Pixel Forward BumpBond layer per ROC (Material name: Pix_Fwd_Bump)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Bump Bonds	FPix_TinLeadSolder	0.9360E-04	100.000	0.8237E-03	100.000	8.800	0.839	100.000	21.380	100.000

Mixture density [g/cm^3]	8.80000
Norm. mixture density [g/cm^3]	0.41391
Mixture Volume [cm^3]	0.00009
MC Volume [cm^3]	0.00199
MC Area [cm^2]	1.00000
Normalization factor	0.04704
Mixture X_0 [cm]	0.83877
Norm. Mixture X_0 [cm]	17.83282
Norm. Mixture X_0 (%)	0.01116
Mixture λ_0 [cm]	21.38030
Norm. Mixture λ_0 [cm]	454.55981
Norm. Mixture λ_0 (%)	0.00044
Total weight (g)	0.00082

X_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	1.000

λ_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	1.000

Pixel Forward VHDI (Material name: Pix_Fwd_VHDI)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	VHDI: Kapton	FPix_Kapton	0.5448	76.477	0.7627	34.454	1.400	28.983	13.865	56.623	47.497
2	VHDI: Copper	Copper	0.1453	20.397	1.3019	58.810	8.960	1.435	74.672	15.056	47.641
3	Capacitors	Barium_Titanate	0.1688E-01	2.369	0.1016E+00	4.589	6.020	1.854	6.714	23.039	3.616
4	Solders	FPix_TinLeadSolder	0.5400E-02	0.758	0.4752E-01	2.147	8.800	0.839	4.749	21.380	1.247

Mixture density [g/cm^3]	3.10751
Norm. mixture density [g/cm^3]	3.10740
Mixture Volume [cm^3]	0.71237
MC Volume [cm^3]	0.71240
MC Area [cm^2]	60.53260
Normalization factor	0.99996
Mixture X_0 [cm]	5.25464
Norm. Mixture X_0 [cm]	5.25482
Norm. Mixture X_0 (%)	0.22396
Mixture λ_0 [cm]	35.16663
Norm. Mixture λ_0 [cm]	35.16787
Norm. Mixture λ_0 (%)	0.03346
Total weight (g)	2.21372

X_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	1.000

λ_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	1.000

Pixel Forward AgEpoxy VHDI-ROC (Material name: Pix_Fwd_AgEpoxy)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Acrylic is epoxy	FPix_Epoxy	0.8950E-01	14.288	0.9845E-01	9.823	1.100	37.509	8.580	69.472	10.328
2	BN powder	FPix_BNPowder	0.8950E-01	14.288	0.3133E+00	31.254	3.500	12.432	25.887	23.256	30.853
3	Silicone	FPix_Silicone	0.3579	57.136	0.4653	46.422	1.300	23.643	54.430	62.176	46.147
4	Polyimide is kapton	FPix_Kapton	0.8950E-01	14.288	0.1253E+00	12.502	1.400	28.983	11.104	56.623	12.672

Mixture density [g/cm^3]	1.60005
Norm. mixture density [g/cm^3]	1.60005
Mixture Volume [cm^3]	0.62640
MC Volume [cm^3]	0.62640
MC Area [cm^2]	1.00000
Normalization factor	1.00000
Mixture X_0 [cm]	22.52363
Norm. Mixture X_0 [cm]	22.52363
Norm. Mixture X_0 (%)	2.78108
Mixture λ_0 [cm]	50.21786
Norm. Mixture λ_0 [cm]	50.21786
Norm. Mixture λ_0 (%)	1.24736
Total weight (g)	1.00227

X_0 contribution	
Support:	0.889
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	0.111

λ_0 contribution	
Support:	0.873
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	0.127

Pixel Forward AdhFilm 3M 9882 (Material name: Pix_Fwd_AdhFilm)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Acrylic is epoxy	FPix_Epoxy	0.2421	80.007	0.2663	55.706	1.100	37.509	57.013	69.472	57.257
2	Ceramic	FPix_BNPowder	0.6050E-01	19.993	0.2118E+00	44.294	3.500	12.432	42.987	23.256	42.743

