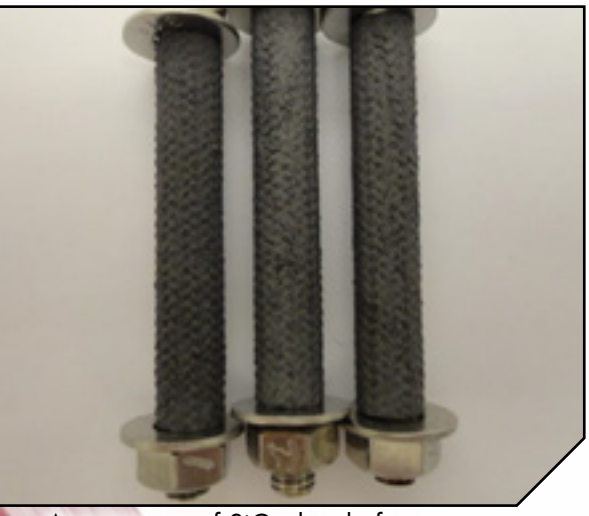
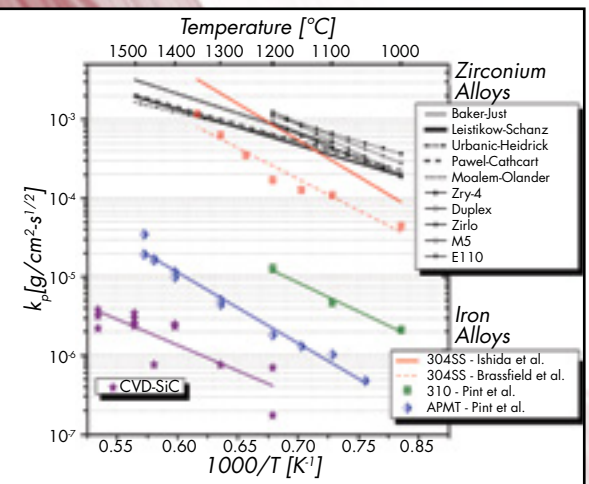


Appearance of SiC tubes before test.
E. Lahoda, et al., Top Fuel 2016



Parabolic rate constant of several alloys in 100% superheated steam. K. Terrani, et al., J Nuclear Materials

"Accident tolerant fuels are a game changer "
— Scot A. Greenlee, Senior VP Exelon

For more information, please contact:

Call Toll Free
877-474-7693
877-4SI-POWER

Visit our website at:
www.structint.com

Email: ***info@structint.com***

Connect with us on social media

Structural Integrity Associates, Inc.®

Accident Tolerant Fuel Design Evaluations

Severe accidents that lead to loss of core cooling may result in fuel rod failures, core damage, and radioactive releases.

Once fully developed, installation of accident tolerant fuel (ATF) will increase the coping time for post-accident core cooling by: reducing hydrogen generation rate, increasing fission product retention, and reducing clad-steam reaction as well as maintain or improve fuel performance in normal operation and transient conditions.

Several ATF Concepts under Development:

Leading candidate ATF concepts:

- Fuel, Uranium Silicide (U_3Si_2) and Chromia doped UO_2
- Cladding, Iron-Chromium-Aluminum (FeCrAl), SiC/SiC Composite, and Chromium coated Zirconium alloy

Other candidate ATF concepts:

- Uranium Nitride (UN), SiC whiskers or Diamond doped UO_2 and MAX Phase (Ti_2AlC) coated Zirconium alloy

The use of ATFs are widely considered to increase fuel safety margins during both steady state and transient conditions as a result of improved material properties, e.g., fuel thermal conductivity & fuel fracture and fragmentation.

Before ATF can be put to use, critical evaluations must be completed. Structural Integrity's Nuclear Fuel Technology experts have contributed to the development and performance evaluation of many ATF concepts:

- Silicon Carbide cladding evaluation using EPRI FALCON code
- Titanium-zirconium-molybdenum composite alloy cladding evaluations
- New ATF concepts and applications study using USDOE BISON code

As the foremost leader in fuel performance analysis support, we are well-positioned and prepared to take fuel design to the next level of safety and reliability. We are currently involved in:
Advanced finite element modeling of new fuel materials under both steady state and transient conditions, accident scenarios such as RIA and LOCA, at the core ATF R&D level with national lab and university partners, and developing in-house computational capability on evaluating ATF performance in LWRs.

ATF is coming to the industry. Be prepared with our support:
R&D of ATF concepts | Use of lead test assemblies in fleet
Planning, implementation, and evaluation of ATF performance in your core