Supporting Information

Effect of Yttrium Oxide on Microstructure and Oxidation Behavior of Cr/FeCrAl Coatings Fabricated by Extreme High-Speed Laser Cladding Process: An Experimental Approach

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Figures S1-S5: The EDS mappings of the Y_2O_3-modified coatings before oxidation.

Figure S6: XRD patterns of the FeCrAl powder and the as-polished FeCrAl coating.

Figure S7: Cross-sectional morphology of 2.0 wt.% Y_2O_3 coating after 60 min oxidation.

Table S1: Quantitative results of EDS mappings elements in Figures 9e-13e.

Figures S8-S9: Evolution of surface and cross-sectional morphologies of the Y_2O_3-modified coatings after oxidation.

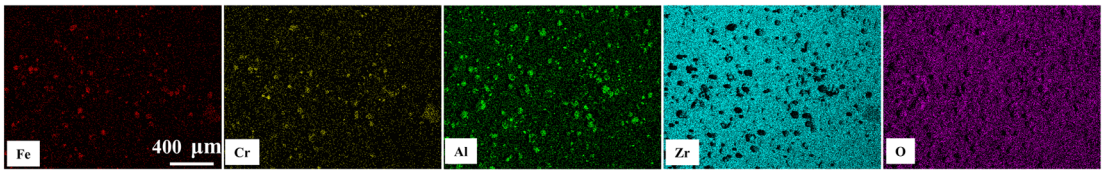


Figure S1. The corresponding EDS mapping to Figure 3a.

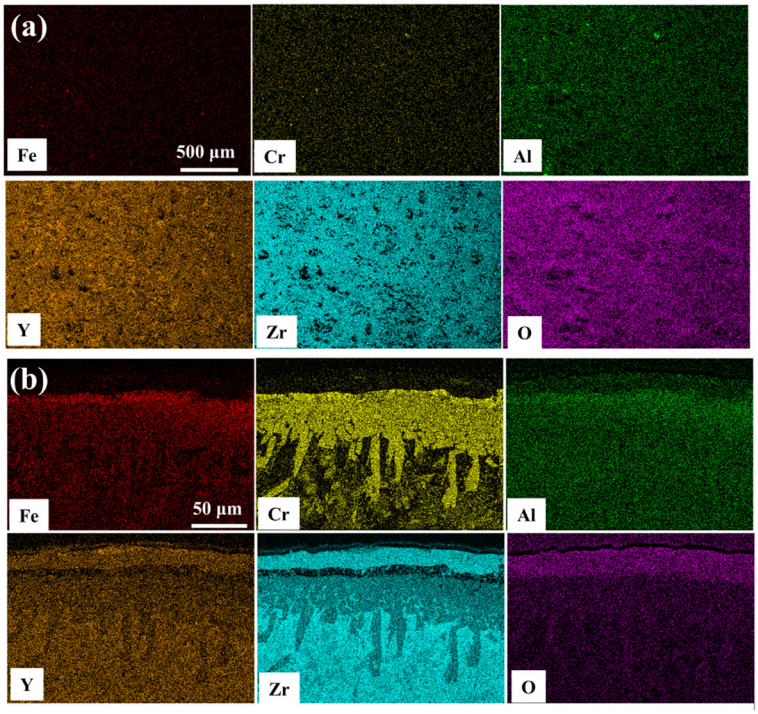


Figure S2. EDS mappings of 0.5 wt.% Y_2O_3 coating: (a) surface; (b) cross-section.