Mixture density [g/cm^3]	1.57984
Norm. mixture density [g/cm^3]	1.57984
Mixture Volume [cm^3]	0.30260
MC Volume [cm^3]	0.30260
MC Area [cm^2]	1.00000
Normalization factor	1.00000
Mixture X_0 [cm]	26.72896
Norm. Mixture X_0 [cm]	26.72896
Norm. Mixture X_0 (%)	1.13211
Mixture λ_0 [cm]	49.71748
Norm. Mixture λ_0 [cm]	49.71748
Norm. Mixture λ_0 (%)	0.60864
Total weight (g)	0.47806

X_0 contribution	
Support:	1.000
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	0.000

λ_0 contribution	
Support:	1.000
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	0.000

Pixel Forward HDI (Material name: Pix_Fwd_HDI)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Kapton	FPix_Kapton	0.8556	52.691	1.1978	32.989	1.400	28.983	15.107	56.623	41.543
2	Internal flex adhesive is like epoxy	FPix_Epoxy	0.4278	26.346	0.4706	12.960	1.100	37.509	5.837	69.472	16.930
3	Copper	Copper	0.1349	8.308	1.2087	33.288	8.960	1.435	48.097	15.056	24.633
4	Capacitors	Barium_Titanate	0.1900E-02	0.117	0.1144E-01	0.315	6.020	1.854	0.524	23.039	0.227
5	Resistors	FPix_Alumina	0.2200E-02	0.135	0.8712E-02	0.240	3.960	7.055	0.160	24.329	0.249
6	Solders	FPix_TinLeadSolder	0.8500E-02	0.523	0.7480E-01	2.060	8.800	0.839	5.186	21.380	1.093
7	Copper	Copper	0.3620E-01	2.229	0.3244E+00	8.933	8.960	1.435	12.907	15.056	6.610
8	Kapton	FPix_Kapton	0.1087	6.694	0.1522	4.191	1.400	28.983	1.919	56.623	5.278
9	Solders	FPix_TinLeadSolder	0.1200E-01	0.739	0.1056E+00	2.908	8.800	0.839	7.321	21.380	1.543
10	Epoxy	FPix_Epoxy	0.3000E-01	1.848	0.3300E-01	0.909	1.100	37.509	0.409	69.472	1.187
11	Solders Indium	Indium	0.6000E-02	0.370	0.4380E-01	1.206	7.300	1.212	2.533	23.303	0.708

Mixture density [g/cm^3]	2.23612
Norm. mixture density [g/cm^3]	2.23694
Mixture Volume [cm^3]	1.62380
MC Volume [cm^3]	1.62320
MC Area [cm^2]	1.00000
Normalization factor	1.00037
Mixture X_0 [cm]	8.30965
Norm. Mixture X_0 [cm]	8.30658
Norm. Mixture X_0 (%)	19.54114
Mixture λ_0 [cm]	44.64273
Norm. Mixture λ_0 [cm]	44.62624
Norm. Mixture λ_0 (%)	3.63732
Total weight (g)	3.63101

X_0 contribution	
Support:	0.062
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	0.938

λ_0 contribution	
Support:	0.181
Sensitive:	0.000
Cables:	0.000
Cooling:	0.000
Electronics:	0.819

Volume 1 (Material name: Pix_Fwd_Servi_Cylind)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Carbon Fiber	FPix_Cylind_CF	1162.0000	97.238	1737.1901	96.427	1.495	27.645	95.447	51.236	96.810
2	G10	FPix_Cylind_G10	26.0000	2.176	44.2000	2.453	1.700	21.875	2.699	46.936	2.365
3	Aluminium	Aluminium	6.0000	0.502	16.2000	0.899	2.700	8.893	1.532	39.407	0.650
4	Ceramic	Ceramic	1.0000	0.084	3.9653	0.220	3.965	7.046	0.322	24.297	0.176

Mixture density [g/cm^3]	1.50758
Norm. mixture density [g/cm^3]	0.20113
Mixture Volume [cm^3]	1195.00000
MC Volume [cm^3]	8957.00000
MC Area [cm^2]	1.00000
Normalization factor	0.13342
Mixture X_0 [cm]	27.13549
Norm. Mixture X_0 [cm]	203.39125
Norm. Mixture X_0 (%)	4403.82764
Mixture λ_0 [cm]	51.00992
Norm. Mixture λ_0 [cm]	382.33960
Norm. Mixture λ_0 (%)	2342.68164
Total weight (g)	1801.55518

