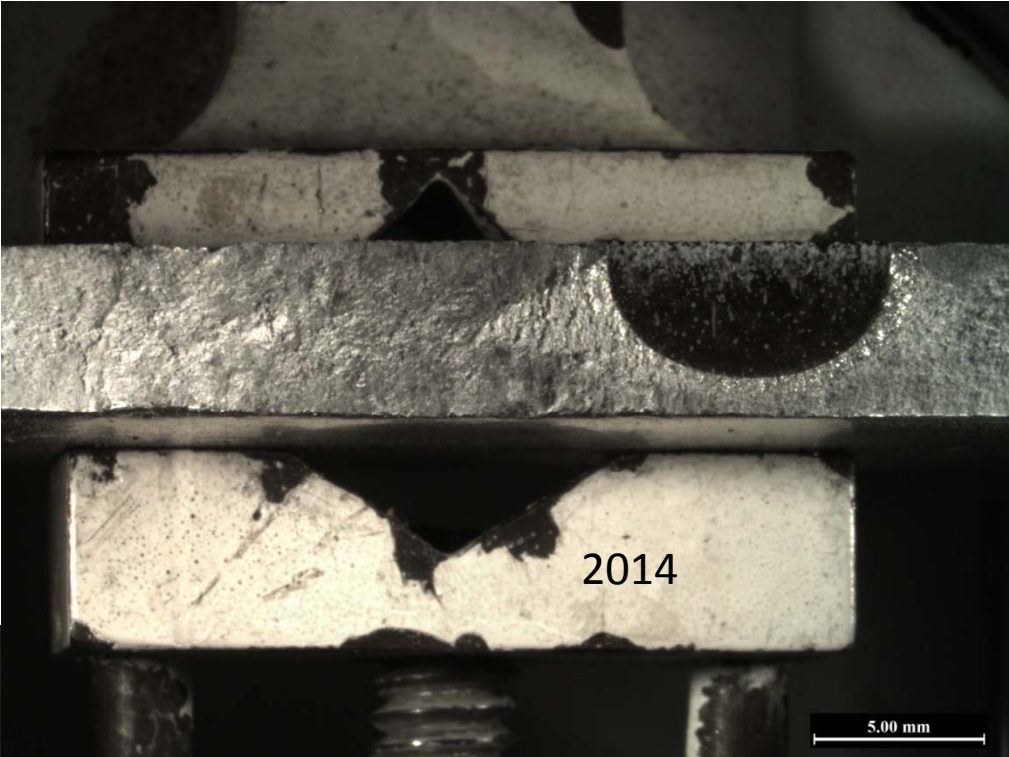


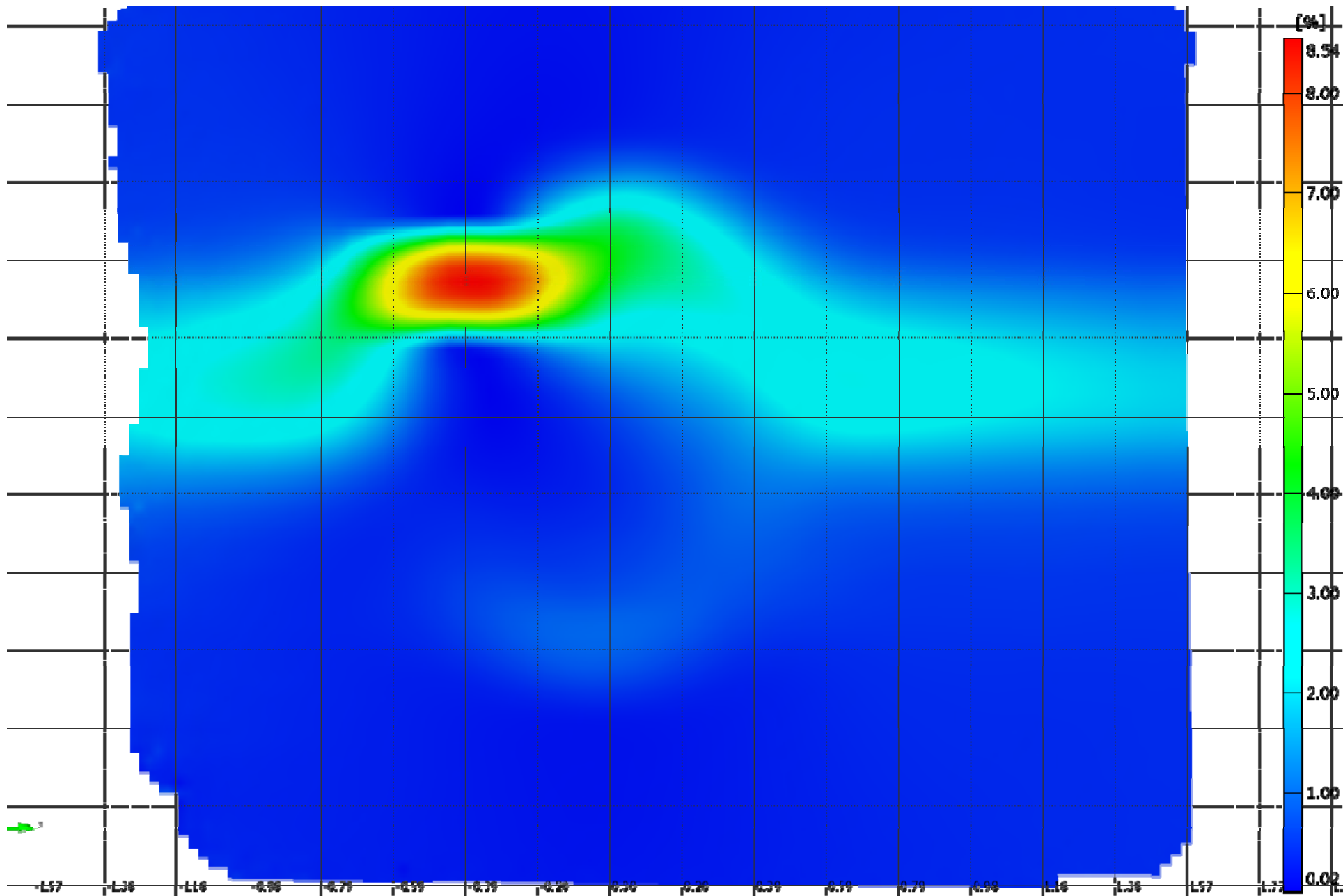


CB 180-P3

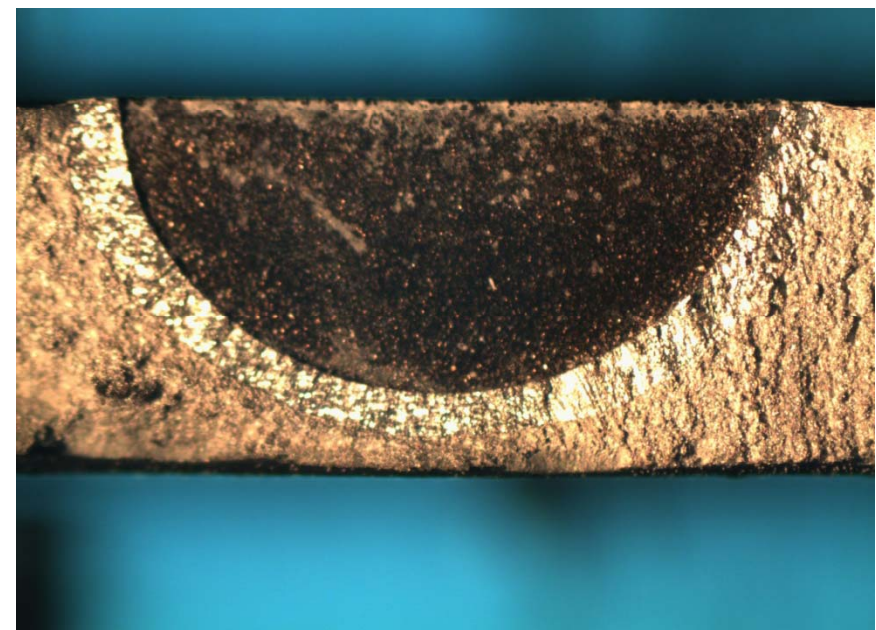
