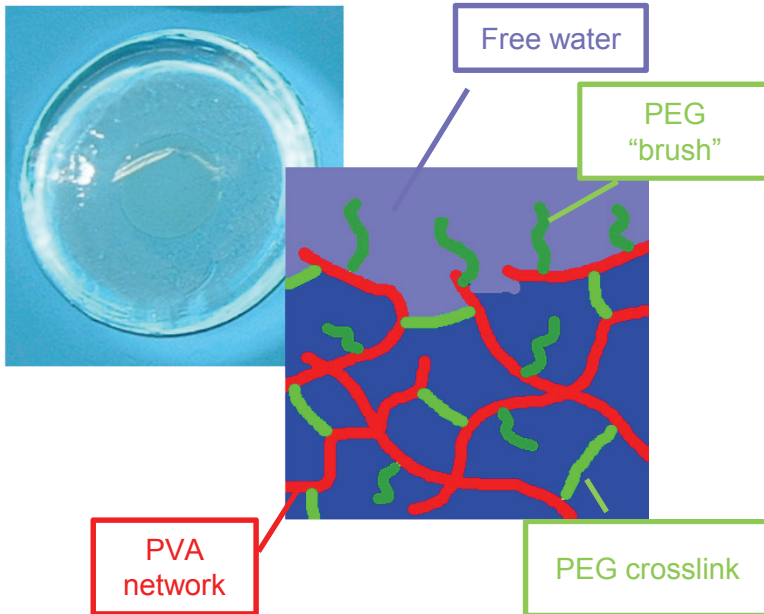


Replacing cartilage with hydrogels

Summary

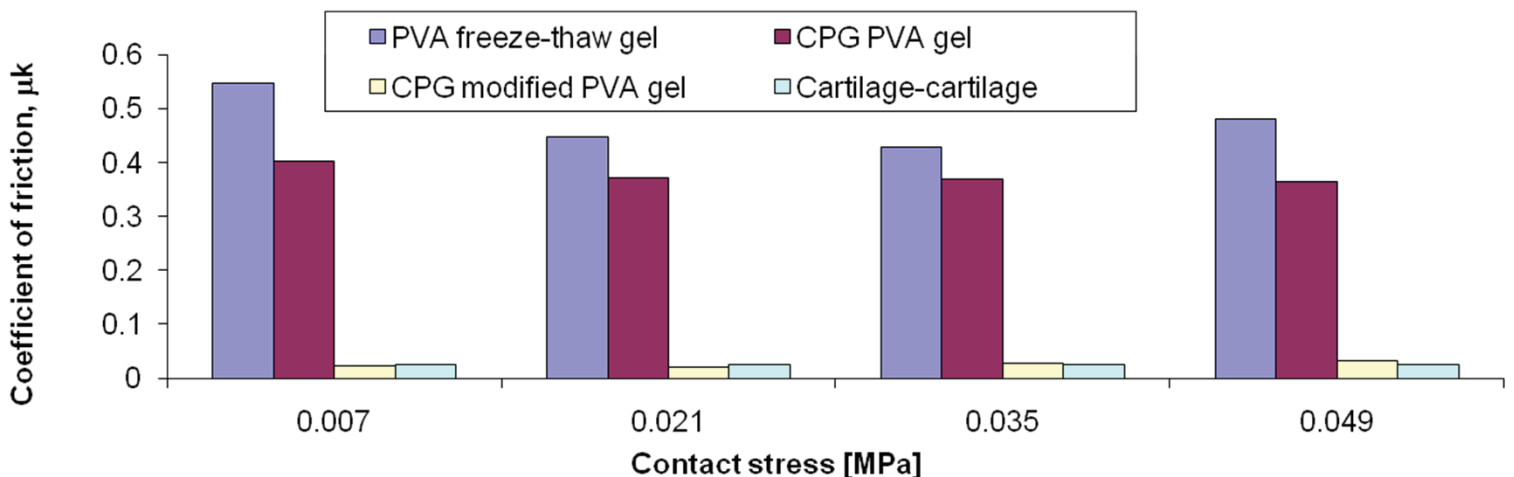
Replacing cartilage with a functionally equivalent soft solid is considered a superior treatment for arthritic joints. Cambridge Polymer Group has developed a very low friction elastic hydrogel material based on the concept of entrapped hydrophilic moieties and dangling polymer brushes. This material was conceived as a synthetic analog to the structure of cartilage where collagen provides a network supporting and confining the highly water-loving proteoglycans.

Deacetylated VA - PEG gel



Description

The material is a copolymer of vinyl alcohol and polyethylene glycol methyl ether methacrylate (PEG-MMA) manufactured in a unique manner. The PEG side chains form a hydrated lubrication sheath around the PVA main chain and constrain water within the network. This results in extremely low friction at the surface of the material. These materials are initially cast as vinyl acetate – PEG copolymers in the desired shape. Vinyl acetate groups are then converted to vinyl alcohol, and the material is equilibrated in water to form a gel. These materials are 30 to 80 % water, depending on composition, transparent and exhibit dynamic coefficient of friction values of less than 0.05, close to that of cartilage.



Applications

- Cartilage replacement
- Low friction interface for prosthetic joints
- Contact lenses



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Rev: 06/03/11

ANALYZE • RESEARCH • CREATE

Cambridge Polymer Group, Inc. is a contract research laboratory specializing in materials. We partner with our clients to solve problems utilizing our multi-disciplinary research team and full service laboratory.

We work with clients throughout the product life cycle to:

- **Develop new materials**
- **Design prototypes for proof-of-concept studies**
- **Create and execute experimental design**
- **Validate and verify manufacturing processes**
- **Perform root-cause analysis in product failures**

Cambridge Polymer Group, Inc. was founded in 1996 to provide a cost-effective resource for testing, research and development to clients who need periodic access to Ph.D.-level scientists and their support structure. We have developed a host of testing methods and materials for our clients, which number more than 300.



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