X_0 contribution	
Support:	0.973
Sensitive:	0.000
Cables:	0.027
Cooling:	0.000
Electronics:	0.000

λ_0 contribution	
Support:	0.976
Sensitive:	0.000
Cables:	0.024
Cooling:	0.000
Electronics:	0.000

Volume 2 (Material name: Pix_Fwd_End_Flange)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Aluminium for End Flange	Aluminium	187.0000	73.913	504.9000	73.574	2.700	8.893	67.251	39.407	73.863
2	Aluminium for cooling lines	Aluminium	4.0000	1.581	10.8000	1.574	2.700	8.893	1.439	39.407	1.580
3	SnCu	FPix_Cylind_SnCu	11.0000	4.348	97.4600	14.202	8.860	1.395	25.226	16.034	10.679
4	Poliax	FPix_Cylind_POLIAX	35.0000	13.834	44.4500	6.477	1.270	32.555	3.438	60.962	8.936
5	C6F14	FPix_Cylind_C6F14	16.0000	6.324	28.6400	4.173	1.790	19.340	2.646	50.399	4.941

Mixture density [g/cm^3]	2.71245
Norm. mixture density [g/cm^3]	1.66566
Mixture Volume [cm^3]	253.00000
MC Volume [cm^3]	412.00000
MC Area [cm^2]	1.00000
Normalization factor	0.61408
Mixture X_0 [cm]	8.09109
Norm. Mixture X_0 [cm]	13.17601
Norm. Mixture X_0 (%)	3126.89575
Mixture λ_0 [cm]	39.38050
Norm. Mixture λ_0 [cm]	64.12951
Norm. Mixture λ_0 (%)	642.44995
Total weight (g)	686.25000

X_0 contribution	
Support:	0.673
Sensitive:	0.000
Cables:	0.287
Cooling:	0.041
Electronics:	0.000

λ_0 contribution	
Support:	0.739
Sensitive:	0.000
Cables:	0.196
Cooling:	0.065
Electronics:	0.000

Volume 3 (Material name: Pix_Fwd_End_Electro_1)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	SnCu	FPix_Cylind_SnCu	13.0000	8.844	115.1800	34.432	8.860	1.395	58.399	16.034	23.145
2	G10	FPix_Cylind_G10	65.0000	44.218	110.5000	33.033	1.700	21.875	18.614	46.936	39.533
3	Poliax	FPix_Cylind_POLIAX	39.0000	26.531	49.5300	14.807	1.270	32.555	7.505	60.962	18.262
4	Carbon Fiber	FPix_Cylind_CF	23.0000	15.646	34.3850	10.279	1.495	27.645	5.212	51.236	12.815
5	Copper	Copper	2.0000	1.361	17.9200	5.357	8.960	1.435	8.729	15.056	3.792
6	Polyester	FPix_Cylind_Polyes	5.0000	3.401	7.0000	2.093	1.400	20.317	1.542	58.181	2.453

Mixture density [g/cm^3]	2.27561
Norm. mixture density [g/cm^3]	0.29369
Mixture Volume [cm^3]	147.00000
MC Volume [cm^3]	1139.00000
MC Area [cm^2]	1.00000
Normalization factor	0.12906
Mixture X_0 [cm]	9.20875
Norm. Mixture X_0 [cm]	71.35213
Norm. Mixture X_0 (%)	1596.30823
Mixture λ_0 [cm]	41.96302
Norm. Mixture λ_0 [cm]	325.14206
Norm. Mixture λ_0 (%)	350.30841
Total weight (g)	334.51501

X_0 contribution	
Support:	0.052
Sensitive:	0.000
Cables:	0.861
Cooling:	0.000
Electronics:	0.087

λ_0 contribution	
Support:	0.128
Sensitive:	0.000
Cables:	0.834
Cooling:	0.000
Electronics:	0.038

