Supporting Information

Ablation response behavior under different heat flux environments for liquid silicone rubber composites

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Table S1 Flow rate and pressure of oxygen and acetylene

Heat Flux (MW/m^2) ±10%	Gas Flow rate (mL/min)		O_2/ C_2H_2	Gas Pressure (MPa)		Flame type	Ablation Distance
	O_2	C_2H_2	Ratio (%)	O_2	C_2H_2		
1	3500	4600	0.76	0.4	0.095	carbonizing	10mm
2	12871	9500	1.35	0.4	0.095	oxidizing	10mm
3	20728	15300	1.35	0.4	0.095		
4	25200	18600	1.35	0.4	0.095		
5	26300	19500	1.35	0.4	0.095		
2'	10350	9500	1.09	0.4	0.095	neutral	10mm
3'	17500	15300	1.14	0.4	0.095		
3*	25200	18600	1.35	0.4	0.095	oxidizing	18mm

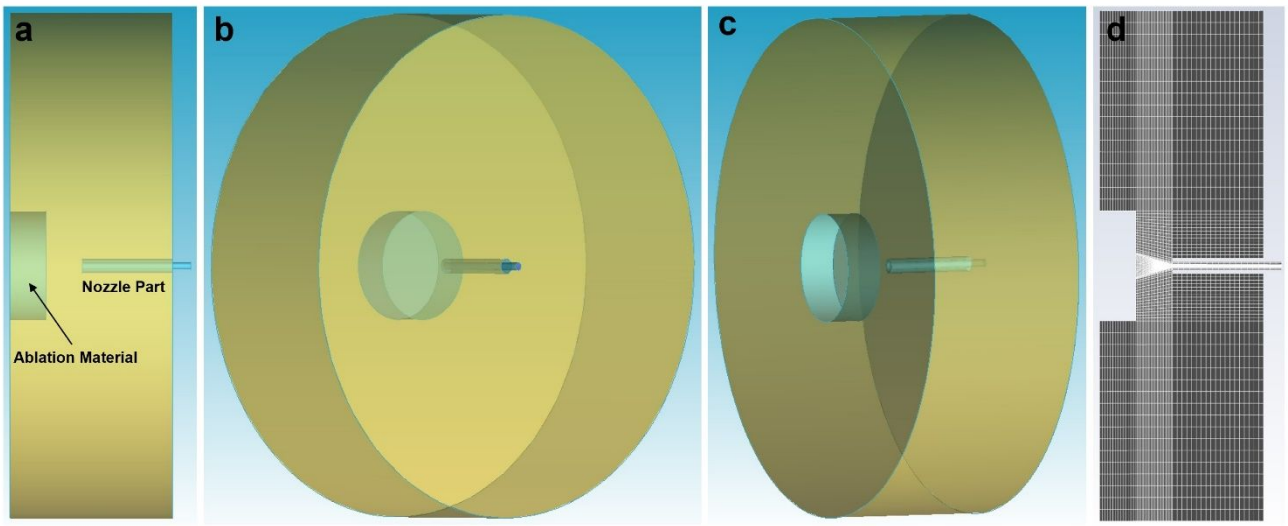
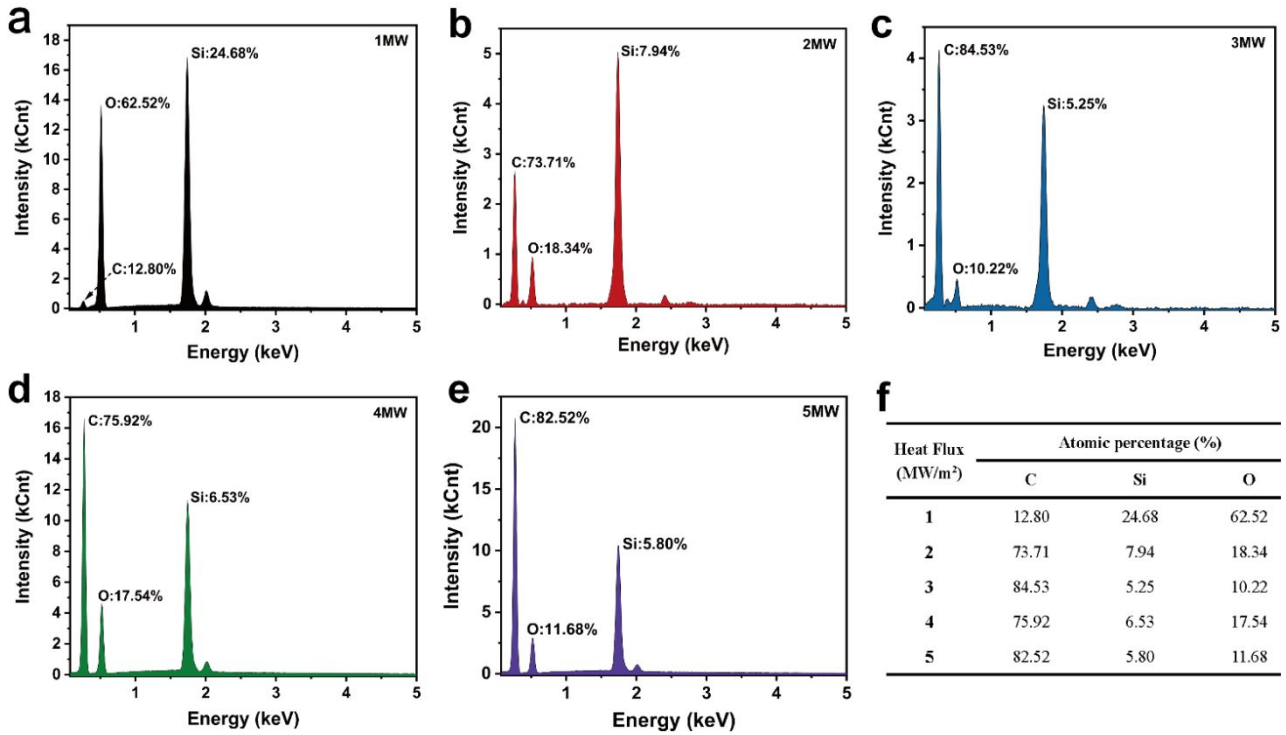


