

Supplementary Table 1. Results of Kolmogorov-Smirnov tests of normal distribution for the Stage II and Stage III preforms and Stage VII finished beads from HOR-1.

Kolmogorov-Smirnov Test Results						
	Stage II		Stage III		Stage VII	
	Statistic (D)	Sig. (p)	Statistic (D)	Sig. (p)	Statistic (D)	Sig. (p)
Area	.17831	.62627	.13925	.38464	.16067	.4654
Max. Width	.24493	.24857	.08967	.87587	.10472	.90978
Max. Height	.20842	.43196	.09838	.79774	.08989	.9722
Shape Index	.14201	.85992	.17231	.1653	.11357	.8536
Ellipsoid Homogeneity	.17653	.63839	.11846	.58735	.20226	.20762
Circular Homogeneity	.11755	.961	.16012	.23083	.16321	.4458

Supplementary Table 2. Results of Levene's Test for homogeneity of variance for the Stage II and Stage III preforms (top), and for Stage III and Stage VII) bottom at HOR-1. * indicates that the assumption of homogeneity of variance is violated.

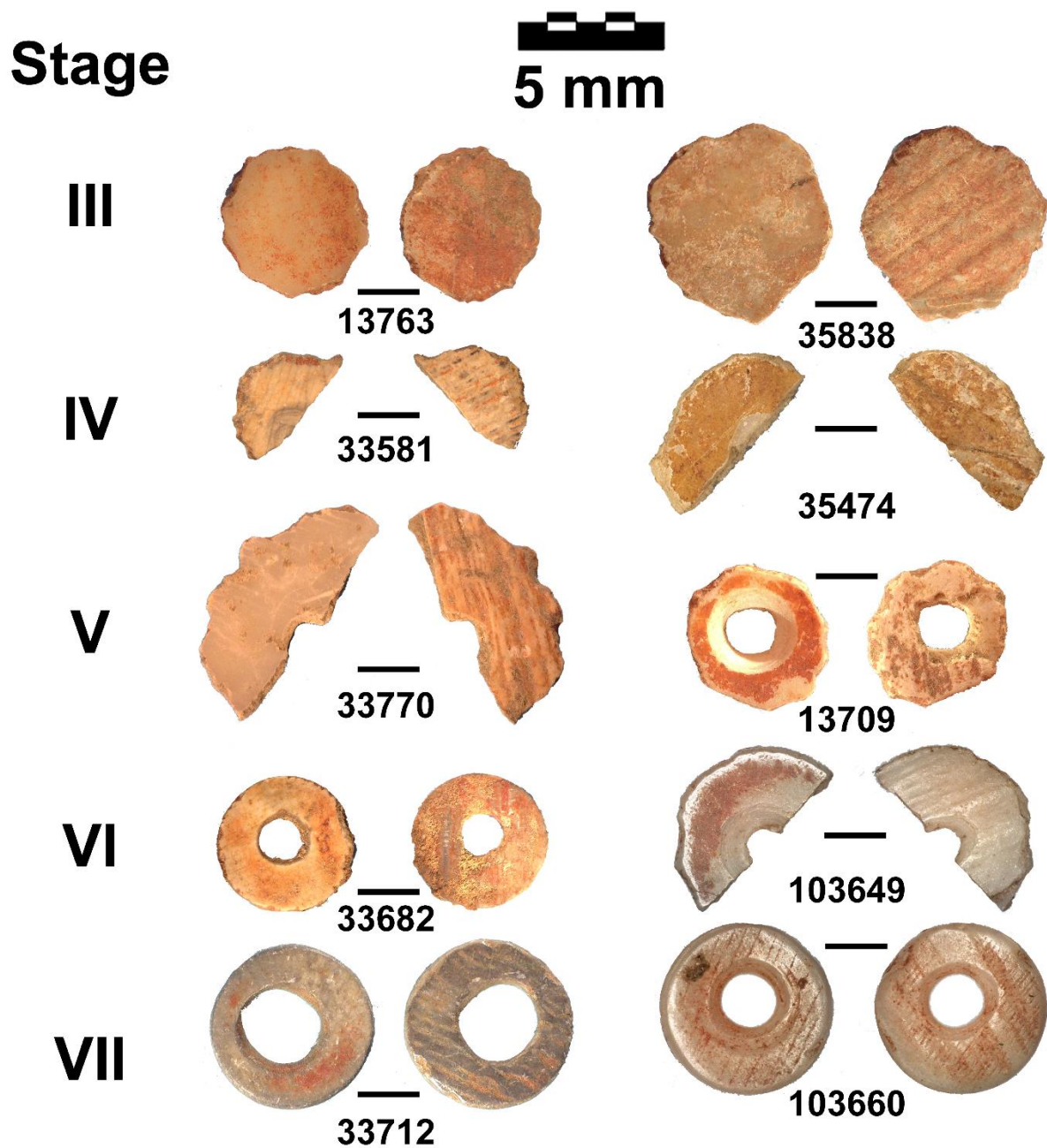
Levene's Test Results: Stage II and Stage III				
	Statistic (F)	df1	df2	Sig. (p)
Area	3.98729	1	54	.050896
Max. Width	1.816	1	54	.183417
Max. Height	3.46832	1	54	.067999
Shape Index	0.66746	1	54	.41753
Ellipsoid Homogeneity	0.41945	1	54	.519954
Circular Homogeneity	0.7222	1	54	.789151
Levene's Test Results: Stage III and Stage VII				
	Statistic (F)	df1	df2	Sig. (p)
Area	3.58494	1	64	.062828
Max. Width	2.12647	1	64	.149664
Max. Height	1.23854	1	64	.269915
Shape Index	6.29526	1	64	.014649*
Ellipsoid Homogeneity	13.88011	1	64	.000414*
Circular Homogeneity	9.78176	1	64	.002652*