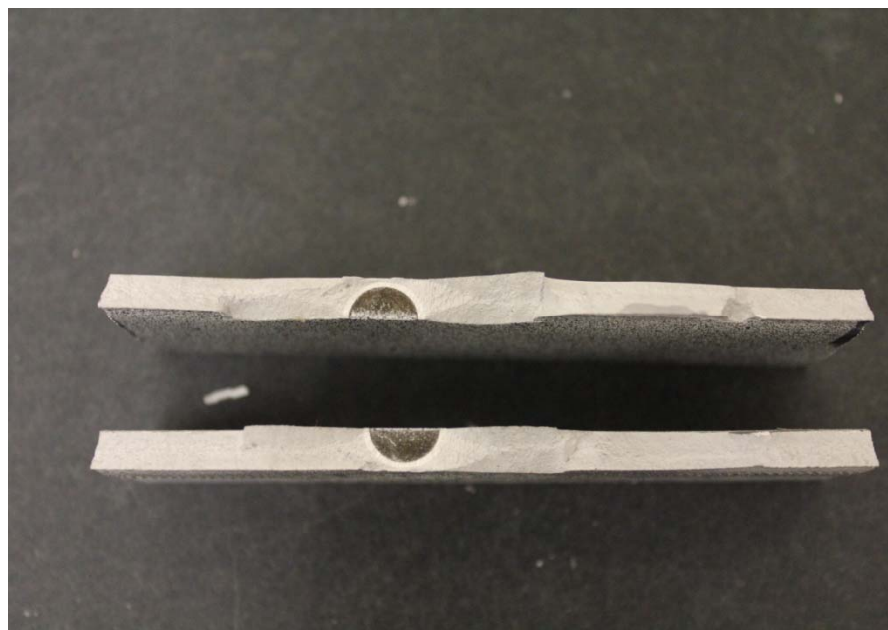
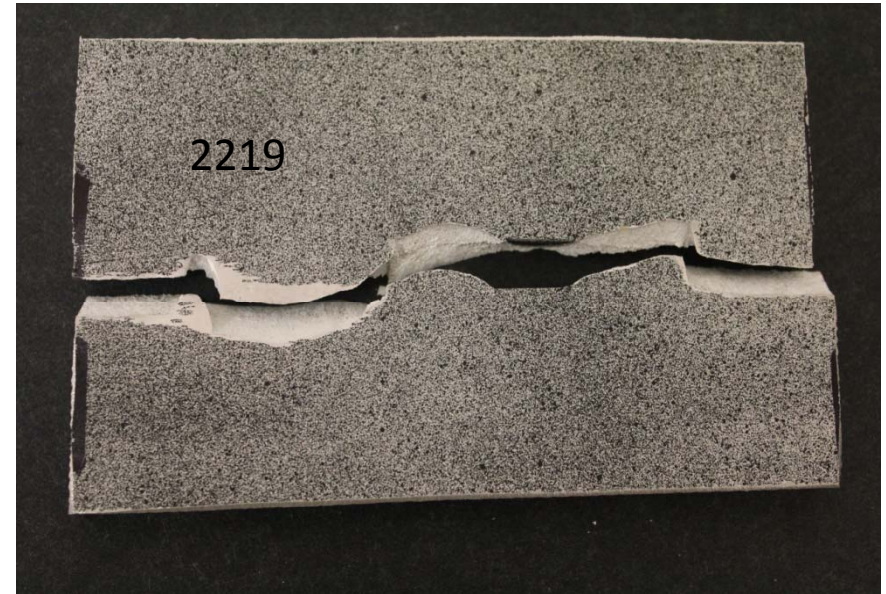
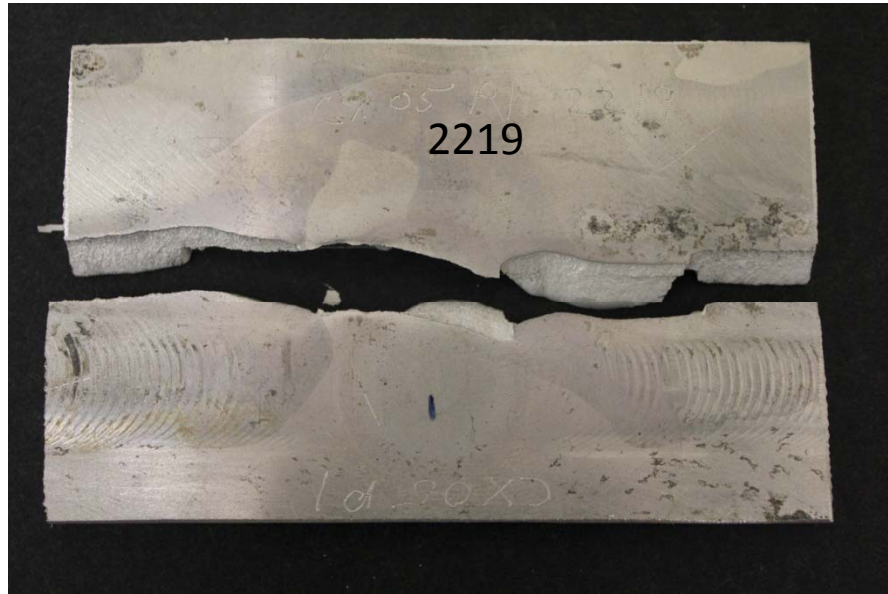


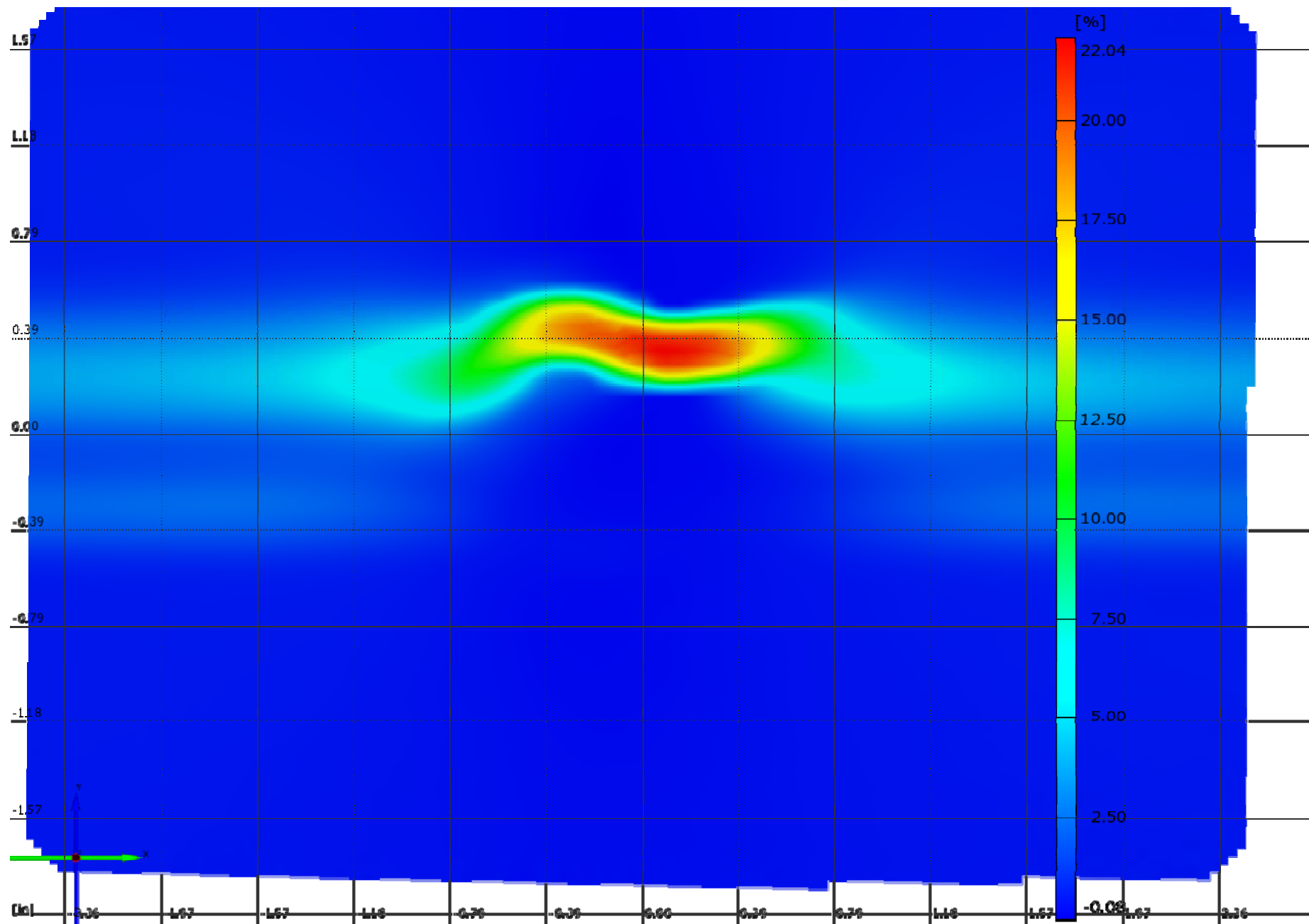