Figure S1. (a-c) Geometric model and (d) mesh structure of the oxy-acetylene test setup.



Heat Flux (MW/m²)	Atomic percentage (%)		
	C	Si	O
1	12.80	24.68	62.52
2	73.71	7.94	18.34
3	84.53	5.25	10.22
4	75.92	6.53	17.54
5	82.52	5.80	11.68

Figure S2. EDS results of char layer surface under different heat fluxes: (a) 1 MW/m^2, (b) 2 MW/m^2, (c) 3 MW/m^2, (d) 4 MW/m^2 and (e) 5 MW/m^2; (f) Atomic percentage of C, Si and O under different heat flux.

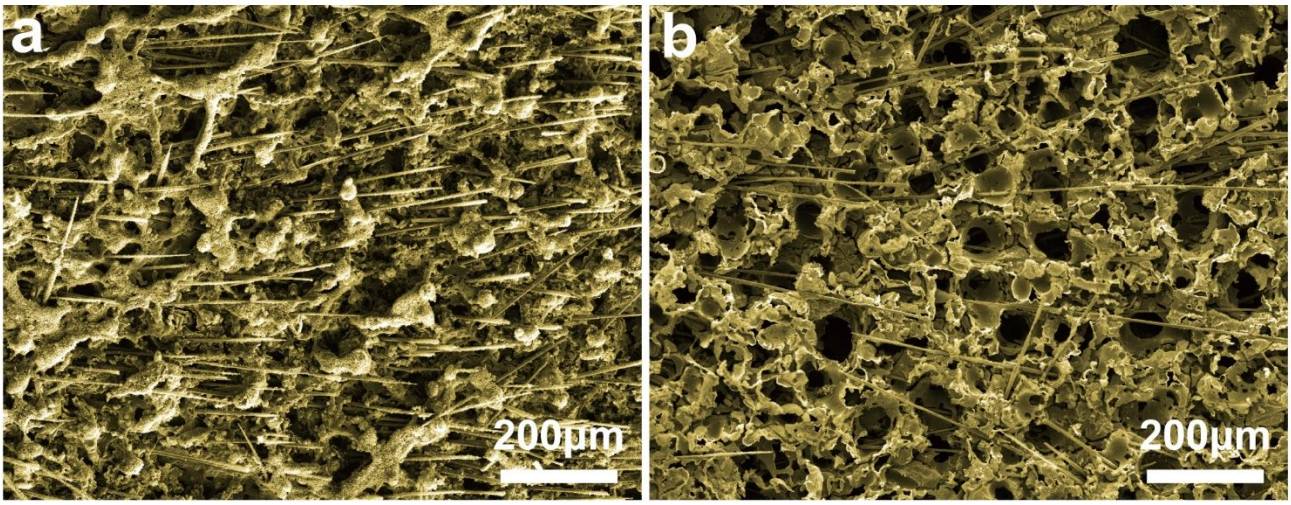


Figure S3. SEM images of the char surface for the ablators after ablation for (a) 10 s, and (b) 30 s.

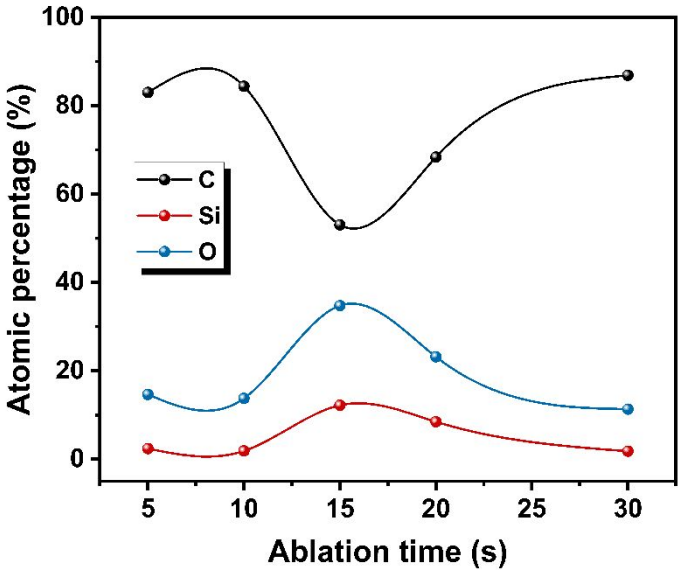


Figure S4. EDS result of the surface for the CFs on the char surface after different exposure times.