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飞机座舱复合玻璃电磁性能和透光性能研究

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THE STUDY ON ELECTROMAGNETIC AND OPTICAL PROPERTIES OF AIRCRAFT WINDSHIELD MULTILAYER COMPOSITE-GLASS

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摘要

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摘要 研究了电磁性能,如电磁波后向散射功率、吸收功率以及反射功率与透明导电膜的内在关系;研究透光性能,如光学膜系的优化设计等。提出了透明导电膜与多层玻璃合理组合以提高电磁性能;薄金属膜与多层光学膜合理匹配以提高透光率。采用溅射和蒸发镀膜方法分别实现了上述优化设计的光学膜系结构,并与多层玻璃合理层合后,斜入射电磁波后向散射功率下降10dB,透光率可达到77%。

关键词: 飞机座舱 玻璃 电磁性质 光学性质

Abstract: Aircraft windshield composite glass with a transparent conducting film on it have high electromagnetic and optical properties. This thesis studies mainly its electromagnetic function, for example, the internal relations between the transparent conducting film and backscatter radar power, electromagnetic absorptivity and reflectivity. Also studied is the optical transmittance of the compound glasses, such as the optimal design of multi layered thin films. A rational coupling between the transparent conducting film and the compound glasses is proposed to improve its electromagnetic properties and so is a rational coupling between the thin metal film and multilayer optical films to improve the transmittance. The abovementioned optimal design of multi layered thin films was completed and some qualified specimens were made by sputtering and evaporating method. After a rational match with the compound glass, its oblique incidence backscatter radar power dropped 10dB and its optical transmittance came to 77%.

Keywords: aircraft compartments glass electromagnetic properties optical properties

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