CB 180-P3

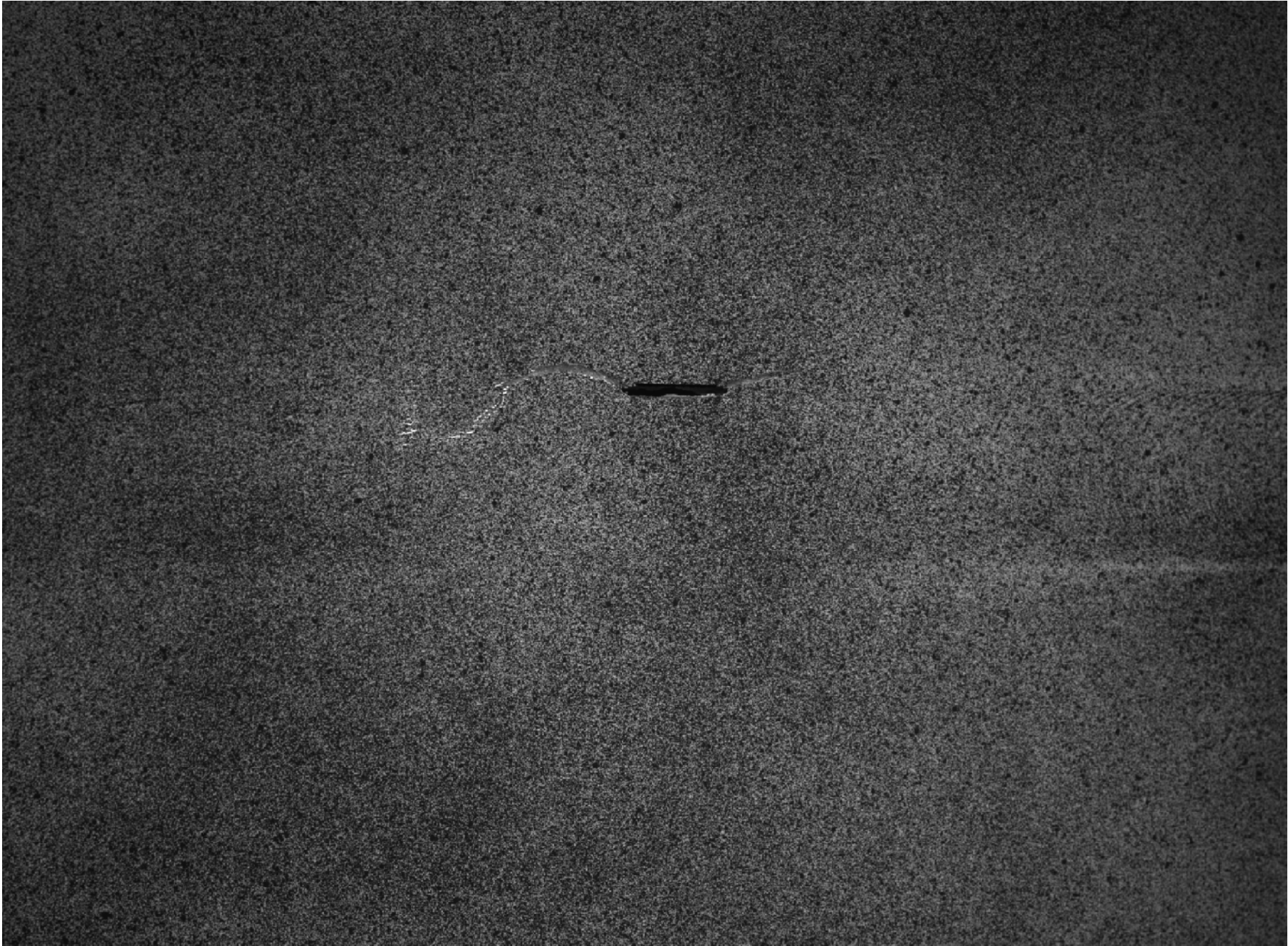




CX05-P1

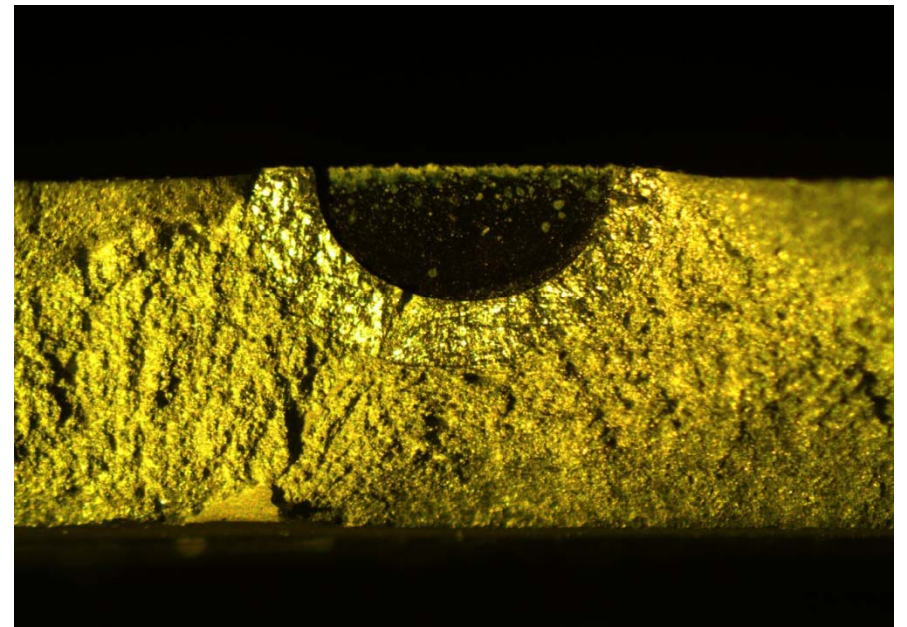
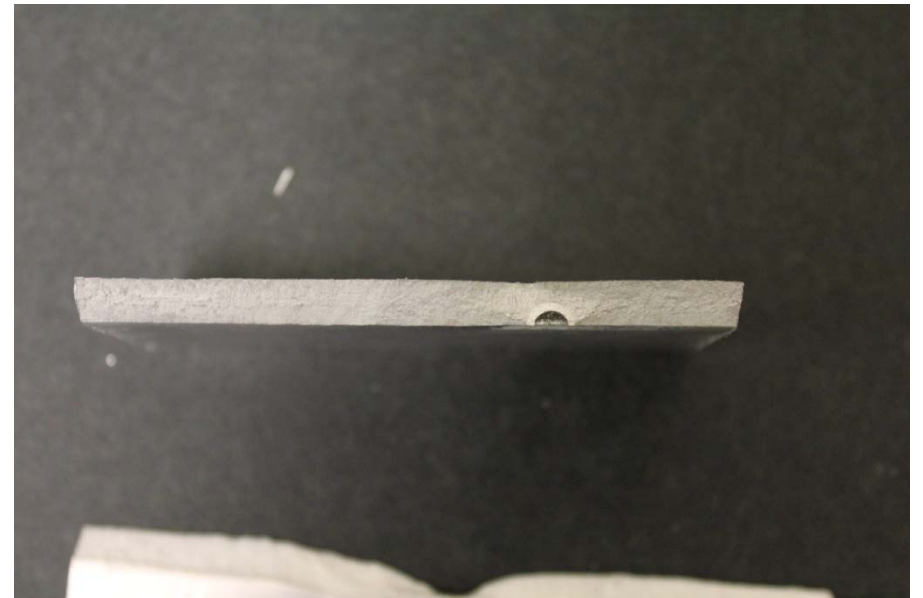
