

## **GeoWell – Flexible Coupling for Thermal Stress Mitigation**

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**Keywords:** thermal stress, casing failures, stress mitigation, flexible coupling

Thermal expansion of steel casings of geothermal wells results in generation of high stresses that lead to permanent non-recoverable deformations that can induce immediate or subsequent casing failures. Such failures can inhibit production and cause risk of blow-out into the formation and/or to the surface. Flexible couplings, a new patent pending solution, have been designed to mitigate thermal expansion by allowing displacements of each ~12 m section replacing conventional stagnant connections. In the GeoWell project, three prototype versions of the flexible couplings were developed, built and mechanically tested at ambient temperatures in laboratory. Along with finite-element calculations, the test results proved to be valuable for development of the design. The test results demonstrate: (I) the structural integrity and load capacity, (II) confirmation and quantification of the mechanical function and (III) the sealability of the connection.