Volume 4 (Material name: Pix_Fwd_End_Electro_2)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	SnCu	FPix_Cylind_SnCu	11.0000	9.167	97.4600	35.884	8.860	1.395	61.196	16.034	24.063
2	G10	FPix_Cylind_G10	54.0000	45.000	91.8000	33.800	1.700	21.875	19.151	46.936	40.353
3	Poliax	FPix_Cylind_POLIAX	31.0000	25.833	39.3700	14.496	1.270	32.555	7.387	60.962	17.836
4	Carbon Fiber	FPix_Cylind_CF	19.0000	15.833	28.4050	10.459	1.495	27.645	5.332	51.236	13.007
5	Copper	Copper	1.0000	0.833	8.9600	3.299	8.960	1.435	5.405	15.056	2.330
6	Polyester	FPix_Cylind_Polyes	4.0000	3.333	5.6000	2.062	1.400	20.317	1.527	58.181	2.411

Mixture density [g/cm^3]	2.26329
Norm. mixture density [g/cm^3]	0.27714
Mixture Volume [cm^3]	120.00000
MC Volume [cm^3]	980.00000
MC Area [cm^2]	1.00000
Normalization factor	0.12245
Mixture X_0 [cm]	9.30978
Norm. Mixture X_0 [cm]	76.02983
Norm. Mixture X_0 (%)	1288.96765
Mixture λ_0 [cm]	42.08934
Norm. Mixture λ_0 [cm]	343.72961
Norm. Mixture λ_0 (%)	285.10782
Total weight (g)	271.59500

X_0 contribution	
Support:	0.053
Sensitive:	0.000
Cables:	0.893
Cooling:	0.000
Electronics:	0.054

λ_0 contribution	
Support:	0.130
Sensitive:	0.000
Cables:	0.847
Cooling:	0.000
Electronics:	0.023

Volume 5 (Material name: Pix_Fwd_End_Coil_Fiber)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	Polyester	FPix_Cylind_Polyes	225.0000	54.087	315.0000	55.642	1.400	20.317	64.046	58.181	54.402
2	Poliax	FPix_Cylind_POLIAX	122.0000	29.327	154.9400	27.369	1.270	32.555	21.672	60.962	28.152
3	G10	FPix_Cylind_G10	33.0000	7.933	56.1000	9.910	1.700	21.875	8.724	46.936	9.891
4	Noryl	FPix_Cylind_Noryl	26.0000	6.250	28.0800	4.960	1.080	39.096	3.846	69.101	5.293
5	PMMA	FPix_Cylind_PMMA	10.0000	2.404	12.0000	2.120	1.200	33.791	1.711	62.176	2.262

Mixture density [g/cm^3]	1.36087
Norm. mixture density [g/cm^3]	0.19983
Mixture Volume [cm^3]	416.00000
MC Volume [cm^3]	2833.00000
MC Area [cm^2]	1.00000
Normalization factor	0.14684
Mixture X_0 [cm]	24.05797
Norm. Mixture X_0 [cm]	163.83707
Norm. Mixture X_0 (%)	1729.15686
Mixture λ_0 [cm]	58.51994
Norm. Mixture λ_0 [cm]	398.52637
Norm. Mixture λ_0 (%)	710.86890
Total weight (g)	566.12000

X_0 contribution	
Support:	0.126
Sensitive:	0.000
Cables:	0.874
Cooling:	0.000
Electronics:	0.000

λ_0 contribution	
Support:	0.152
Sensitive:	0.000
Cables:	0.848
Cooling:	0.000
Electronics:	0.000

Volume 6 (Material name: Pix_Fwd_Port_Cards)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	G10	FPix_Cylind_G10	103.0000	53.927	175.1000	42.956	1.700	21.875	26.971	46.936	48.943
2	Copper	Copper	11.0000	5.759	98.5600	24.179	8.960	1.435	43.900	15.056	16.294
3	Polyimide (extension cable)	FPix_Kapton	33.0000	17.277	46.2000	11.334	1.400	28.983	6.522	56.623	12.998
4	Port card/ CCU connectors	FPix_Cylind_Polyes	12.0000	6.283	16.8000	4.121	1.400	20.317	3.383	58.181	4.600
5	Solder	FPix_TinLeadSolder	1.0000	0.524	8.8000	2.159	8.800	0.839	6.829	21.380	1.043
6	Resistors	FPix_Alumina	2.0000	1.047	7.9200	1.943	3.960	7.055	1.624	24.329	1.833
7	Capacitors	Barium_Titanate	1.0000	0.524	6.0200	1.477	6.020	1.854	3.090	23.039	0.968
8	Chips	Silicon	1.0000	0.524	2.3300	0.572	2.330	9.365	0.612	45.494	0.490
9	OH parts (mostly G10)	FPix_Cylind_G10	27.0000	14.136	45.9000	11.260	1.700	21.875	7.070	46.936	12.830

