

Solution to efficiently produce oil in wells having fluid temperatures up to 392 °F (200 °C)

Challenges

- High fluid temperature more than 302 °F (150 °C)
- Frequent breakdowns due to overheating

Results

- Stable operation of submersible equipment with extreme heat:
 - motor temperature up to 482 °F (250 °C)
 - fluid temperature up to 392 °F (200 °C)

We have developed the improved pumping equipment adapted to high temperatures, which ensures steady operation in the harsh conditions of high-temperature wells with temperatures up to 392 °F (200 °C).

The operation of wells with fluid temperatures exceeding 302-392 °F (150-200 °C) using standard pumping equipment not adapted to high temperatures is impossible: each unit is incredibly overheated, which leads to the destruction of pump components and melting of motor and seal components.

In our solution, we use high-temperature elastomers and mechanical seals in the hydraulic protection unit. Lex high-efficiency PM motors have no electrical or magnetic losses and are less heated. In addition, they use a high-temperature-resistant synthetic oil and a special wire compound.

The main difference between the permanent magnet motors and asynchronous motors is that the permanent magnets are mounted in the rotor instead of the short-circuited squirrel cage to reduce current loss. The electronic engine control system transmits alternate current to the stator coil, and the rotating electromagnetic field attracts the magnet poles to rotate the rotor. The rotor and stator are synchronized to omit slips and magnetic loss. The low starting current reduces the load on the entire electrical system's power network, extension cable, and insulation materials.

All these improvements have

provided reliable, stable operation of submersible equipment with a comprehensive delivery range, with internal engine temperatures reaching 482°F in wells with extreme fluid temperatures up to 392 °F (200 °C).