

CONFIDENTIAL REPORT TO THE DIRECTOR  
NATIONAL BUREAU OF STANDARDS

TABLE I  
Conditions and results for uranium extruded high in the alpha phase  
Group 1. Structures that appear to have transformed from the beta phase (beta structure)

No.	Composi- tion <sup>(1)</sup>	Billet temp. (°C)	Reduction ratio	Ram speed (in/min)	Strain rate (sec <sup>-1</sup> )	Con- tainer temp. (°C)	Extru- sion constant K (tsi)	Quench <sup>(2)</sup> distance (in)	Grain size (μm)		GI <sub>long</sub> .				
									Core	Rim	1	2	3	4	avg.
1	U	650	40	110	73	500	18	1	200	100	+2.3	+2.5			+2.4
2	U	650	40	110	73	260	19	10	500	500	+0.3	-0.2	+0.2	-0.2	0
3	U	650	25	110	46	500	20	1	750	750	+1.1	-1.8			-0.3
4	A	650	25	110	46	500	24	1	50	50	-0.1				
5	A	650	25	110	46	500	24	1	50	50					
6	U	650	40	55	37	500	25	1	400	400	+1.8	+1.6			+1.7
7	U	650	25	55	23	500	20	1	250	250	+1.8	+0.9			+1.4
8	U	650	40	20	13	260	17	10	1000	500	+4.5	+3.5			+4.0 <sup>(3)</sup>
9	U	593	40	110	73	500	19	1	1000	1000	-1.3	-1.9			-1.6 <sup>(4)</sup>
10	U	593	40	110	73	500	18	10	500	500	-0.3	-1.7			-1.0
11	U	650	40	130	86	500	19	air cool	> 1000	> 1000					
12	U	650	40	110	73	500	21	air cool	> 1000	> 1000					

Group 2. Structures that appear to have been alpha worked and recrystallized (alpha structure)

13	U	650	10	20	3.3	260	14	10	20	20	-5.4				-5.4
14	U	593	10	110	18	500	15	10	15	15	-5.2				-5.2
15	U	593	10	20	3.3	500	13	10	20	20	-3.9				-3.9

Group 3. Structures with "alpha" cores and "beta" rims

16	U	650	10	110	18	260	17	10							
17	U	650	10	55	9.2	500	16	1	250	20	+0.4	0			+0.2
	Core										+0.4				+0.4
	Rim								500	20	+0.3	+0.5			+0.4
18	U	650	10	55	9.2	500	14	1		20	-0.5	-1.4			-1.0
	Core														
	Rim								500	20	+0.7	-0.1			+0.3
19	A	650	10	110	18	500		1		20	-3.0				-3.0
	Core														
	Rim														
20	U <sup>(5)</sup>	650	10	55	9.2	250		1							
	Core														
	Rim								500	20	+0.1				
21	U <sup>(5)</sup>	650	10	55	9.2	250		1							
	Core														
	Rim								500						
22	U	593	40	20	13	500	15	10		20	-1.6				
	Core									25	-3.4				-3.4

Group 4. Rattlesnaked extrusions

23	U	675	40	110	73	500									
24	A	650	40	110	73	500									

<sup>(1)</sup> U=unalloyed uranium; A=uranium-0.16 wt % silicon alloy.  
<sup>(2)</sup> Distance from die to quenching head.  
<sup>(3)</sup> The large grain size of this rod makes the X-ray texture results unreliable. The relative pole intensities varied widely between runs.  
<sup>(4)</sup> Although the grain size is very large, the relative pole intensities do not vary much between runs. This average may be reliable.