

BASIC URANIUM-233 CRITICAL PARAMETERS

These basic values are taken from references which would normally be used as bases for standards. ARH-600 values compare favorably.

<u>METAL</u> (1) (2)	<u>Full Reflection*</u>	<u>Bare**</u>
Minimum critical spherical mass, Kgs ^{233}U 18.66 g/cm ³	7.6	17.0
Infinite cylinder diameter, inches, ^{233}U 18.66 g/cm ³	2.01	3.2
Infinite slab thickness, inches, ^{233}U 18.66 g/cm ³	0.247	1.8
Minimum spherical volume, liters, ^{233}U 18.66 g/cm ³	.407	.84
<u>HOMOGENEOUS SOLUTIONS</u> (2) (3)		
Minimum critical mass, g ^{233}U	570	1200
Infinite cylinder diameter, inches	4.68	7.5
Infinite slab thickness, inches	1.26	4.0
Minimum spherical volume, liters	3.7	8.7
Minimum areal concentration g/ft ²	341	~440
Minimum critical aqueous concentration, g/l ^{233}U	11.25 ± 0.10 (2) 11.2 (3)	

* Reflector is water unless otherwise specified.

** "Bare" solutions have 1/16-inch stainless steel reflector

- (1) W. H. Roach and D. R. Smith. "Estimates of Maximum Subcritical Dimensions of Single Fissile Metal Units", ORNL-CDC-3, October, 1967, (reflected metal systems).
- (2) H. C. Paxton, et al. "Critical Dimensions of Systems Containing ^{235}U , ^{239}Pu and ^{233}U ", TID-7028, June, 1964, (for all bare systems unless otherwise noted; solutions are U(100)-H₂O with correction for H/U relationships for actual solutions).
- (3) J. W. Webster. "Calculated Neutron Multiplication Factors of Uniform Aqueous Solutions of ^{233}U and ^{235}U ", ORNL-CDC-2, October, 1967, (for reflected U(100)O₂F₂ systems).