

高耐水木纤维基高压装饰板的制备与性能研究*

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摘要:【目的】纤维板是人造板行业的一种传统板材,由木质纤维与合成树脂粘合剂在高温高压条件下压制而成,主要应用于建筑和家居领域,其具有密度均匀和易于加工等优点。作为一种资源利用率高的产品,其不仅能取代传统木单板得到更好的经济效益,还对环境保护和城市绿色发展产生了重要影响。然而,纤维板的耐水性能差、强度低、同质化高这些问题严重制约了其在建筑和家居领域的发展,对于包装等其他领域更无法适用。【方法】为了解决纤维板耐水性能差、同质化现象严重的问题,通过将低密度轻质纤维板浸渍酚醛树脂,在进行高温热压的方法,将低密度轻质纤维板转化成为木纤维基高压装饰板。【结果】通过浸渍热压后得到的高压装饰板密度为 1.42g/cm^3 ,扫描电子显微镜(SEM)观察结果证实酚醛树脂与纤维紧密结合,在纤维表面形成了覆盖层。同时高压装饰板耐水性能得到改善,得到最优的浸渍酚醛树脂质量占比为 20%,弯曲强度达到 84.05 MPa,弹性模量达到 7681.69 MPa;其 24h 吸水厚度膨胀率为 6.57%,24h 吸水率为 8.3%,2h 沸水水煮吸水厚度膨胀率为 16.44%,2h 沸水水煮吸水率 13.03%。此外,浸渍热压后得到的高压装饰板拉伸强度和柔性变形性能也得到了提高。【结论】这种高耐水、高强度的高压装饰板有望应用于建筑、包装、家具等领域,为提高纤维板应用领域和范围提供了一定的理论依据。

关键词: 纤维板;高耐水;高强度;酚醛树脂;

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Preparation and performance study of high water-resistant wood fiber-based high-pressure decorative panels*

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Abstract: 【Objective】Fiberboard is a traditional panel in the man-made board industry, made of wood fibers and synthetic resin binders pressed under high temperature and high pressure conditions, mainly used in construction and home furnishing fields, with uniform density and easy processing and other advantages. As a product with high resource utilization, it can not only replace the traditional wood veneer to get better economic benefits, but also has an important impact on environmental protection and urban green development. However, the poor water resistance of fiberboard, low strength, high homogeneity of these problems seriously constrained its development in the field of construction and home, for packaging and other areas can not be applied. 【Method】In order to solve the problems of poor water resistance and serious homogenization of fiberboard, low-density lightweight fiberboard is transformed into wood fiber-based high-pressure decorative panels by impregnating low-density lightweight fiberboard with phenol-formaldehyde resin, and then hot-pressing it at high temperature. 【Result】The density of the high-pressure decorative board obtained after impregnation and hot pressing was 1.42 g/cm^3 , and the scanning electron microscope (SEM) observation results confirmed that the phenolic resin was tightly bonded with the fibers, and a covering layer was formed on the surface of the fibers. At the same time, the water resistance of high-pressure decorative panels was improved, the optimal impregnated phenolic resin mass ratio of 20%, the bending strength of

84.05 MPa, the modulus of elasticity of 7681.69 MPa; its 24h water-absorbing thickness expansion rate of 6.57%, the 24h water absorption rate of 8.3%, the thickness of the water-absorbing thickness expansion rate of 2h boiling water cooking is 16.44%, the water-absorbing 2h boiling water cooking rate of 13.03%. In addition, the tensile strength and flexible deformation properties of the high-pressure decorative panels obtained after impregnation and hot pressing were also improved. 【Conclusion】 This high water-resistant, high-strength high-pressure decorative board is expected to be used in construction, packaging, furniture and other fields, which provides a certain theoretical basis for improving the application fields and scope of fiberboard.

Key words: Fiberboard; high water resistance; high strength; phenolic resin;