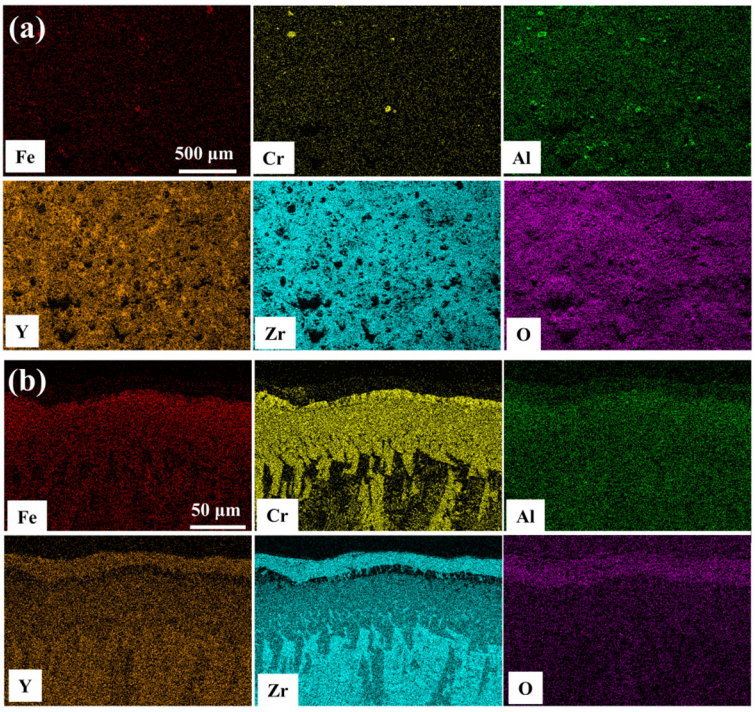


Figure S3. EDS mappings of 1.0 wt.% Y_2O_3 coating: (a) surface; (b) cross-section.

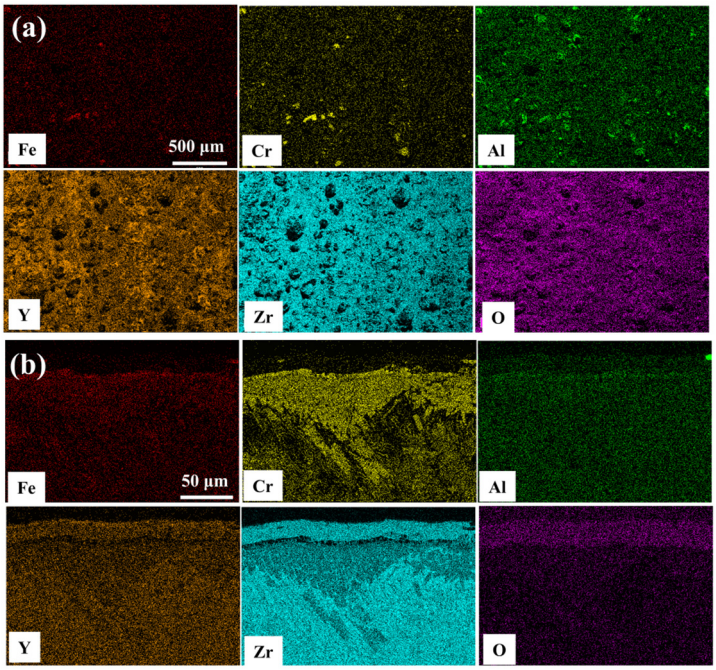


Figure S4. EDS mappings of 2.0 wt.% Y_2O_3 coating: (a) surface; (b) cross-section.

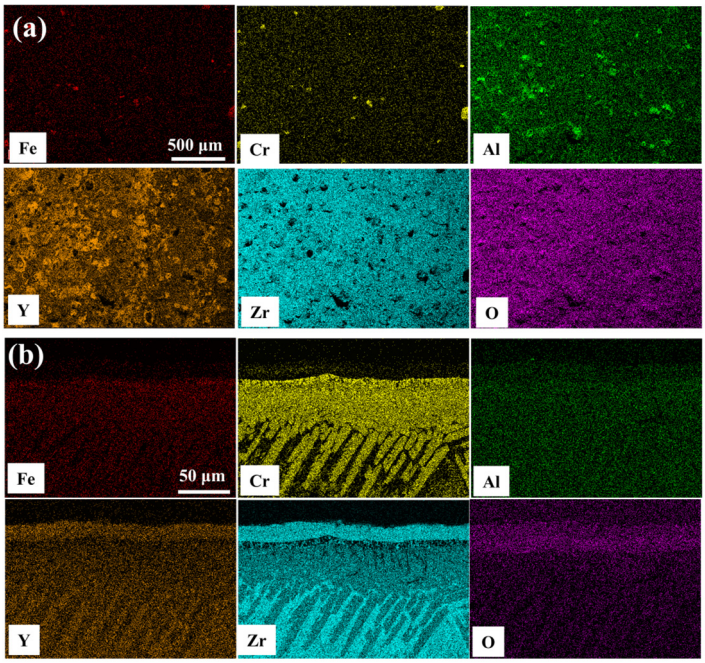


Figure S5. EDS mappings of 5.0 wt.% Y_2O_3 coating: (a) surface; (b) cross-section.

