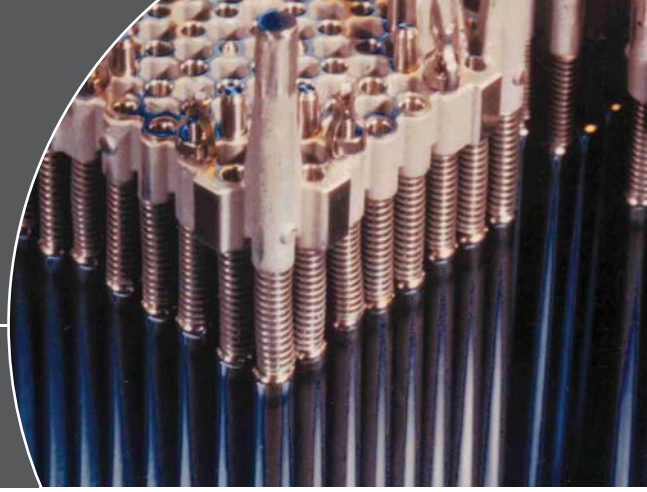
Studsvik

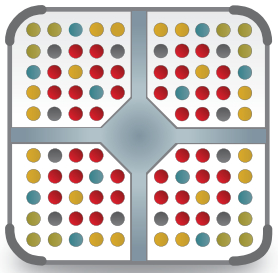
CASMO5

NUCLEAR FUEL ANALYSIS SOFTWARE



Advanced Lattice Physics Code for Light Water Reactors

CASMO5 is Studsvik's state-of-the-art lattice physics code for modeling all types of commercially available nuclear fuel. By including the latest nuclear data and expanded modeling capability, CASMO5 reaches far beyond previously available lattice physics codes.

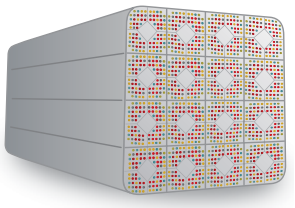


Fuel Lattice Design to Full Core Model

CASMO5 continues Studsvik's long tradition of producing flexible, highly accurate, licensing grade software solutions for the nuclear industry.

CASMO5 has the flexibility to model:

- All commercially available fuel designs
- High mixed-oxide (MOX) concentrations
- High burnable poison concentrations
- Unique traits of AP1000, APWR, EPR, ABWR, ESBWR, SMRs
- Single lattice to multi-assembly effects
- Small reactor critical configurations
- Fuel storage pool/rack configurations and criticality analysis
- Reference calculations (when no measured data is available)
- Higher order Pn-scattering



CASMO5 - SIMULATE5

CASMO5 was developed to provide the required cross-section data for the expanded capabilities of SIMULATE5, Studsvik's steady-state reactor analysis code. Together, they make the most advanced light water reactor physics analysis system in the world.

Methodology

CASMO5 represents the culmination of Studsvik's 30 years of experience in transport-based lattice physics. The 2D transport solution is based on the well-established Method of Characteristics with a linear source approximation, delivering unparalleled fidelity with production-level run times, even with today's more heterogeneous fuel designs.

Improved Modeling Detail

Exploiting the power of today's computational hardware, CASMO5 requires fewer approximations and performs more rigorous solutions than previous generations of lattice physics codes.

Several significant physics enhancements, including resonance upscattering, higher-order Pn scattering, extended depletion chains, and a localized energy-released-per fission model, make CASMO5 the most representative lattice physics code available.

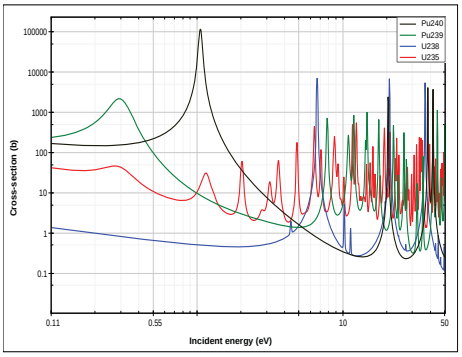
Accuracy

CASMO5 has been extensively validated against measured critical experiments, continuous-energy Monte Carlo calculations, and post-irradiation benchmarks. CASMO5 delivers exceptional accuracy for traditional and newer, advanced fuel designs.

Superior Nuclear Data: ENDF/B-VII.1

Using the most recent ENDF/B-VII nuclear data available, Studsvik has developed a high-resolution, 586-group neutron library for use with CASMO5. This extensive update from the previous 70-group CASMO library improves accuracy and reduces reliance on approximate resonance treatments.

CASMO5 also includes an updated 18-group gamma library for gamma-sensitive in-core detector modeling and gamma energy deposition calculations.



Cross-section data is available for over 450 nuclides and materials, including more than 250 explicitly defined fission products and 60 heavy nuclides, making this library state-of-the-art in every sense.

Applications

CASMO5 is commonly used to generate cross-section data for SIMULATE. CASMO5 can help support efforts in the following areas:

- Fuel management
- Core follow
- Plant operations
- Reload physics
- Spent nuclear fuel management

CASMO5 can also perform burnup credit analysis as expanded MxN capabilities explicitly model fresh and depleted fuel and fuels storage rack components.

Ease of Use

The CASMO5 'Keyword' driven input format is designed to be simple to use, modeling complex fuel designs with just a few lines of input. Common fuel assembly materials are pre-defined and geometric thermal expansion is automatically calculated. It is equally capable of modeling PWR and BWR fuel with little effort on the part of the user, making CASMO5 the perfect solution for organizations performing mixed-unit analysis.

All cross-section libraries required by SIMULATE5 are automatically generated by CASMO5. Cross-section data for SIMULATE-3 is also generated for use in S3K and Studsvik core monitoring software.

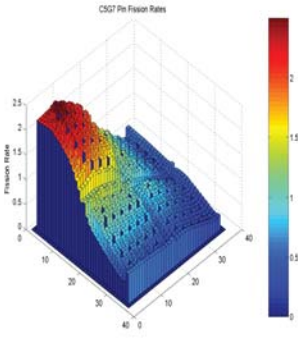
Requirements for CASMO5

Written entirely in Fortran-95, CASMO5 is available for all standard computing platforms running most modern 64-bit operating systems. Linux, Windows, and UNIX are all suitable environments for CASMO5.

Unparalleled Support

Studsvik customer support is second to none. Our nuclear engineering staff are here to help.

E-mail: info-cms@studsvik.com
www.studsvik.com



CASMO5 accurately models any type of commercially available fuel designs with simple, straightforward input designed to get your model right the first time.

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