Mixture density [g/cm^3]	2.13419
Norm. mixture density [g/cm^3]	1.22780
Mixture Volume [cm^3]	191.00000
MC Volume [cm^3]	332.00000
MC Area [cm^2]	1.00000
Normalization factor	0.57530
Mixture X_0 [cm]	10.94065
Norm. Mixture X_0 [cm]	19.01726
Norm. Mixture X_0 (%)	1745.78247
Mixture λ_0 [cm]	42.59816
Norm. Mixture λ_0 [cm]	74.04496
Norm. Mixture λ_0 (%)	448.37622
Total weight (g)	407.63004

X_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.099
Cooling:	0.000
Electronics:	0.901

λ_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.176
Cooling:	0.000
Electronics:	0.824

Volume 7: FRONT (Material name: Pix_Fwd_End_Pipe_1)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	SnCu	FPix_Cylind_SnCu	74.0000	16.193	655.6400	47.886	8.860	1.395	69.876	16.034	37.339
2	C6F14	FPix_Cylind_C6F14	214.0000	46.827	383.0600	27.978	1.790	19.340	14.571	50.399	34.352
3	Aluminium (cooling tube)	Aluminium	81.0000	17.724	218.7000	15.973	2.700	8.893	11.994	39.407	16.630
4	Poliax	FPix_Cylind_POLIAX	88.0000	19.256	111.7600	8.163	1.270	32.555	3.559	60.962	11.679

Mixture density [g/cm^3]	2.99597
Norm. mixture density [g/cm^3]	2.87036
Mixture Volume [cm^3]	457.00000
MC Volume [cm^3]	477.00000
MC Area [cm^2]	1.00000
Normalization factor	0.95807
Mixture X_0 [cm]	6.01775
Norm. Mixture X_0 [cm]	6.28111
Norm. Mixture X_0 (%)	7594.19531
Mixture λ_0 [cm]	36.97304
Norm. Mixture λ_0 [cm]	38.59112
Norm. Mixture λ_0 (%)	1236.03577
Total weight (g)	1369.16003

X_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.734
Cooling:	0.266
Electronics:	0.000

λ_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.490
Cooling:	0.510
Electronics:	0.000

Volume 8: BACK (Material name: Pix_Fwd_End_Pipe_2)

	Component	Material	Volume [cm^3]	%	Weight [g]	%	Density [g/cm^3]	X_0 [cm]	%	λ_0 [cm]	%
1	SnCu	FPix_Cylind_SnCu	66.0000	16.667	584.7599	48.346	8.860	1.395	69.872	16.034	37.939
2	C6F14	FPix_Cylind_C6F14	170.0000	42.929	304.3000	25.159	1.790	19.340	12.977	50.399	31.089
3	Aluminium (cooling tube)	Aluminium	82.0000	20.707	221.4000	18.305	2.700	8.893	13.613	39.407	19.179
4	Poliax	FPix_Cylind_POLIAX	78.0000	19.697	99.0600	8.190	1.270	32.555	3.537	60.962	11.793

Mixture density [g/cm^3]	3.05434
Norm. mixture density [g/cm^3]	3.05434
Mixture Volume [cm^3]	396.00000
MC Volume [cm^3]	396.00000
MC Area [cm^2]	1.00000
Normalization factor	1.00000
Mixture X_0 [cm]	5.84628
Norm. Mixture X_0 [cm]	5.84628
Norm. Mixture X_0 (%)	6773.53809
Mixture λ_0 [cm]	36.49863
Norm. Mixture λ_0 [cm]	36.49863
Norm. Mixture λ_0 (%)	1084.97205
Total weight (g)	1209.51990

X_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.734
Cooling:	0.266
Electronics:	0.000

λ_0 contribution	
Support:	0.000
Sensitive:	0.000
Cables:	0.497
Cooling:	0.503
Electronics:	0.000