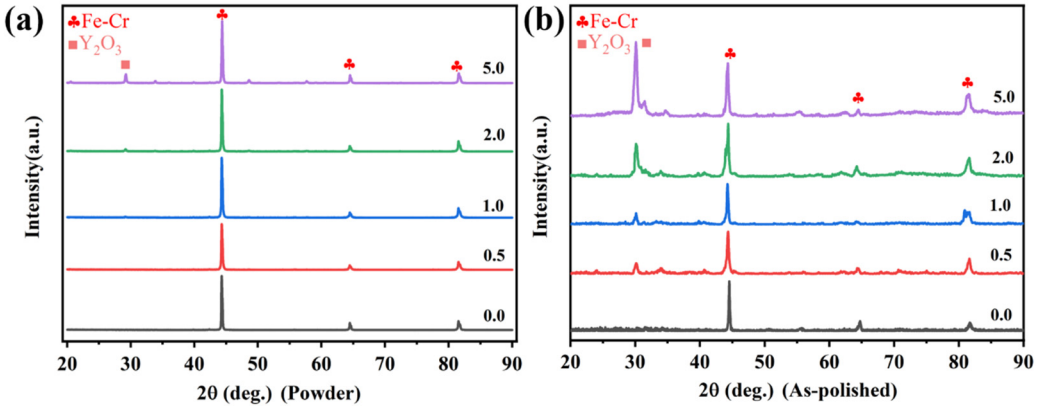


Figure S6. XRD patterns of the FeCrAl powder and the as-polished FeCrAl coating.

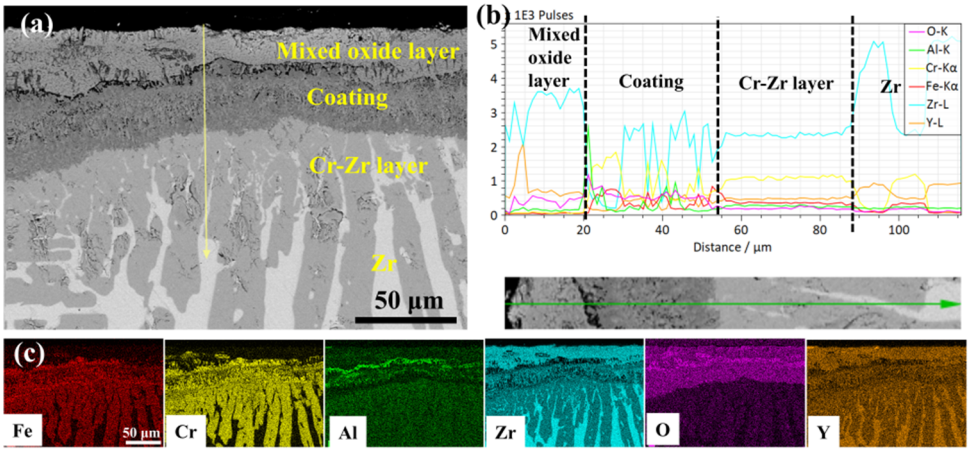


Figure S7. Cross-sectional morphology of 2.0 wt.% Y_2O_3 coating after 60 min oxidation: (a) SEM image; (b, c) EDS scanning and mapping.

Table S1 Quantitative results of EDS mapping elements in Figures 9e-13e.