Supplementary Table 3: Dunn's post hoc test on the samples in Figure 9a (raw p-values, uncorrected significance). Significant results are in bold.

	None	Trace	Substantial	Washed
None		0.0065	<0.0001	<0.0001
Trace			<0.0001	<0.0001
Substantial				0.4463
Washed				

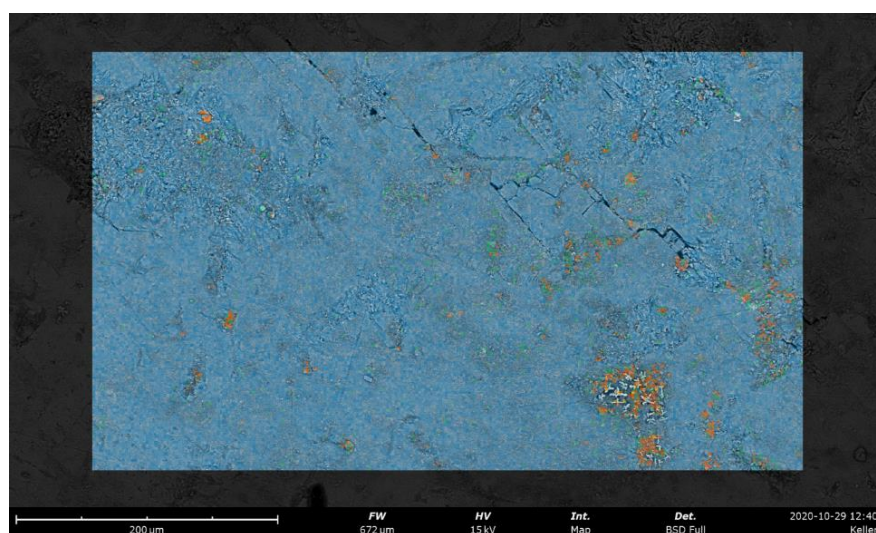
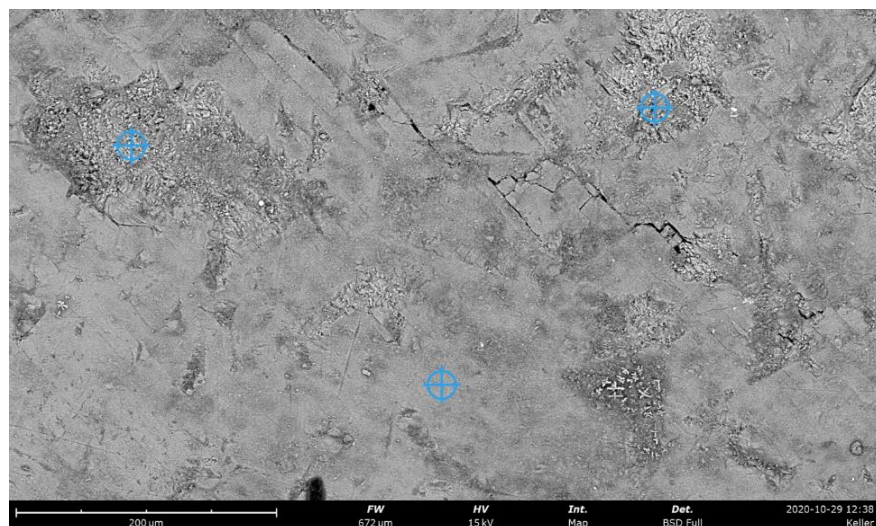
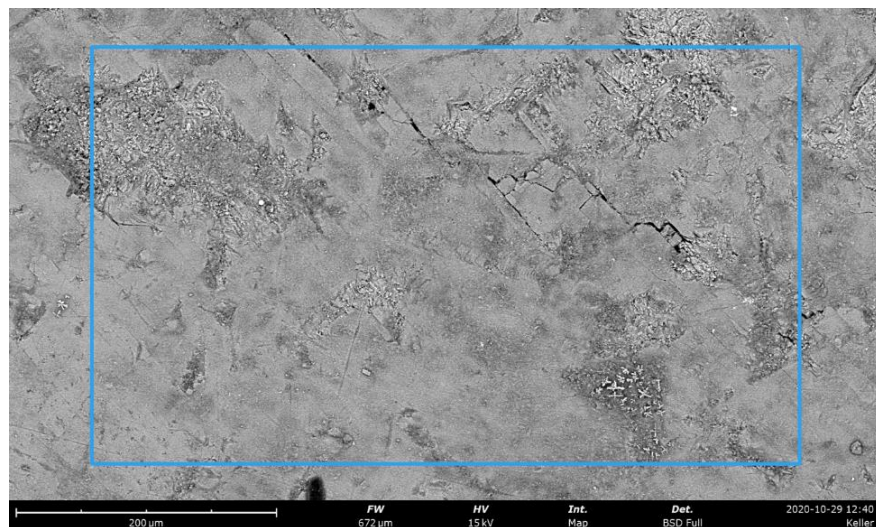
Supplementary Table 4: Dunn's post hoc test on the samples shown in Figure 9d (raw P-values, uncorrected significance). Significant results are in bold.

	Map (No matrix/ residue)	Map (substantial residues)	Map (substantial matrix)	Spot (substantial residue)	Spot (substantial matrix)
Map (No matrix/ residue)		0.0004	0.2359	<0.0001	0.0203
Map (substantial residues)			0.0193	0.288	0.2433
Map (substantial matrix)				0.0008	0.256
Spot (substantial residue)					0.0283
Spot (substantial matrix)					

