

Supplementary information

Hierarchically heterogeneous microstructure and mechanical behavior of the multi-materials prepared by powder severe plastic deformation

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Supplementary figures

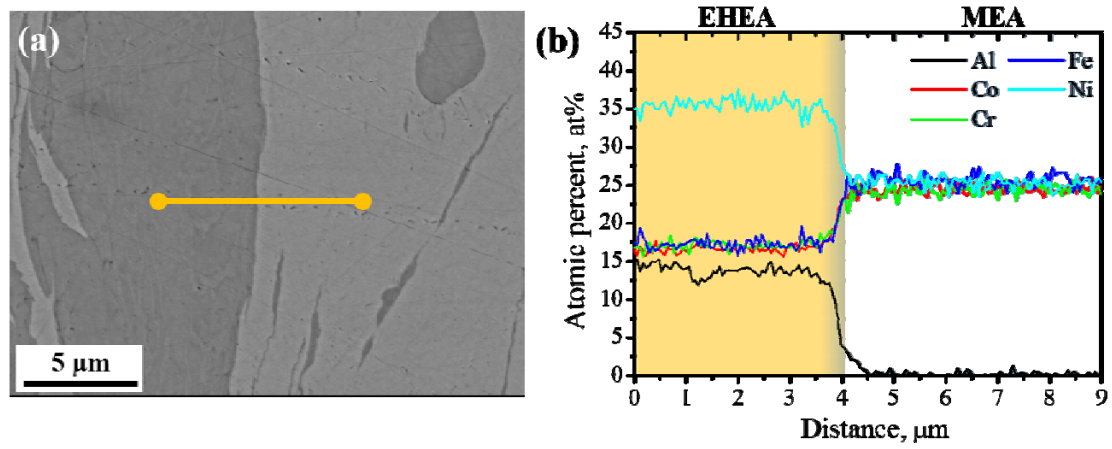


Figure S1. (a) SEM-BSE image of as-HPT sample and (b) EDS line profiles along the yellow line indicated in Fig. S1(a).

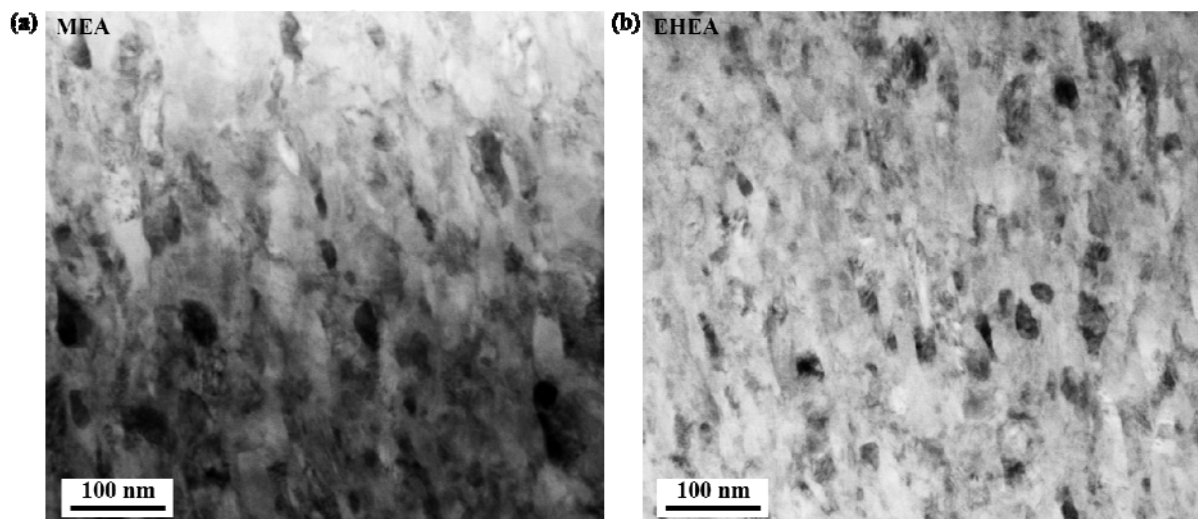


Figure S2. Bright field TEM micrographs of the (a) MEA and (b) EHEA samples.

