Oilfield polymers – opportunity and innovation

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Abstract: Even before Spindletop "gushered" in the great Texas Oil Boom in 1901, polymers played a key role in the pressure and flow control of hydrocarbons from petroleum reservoirs. The early applications of polymer in the oilfield involved Natural Rubber, usually associated with Canvas cloth, acting in combination as a seal. With the invention of synthetic polymers, the variety of applications have exploded to the point that polymers are used on a 24/7 basis in our everyday life as well as in the energy production industry. This key role for rubber in the oilfield continues, where the cost of construction of an oil or gas well can exceed a billion dollars. Almost all equipment used in downhole drilling and completion operations currently depends on elastomers and other sealing materials to provide steady, reliable performance during service.
Although the cost of the individual seals used downhole in a well represents only a fraction of the total well cost, the seals are critical to well performance and safety. Sealing mechanisms are at the heart of any drilling, completion, or production system and are the primary components on which the functional success and longevity of the system rests. Modern drilling systems, with their significant use of onboard electronic components and sensors, rely heavily on non-metallic seals to prevent well environmental contamination while withstanding sustained dynamic loadings throughout service. Well completion systems can be categorized by either relatively short-term applications, after which seals can be changed or maintained; or long-term applications, where seals are expected to perform without change or maintenance for 20 years or longer. The assurance of these systems' continued performance throughout the life of the well, whether the expected life is short or long, is of vital importance

Biography: Jim Goodson is a Senior Technical Advisor for Baker Hughes Inc. located in Houston, Texas. He began his carrier with Baker Hughes in 1981 after 10 years' previous employment in the tire and oil field rubber molding industry. Jim is responsible for initiation and development of Baker's technical program for polymer research and specification as well as material testing, component evaluation and material application on a worldwide basis. In addition, he initiated the introduction of Computer Simulated Technology into the non-metallic material design process for Baker Hughes – completion and production. Jim has authored 27 papers and has 7 patents with 6 applications in process. He is a Charter Member of the Energy Rubber Group, active in NACE having served as Chairman of Task Groups TG 33 and STG 33 in addition to serving as N1 Group Technical Coordinator responsible for five NACE STGs relating to Corrosion Prevention and Control for Oil and Gas Production, Petroleum Refining, and Gas Processing Industries. He also edited the non-metallic section of the NACE Basic Corrosion Course. In addition, he currently sits on the ISO 23936 Committee developing a five part standard for qualification of "Non-metallic materials in contact with media related to oil and gas production."