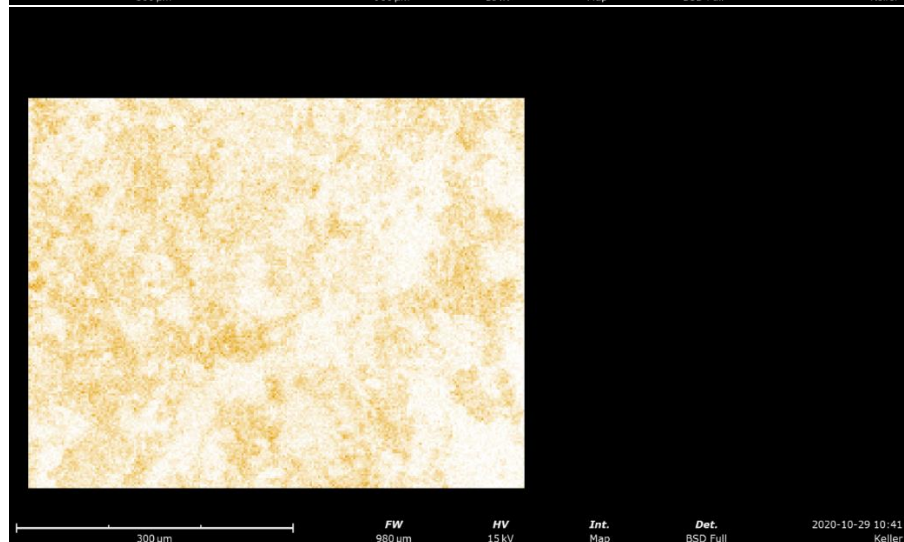
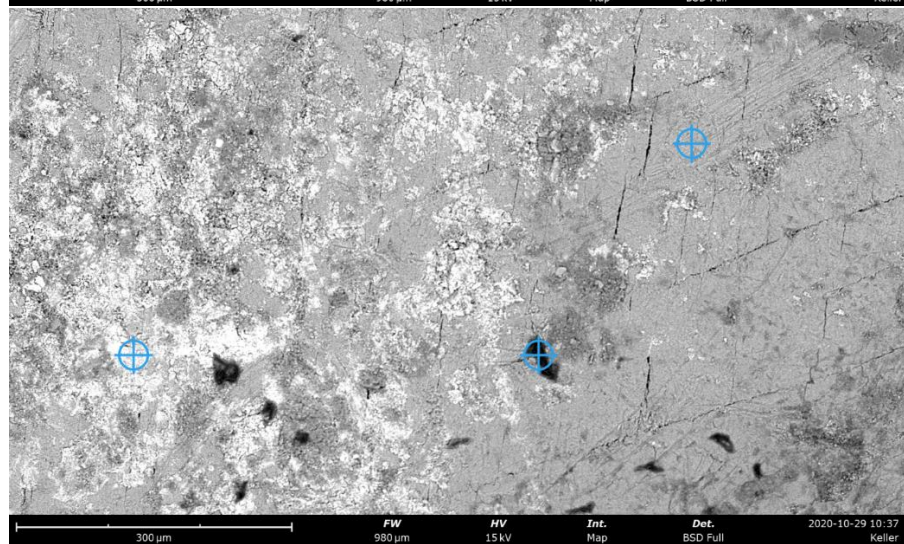
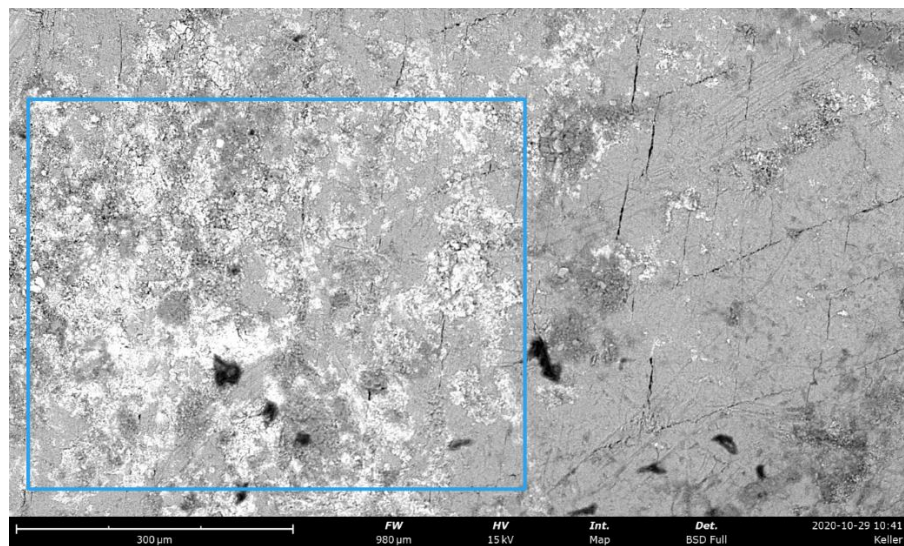


Supplementary Figure 1. Examples of red residues at each of the identifiable production stages. All specimens are from HOR-1.

