American Nuclear Society

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use of borosilicate-glass raschig rings as a neutron absorber in solutions of fissile material

an American National Standard

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American National Standard
Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material

Secretariat
American Nuclear Society

Prepared by the
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American National Standard

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Foreword

(This Foreword is not a part of American National Standard Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material, ANSI/ANS-8.5-1986.)

This standard, which provides guidance for the use of borosilicate-glass raschig rings as a neutron absorber for criticality control in plants processing fissile materials, was first approved as N16.4-1971, revised as ANSI/ANS-8.5-1979, and this revision results from the prescribed five-year review. It recommends maximum concentrations of homogeneous solutions of uranium and plutonium in vessels of unlimited size when packed with rings. Although the general use of neutron absorbers, including raschig rings, for this purpose dates back to 1958, some applications were recorded as early as the mid-1940s.

In this standard the concentration of solutions is expressed as the mass of plutonium or of uranium per unit volume. Limitations on the relative abundance of the various isotopes of plutonium are imposed in the specifications applicable to plutonium solutions. The limits on total uranium concentration, which are based on 100% ^{235}U, apply to uranium of any ^{235}U content. The ^{233}U content of solutions in which ^{235}U is the principal uranium isotope is limited.

The experimental data forming the bases for the specifications and a review of experience with raschig rings were reported by Nichols et al.[1] at the time of initial preparation of this standard. Additional data that provides bases for this revision have also been published.[2, 3]

This document was approved as an American National Standard in 1971. The present revision, which provides clarification of several items requested by users of the standard and more clearly identifies supporting documentation, was coordinated by N. Ketzlach of the U.S. Nuclear Regulatory Commission assisted by B. Ernst of American Nuclear Insurers, J. D. McCarthy of Rockwell International, Rocky Flats Plant, P. B. Adams of Corning Glass Company, and Martyn C. Evans of British Nuclear Fuels, plc.

The development of the standard and its maintenance were performed under Subcommittee 8 of the Standards Committee of the American Nuclear Society. At the time of this approval of the revision, Subcommittee 8, Fissionable Materials Outside Reactors, had the following membership:

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[1]J. P. Nichols, C. L. Schuske, and D. W. Magnuson, "Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material," Y-CDC-8, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (1971).
[2]P. B. Adams, Chapter 14 in *Ultrapurity*, M. Zief and R. Speights Editors, Marcel Dekker, Inc., New York (1972).
[3]N. Ketzlach, *Nucl. Tech., 42*, 65 (1979).

The American National Standards Committee N16, Nuclear Criticality Safety, which reviewed and approved this standard in 1985, had the following membership:

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E. B. Johnson, Secretary

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