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From excellent damping and barrier properties to gel applications – Two new HSBCs for potential medical use	220
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Based on a long-term research experience in hydrogenated elastomeric block copolymer plastics and in vinyl-polydiene soft block manufacturing, Kuraray has developed two new materials. Both show superior properties and have high potential for medical applications.

Due to its glass transition temperature T_g near room temperature the new high molecular weight Hybrar grade has high vibration damping properties. It combines oil absorption and good miscibility with polypropylene with oxygen barrier properties. Within this article key parameters of this grade are presented. Moreover, a compounding concept of this material is described. The second new material belongs to the Septon series and is designed for improved gel stability and resilience. Because polyolefinic-based viscoelastic gels are widely used as cushion materials the processing has special needs in flow and dynamics. We will present key properties of this material together with processing instructions and a comparison to other materials.

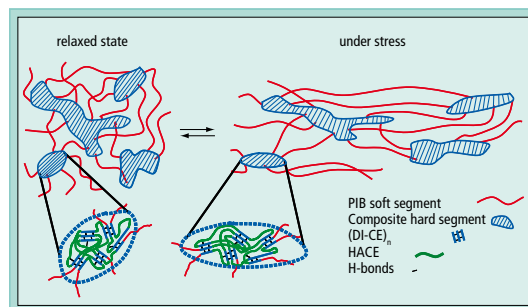


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Unprecedented combinations of mechanical properties, chemical stability and biocompatibility – Novel polyisobutylene-based polyurethanes 227

Conventional polyurethanes exhibit excellent combinations of mechanical properties, however, limited oxidative/hydrolytic/biological stability. We developed novel polyisobutylene (PIB)-based PUs having mechanical properties similar to those of commercial PUs together with unprecedented chemical stability. Our achievement was guided by increased insight into the structure/morphology/property relationship of PUs, and by our ability to control (i) hard/soft phase compatibility, (ii) hard phase stiffness versus flexibility, and (iii) the nature of H-bonding. For example, we precision synthesised PUs by using 4,4'-methylene-bis(cyclohexyl isocyanate) (HMDI)/1,6-hexanediol (HDO) hard segments and PIB/poly(hexamethylene carbonate) (PC) soft co-segments that exhibited ~ 31 MPa tensile strength, ~ 600 % elongation and resistance to 35 % HNO₃; under the same conditions, Elast-Eon (PDMS-based PU) and Bionate (PC-based PU) degraded severely. PUs containing exclusively PIB soft segments in conjunction with novel chain extenders also exhibit excellent mechanical properties and chemical-biological resistance. We propose that the presence of chemically resistant PIB soft segments protect vulnerable other constituents (i. e., bring about superior chemical stability) and yield biocompatible surfaces.



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