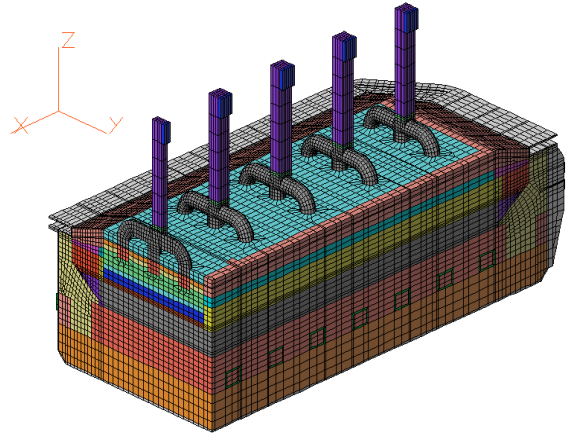
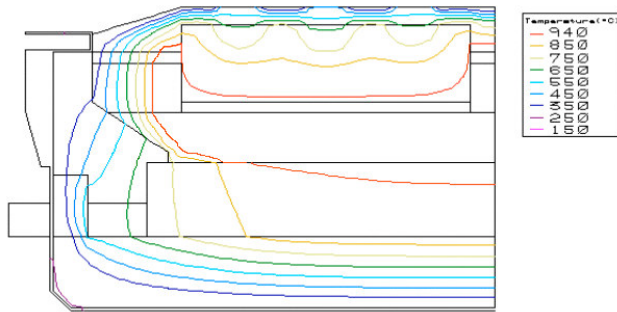


ALUMINIUM REDUCTION CELL ANALYSIS - VALESUL

PCE did the thermoelectric analysis of the electrolytic cell of Valesul – RJ – Brazil, using the finite element method (FEM) with software Algor Inc and PCE software SteCell. The goal of this analysis was to define, in partnership with Jeff Keniry from Alumination Consulting Company – Australia, a new lining for the cell so that it could work with higher electric current. We began making a validation of the original cell design and then the simulation of the new design. Also, heat flux measures and temperature were used for the model validation and to define boundary conditions. The figure beside shows the FEA model used. Because of the geometric and loading symmetry it was possible to do the analysis with a quarter model. The next figure shows the isotherms of the original cell.

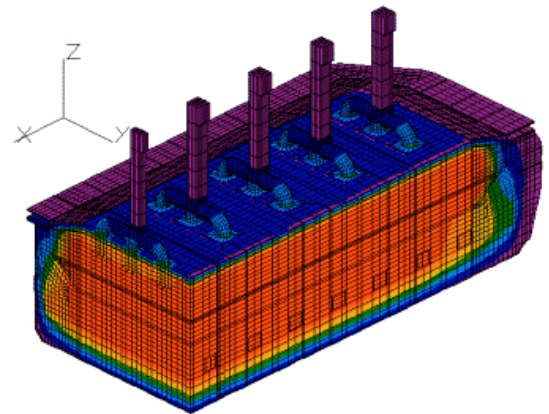


FEA model of the original cell with mesh.



Isotherms output of the original cell.

Using the finite elements as a tool it was possible to verify the cell behavior at the original lining conditions and anticipate its behavior with the new proposed lining.



Temperature Distribution

Copyright PCE Ltda 2003.