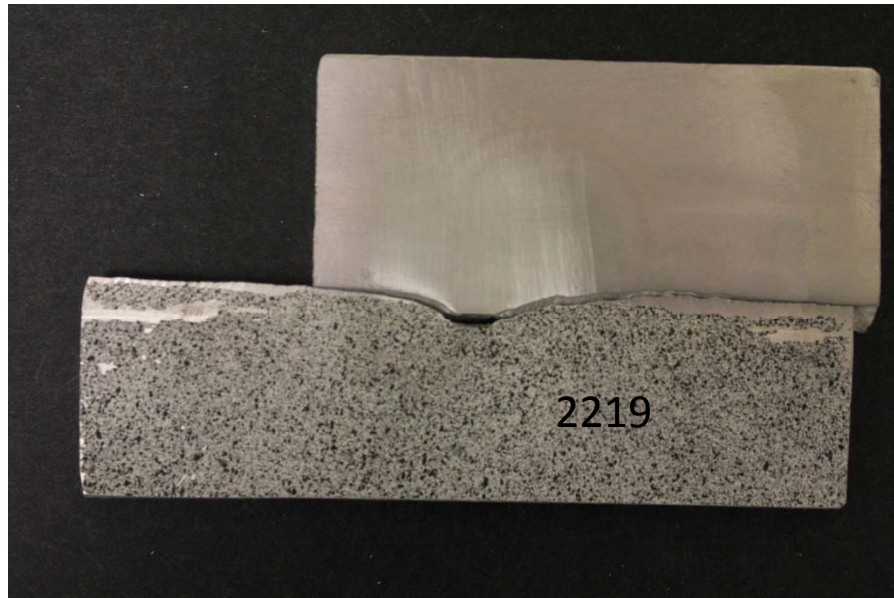


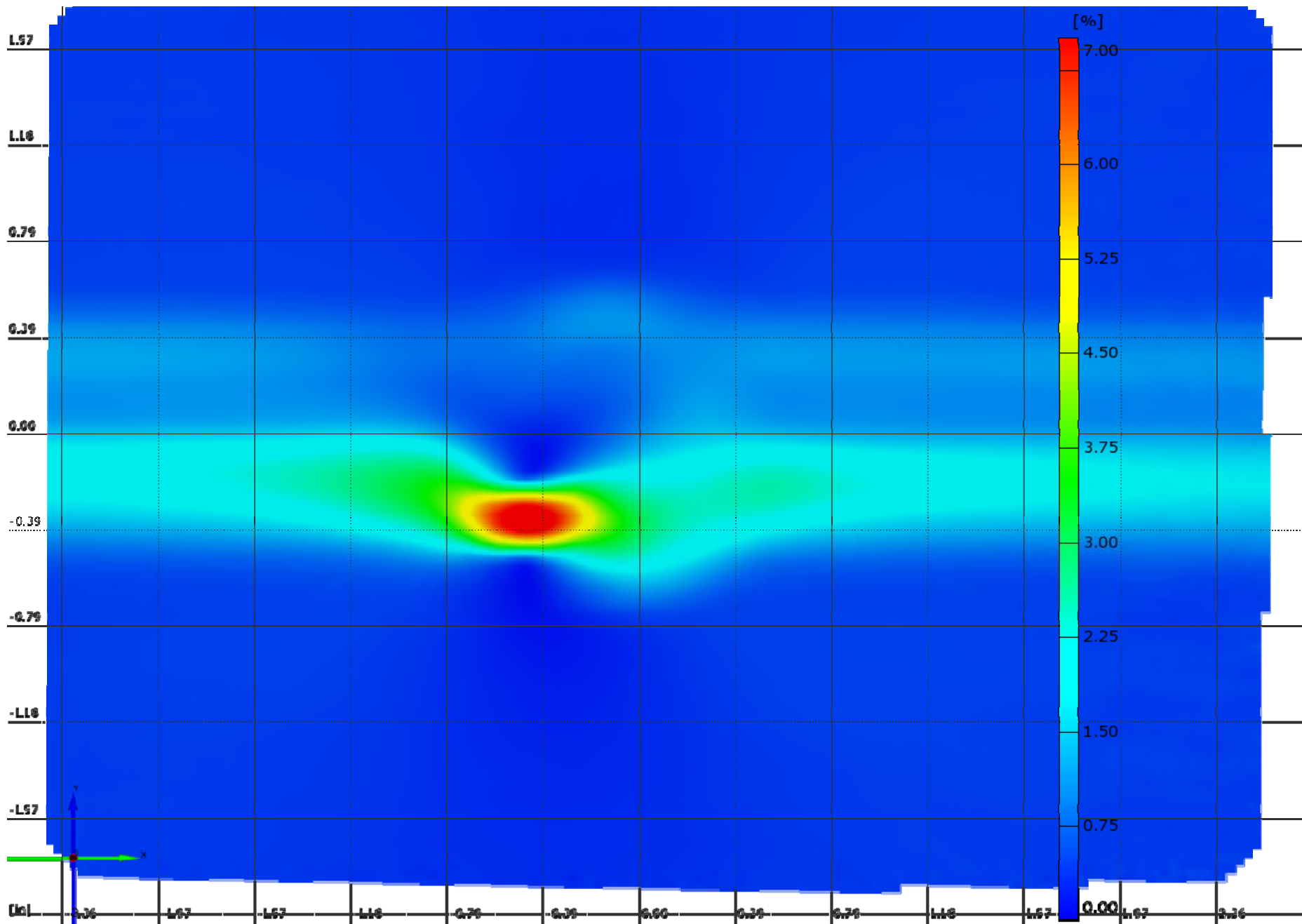


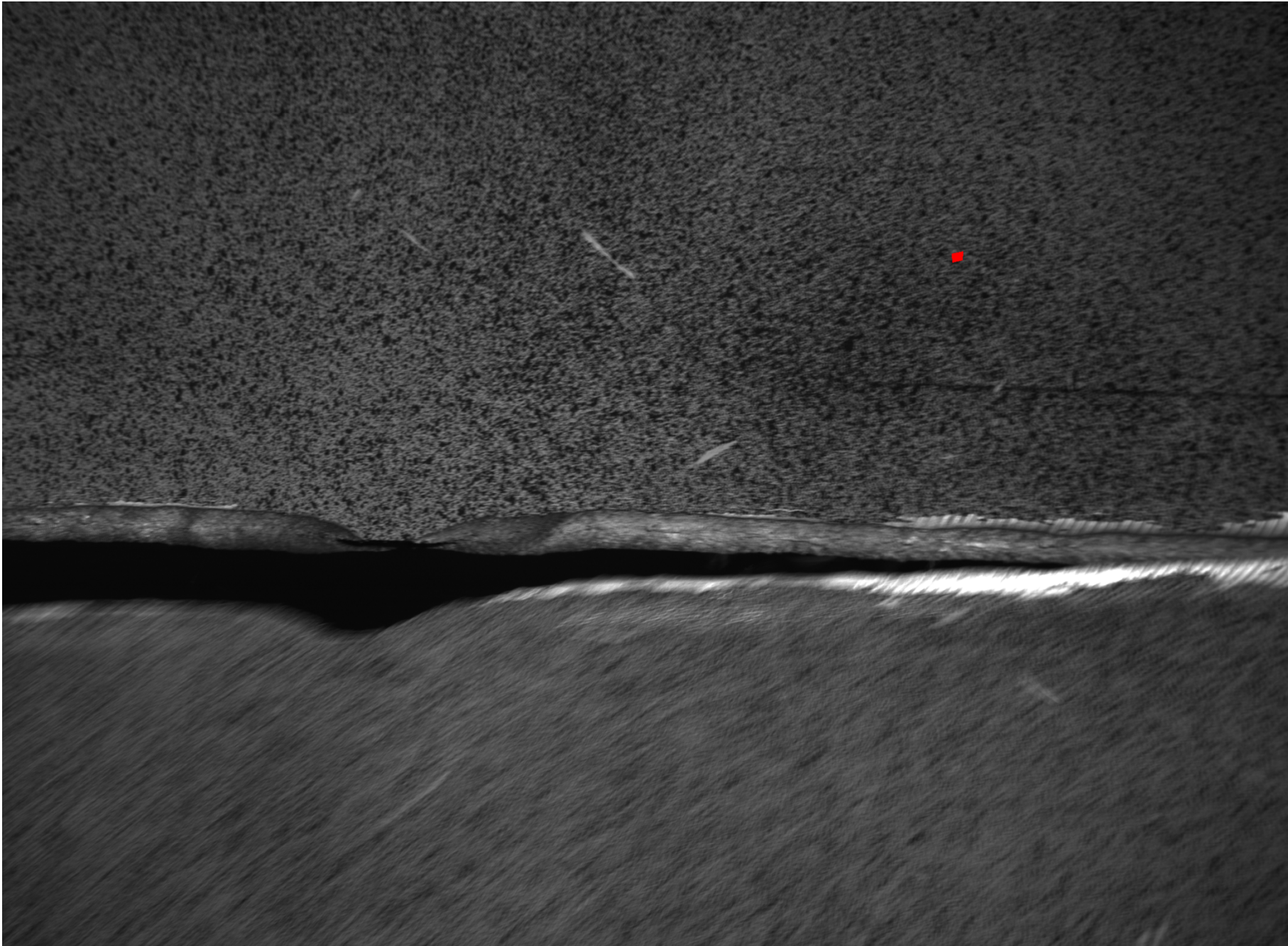




CX05-P2







Sample Size	Plug Size	Average Ultimate Stress (ksi)	Weld Efficiency (%)
Initial	N/A	54	-
4"	M3	52	98%
4"	M5	52	97%
8.5"	M3	55	102%
8.5"	M5	52	97%

Table 4: Test Results for test series of 2014/2219 M3 and M5 plug welds with no flaws

Sample Size	Plug Size	Flaw size 2c/a	Average Ultimate Stress (ksi)	Weld Efficiency (%)
Initial	N/A	N/A	54	-
4"	M3	N/A	52	98%
4"	M5	N/A	52	97%
8.5"	M3	N/A	55	102%
8.5"	M5	N/A	52	97%
4"	M3	0.402/0.181	37	69%
4"	M5	0.39/0.175	39	72%
8.5"	M3	0.394/0.181	39	72%
8.5"	M3	0.213/0.1	42	78%

Table 5: Comparison test Results for test series of 2014/2219
M3 and M5 plug welds

