Study on Properties of Fluorosilicone Rubber with Good Resistance Against 15# Aviation Hydraulic Oil under Wide Temperature Range

LEI Haijun, ZHANG Jizhong, GONG Wenfeng, ZHAI Guangyang, WANG Xin

(Northwest Rubber and Plastic Research and Design Institute Co., Ltd, Xianyang 712023, China)

Abstract: The fluorosilicone rubber with good properties over a wide temperature range was prepared by mechanical blending of homopolymerized fluorosilicone rubber and modified copolymerized fluorosilicone rubber. The effects of the blending ratio on the physical properties, resistance against 15# aviation hydraulic oil and low temperature resistance of the compound were studied. The results showed that, with the increase of the amount of modified copolymerized fluorosilicone rubber, the hardness of the compound decreased gradually, the change of tensile strength was very small, the elongation at break and permanent deformation at break increased gradually, but the increase was small, the oil resistance decreased, and the low temperature resistance was improved significantly. When the blending ratio was 50/50, the brittleness temperature of the compound (multi-sample method) was −64.7 ℃, the compression coefficients at −50, −55 and −60 ℃ were 0.51, 0.44 and 0.39 respectively, and T_{R10} was −67.2 ℃. When the blending ratio of homopolymerized fluorosilicone rubber/modified copolymerized fluorosilicone rubber was 70/30, the rubber compound had the best balanced performance of low temperature resistance and 15# aviation hydraulic oil resistance, the dynamic sealing ring had no leakage, no damage or permanent deformation after 10 cycles in the bench test and showed good sealing performance in the wide temperature range of −60～150 ℃ and 15# aviation hydraulic oil environment.

Key words: homopolymerized fluorosilicone rubber; modified copolymerized fluorosilicone rubber; wide temperature range; sealing; oil resistance; low temperature resistance

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（张晓君　徐　阳）