Sample (wt.%)	Fe	Cr	Al	Y	Zr	O
0.0	13.75	49.73	0.27	-	0.44	35.82
0.5	4.43	55.20	1.43	-	1.46	37.47
1.0	6.38	24.98	28.88	0.01	5.65	34.10
2.0	0.36	0.31	45.38	-	7.13	48.62
5.0	1.36	1.56	46.42	0.09	1.30	49.26

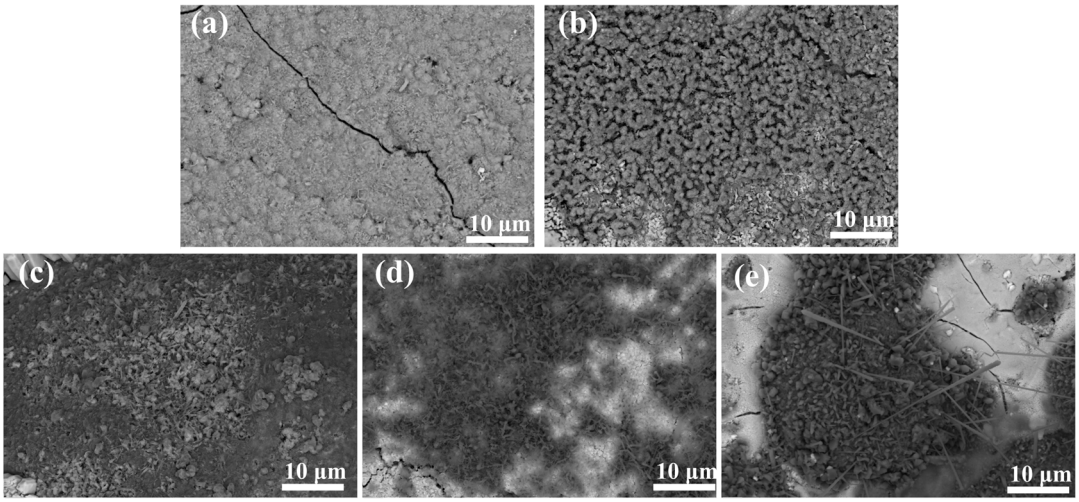


Figure S8. Evolution of surface morphologies of the Y_2O_3-modified coatings after 60 min oxidation: (a) 0.0 wt.%; (b) 0.5 wt.%; (c) 1.0 wt.%; (d) 2.0 wt.%; (e) 5.0 wt.%.

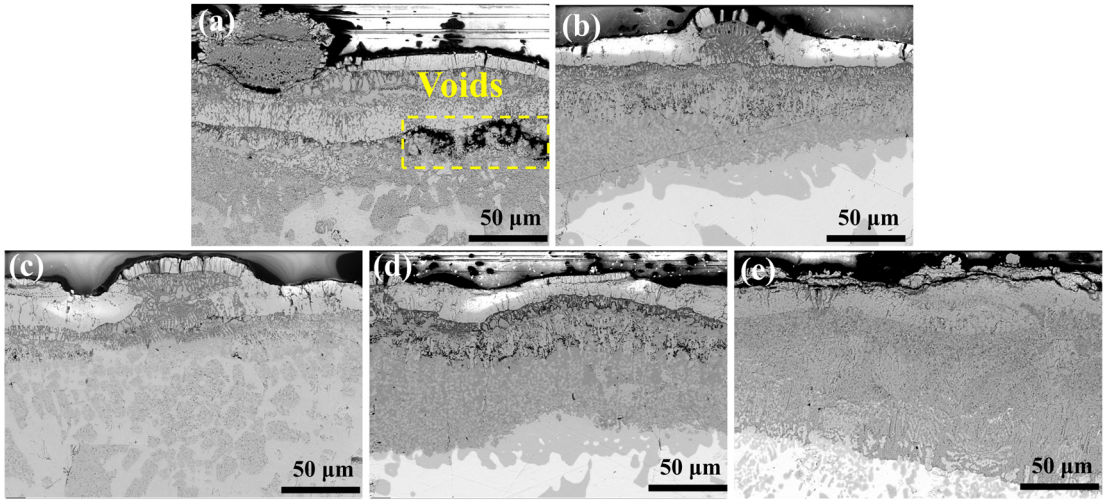


Figure S9. Evolution of cross-sectional morphologies of the Y_2O_3-modified coatings after 120 min oxidation: (a) 0.0 wt.%; (b) 0.5 wt.%; (c) 1.0 wt.%; (d) 2.0 wt.%; (e) 5.0 wt.%.