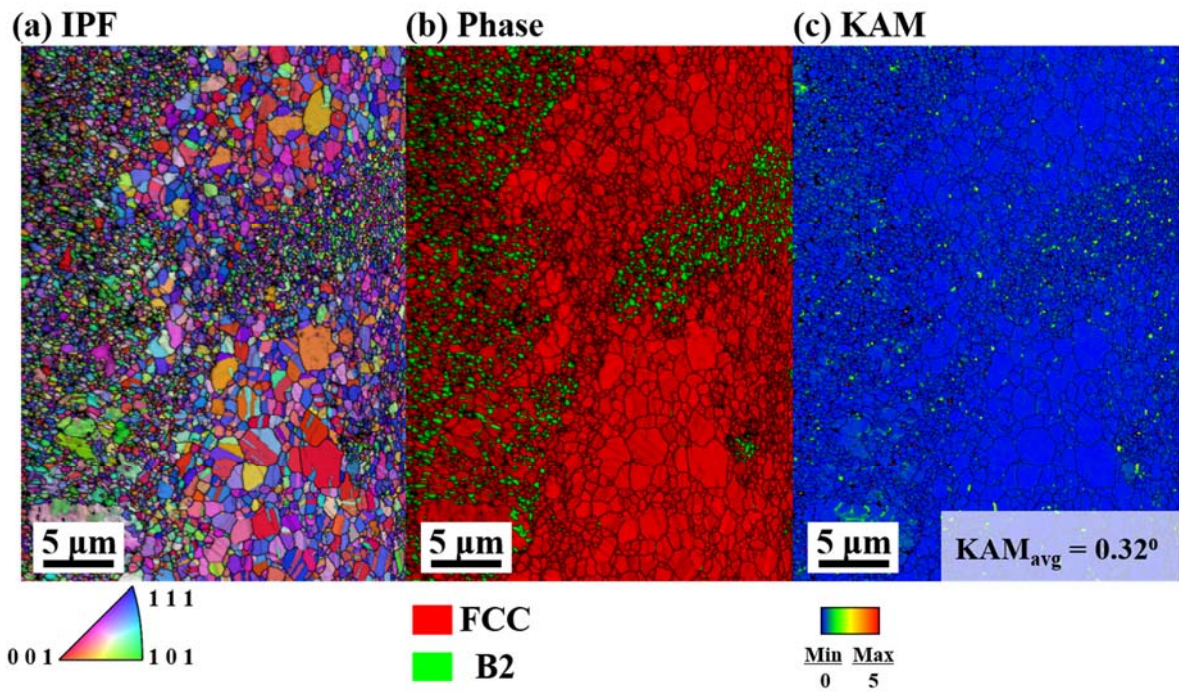


Figure S3. (a) EBSD-IPF, (b) Phase, and (c) KAM maps of the A715 sample.

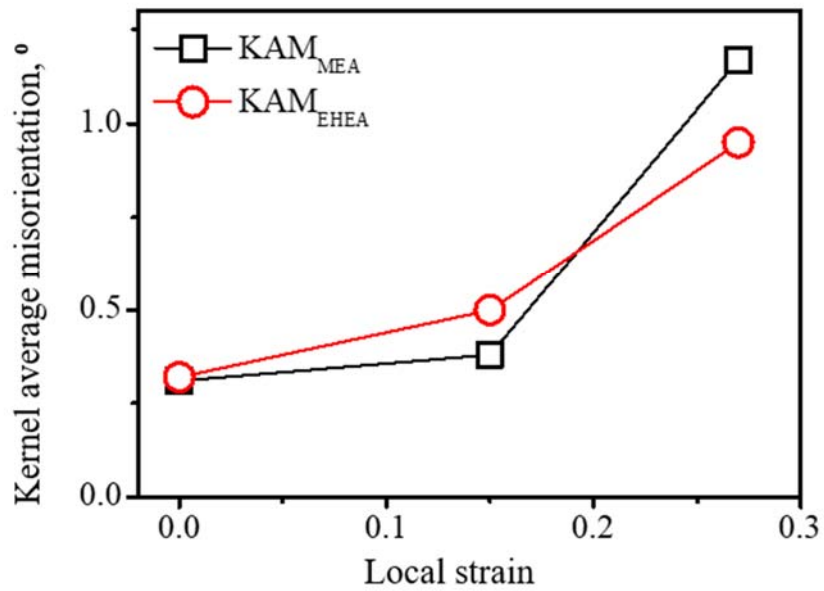


Figure S4. Evolution of average KAM values at different local strains in the deformed A860 sample.

Supplementary table

Table S1. Compositions of the EHEA and MEA domains in the as-HPT, A715, and A860 samples.

at%	EHEA					MEA				
	Al	Co	Cr	Fe	Ni	Al	Co	Cr	Fe	Ni
As-HPT	~13.4	~17.2	~16.4	~17.1	~35.8	~0.2	~25.5	~24.3	~24.6	~25.4
A715	~13.3	~17.8	~16.4	~17.3	~35.3	~3.3	~22.1	~23.0	~22.1	~29.6
A860	~13.4	~17.8	~15.2	~17.0	~36.7	~3.7	~23.0	~22.5	~22.6	~28.3

Table S2. Flow stress, HDI stress, effective stress, and the ratio of HDI stress to flow stress at the corresponding true strains.

True strain	Flow stress, MPa	HDI stress, MPa	Effective stress, MPa	Ratio of HDI stress to flow stress
0.016	1160.8	636.9	523.9	0.55
0.034	1175.4	712.5	462.9	0.61
0.054	1240.2	739.5	500.7	0.60
0.074	1278.1	759.9	518.2	0.59
0.096	1288.7	802.3	486.4	0.62