# Nanocomposite Elastomers to withstand High Temperatures

ID# 2019-4976





Exemplary elastomeric gasket

# **Technology Summary**

Elevated temperatures increase the risk of polymer decomposition and degradation accompanying the formation of radial cracks and softening, which will consequently deteriorate the primary role of elastomers, zonal isolation. This method improves the thermal stability of cheap elastomers by adding certain low cost nanoadditives.

## Application & Market Utility

Elastomers are often used for sealing the pipe connection and fixtures in the surface application in the oil and gas industry, however, when it comes to building geothermal wells, these materials fail to provide hydraulic isolation at elevated temperature range of these reservoirs. This invention improves the thermal stability of nitrile butadiene rubber (NBR), silicone rubber (SR), and other cheap elastomers allowing them to hold up in temperatures beyond 250–300°F.

## **Next Steps**

Seeking licensing and/or collaboration opportunities.

## **TECHNOLOGY READINESS LEVEL**

1-3

#### Seeking

Licensing | Research

#### **Keywords**

- elastomer
- natural rubber
- silicone rubber
- acrylonite-butadiene
- nanoadditives

#### Researchers

#### Arash Dahi Taleghani

Dr. Charles H. Bowman and Lynn A. Holleran Early Career Professorship in Petroleum and Natural Gas Engineering

Online Bio

### Seyedeh Maryam Tabatabaei

Postdoctoral Scholar Website

VVCDSICC

#### **Originating College**

College of Earth and Mineral Sciences

#### **Office of Technology Management Contact**

Douglas Gisewhite drg206@psu.edu 814.865.6961



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.