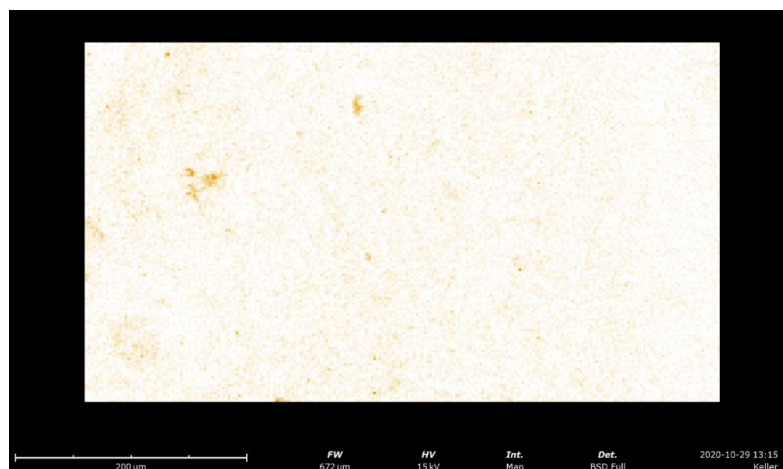
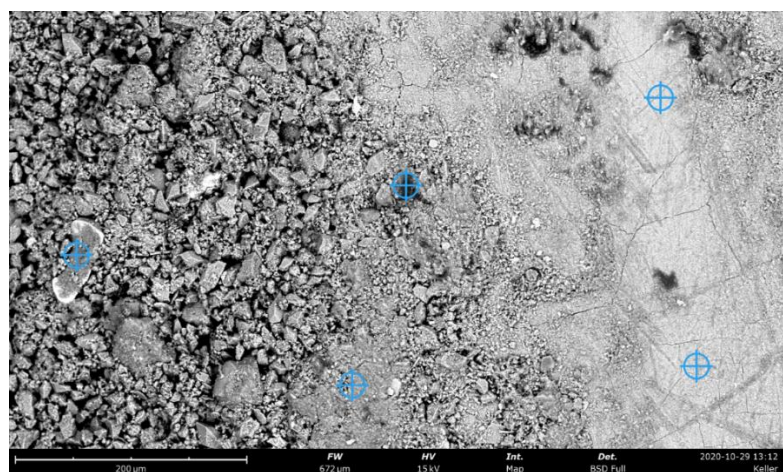
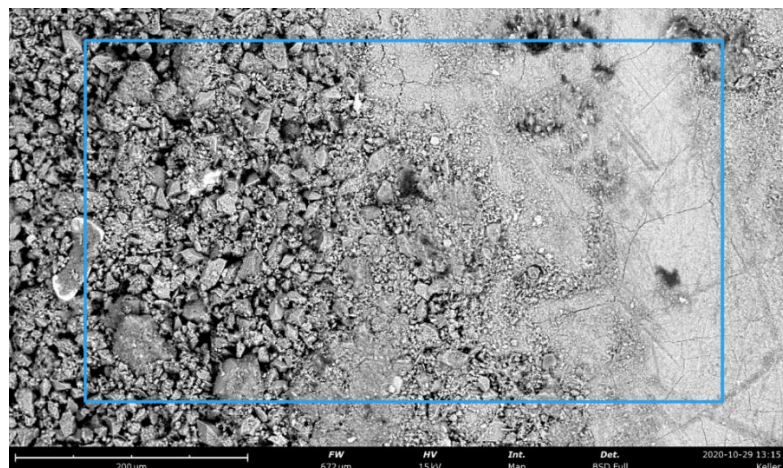
33749, nothing on surface. Boxed area is in the elemental map at base (orange is not Fe here, but shows homogeneity of element distributions). Targeted reading locations shown with blue crosshairs.



33712, substantial residues. White areas are the red residues. Boxed area is in the elemental map at base, with Fe showing as orange. Targeted reading locations shown with blue crosshairs.



33745, substantial matrix. White areas are the red residues. Boxed area is in the elemental map at base, with Fe showing as orange. Targeted reading locations shown with blue crosshairs.



Supplementary Figure 2. Examples of SEM mapped scan areas (top of each set), targeted scans (middle of each set), and mapped scans showing elements (bottom of each set) for a specimen (33749) with no residue or matrix, a specimen (33745) with substantial residue but no matrix, and a specimen (33745) with substantial matrix but no residue.