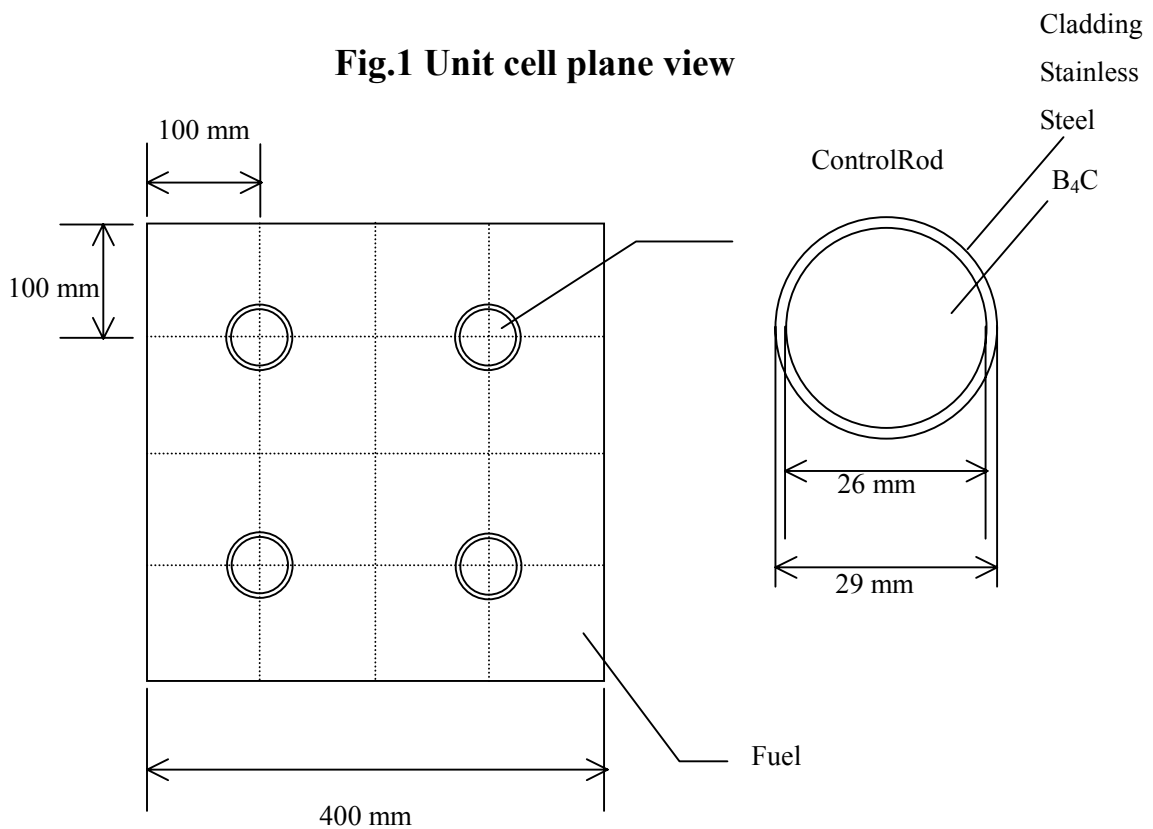


AFPR (USA)-supercritical

Unit Cell Description

Geometry of a unit cell is a square. A unit cell has three components such as fuel, supercritical water and control rods. And outer boundary condition is reflective. Power density in the fuel region is 18.0 W/cm^3 .



1. Fuel

Coated particle fuels fill the fuel regions with porosity of 0.35. The parameters of coated fuel pebble is shown in Table 1

Table 1. Micro-Fuel Element parameters

| Material | Density, g/cm³ | Diameter, cm |
|------------------------------|----------------------------------|---------------------|
| UO ₂ Enr U235-15% | 10.8 | 0.35 |
| PyC (buffer,porous) | 1.0 | 0.37 |
| PyC (dense) | 1.8 | 0.375 |
| SiC | 3.2 | 0.395 |
| NbC | 8,2 | 0.4 |

The average temperature of fuel is 430 C

2. Supercritical water

The porous part of the fuel region is filled with supercritical water with the following parameters:

Pressure 25.0 MPa

Temperature 380 °C

Average density
of supercritical water 450.0 kg/m³