Results and Implications

The solution method described above can be used to clarify the influence of the various parameters on the behavior of the solution, and further its results point to manifestation of pore pressure effect in the HTHP cementing problem.

There is totally total 12 independent parameters that controls the behavior of the solution, grouping their natures, these parameters can be divided into four groups:

Conductivity properties group: 

Mechanical Properties group: 

Biot Properties group: 

Thermal Properties group: 

For cement, a typical value of these parameters can be found by the following tables:



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters (Unit) | Permeability  () | Thermo-osmosis Coefficient  () | Thermal Conductivity  () | Mechanical-caloric Coefficient  () |
| Value |  |  |  |  |

: Kelvin

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters (Unit) | Shear Modulus  () | Bulk Modulus  () | Poisson’s ratio |
| Value |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters (Unit) | coefficient of volumetric thermal expansion of fluid  () | coefficient of volumetric thermal expansion of solid  () | specific heat of the porous medium (solid and fluid) () |
| Value |  |  |  |

: Kelvin

|  |  |  |
| --- | --- | --- |
| Parameters (Unit) | Biot effective stress coefficient | Skempton pore pressure coefficient |
| Value | 0.98 | 0.95 |

The input parameters for modeling results for this section are listed in the table above. Assign the temperature difference between cement and formation to where .

When the wellbore wall in permeable, the influence of these factors on the pore pressure will be conducted to illustrate for isotropic medium in this section.