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QUALITY CONTROL OF RED CERAMICS FROM RIO GRANDE DO NORTE, BRAZIL

Elcio Correia de Souza Tavares¹, Danilo Duarte da Costa e Silva¹ and Marcílio Nunes Freire²

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elciotavares@unp.br

¹ Universidade Potiguar, Brazil

² Universidade Federal Rural do Rio Grande do Norte, Brazil

INTRODUCTION

In Rio Grande do Norte, Brazil, there is a park covering ceramic companies producing bricks, tiles and other red ceramic products. These companies are predominantly located in rural areas, concentrated around Natal, in the valley of the Assu river, and at Serido region. The sector is composed predominantly of micro-management group or family of low demand technology. These characteristics make this segment very important to the economy of the state, because they generate jobs in rural areas, contributing significantly to the man set at the country, preventing their migration to large cities. Overall, however, the product quality is very poor, leading to inappropriate use of raw materials, waste of energy, poor conformation of the product, environmental degradation, disagreement to the Brazilian and international standards, etc. So, its crucial improves the produced bricks. The Weibull distribution it's used mostly for designing with ceramics and it adequately fits a wide range of data. For samples of constant size and shape, the resultant distribution is given by an expression where the survival probability at a given stress, shows which percentage of the samples survive, and provide a parameter called the Weibull modulus. The fracture strength variation in the tension of this composite has been modeled using Weibull distribution. In this respect, the Weibull distribution allows researchers to describe the fracture strength of a composite material in terms of a reliability function. It also provides material manufacturers with a tool that will enable them to present the necessary mechanical properties with certain confidence to end users. In this work are presented physical and mechanical properties of ceramic bricks from Rio Grande do Norte (Brazil), showing their low quality. Also, are presented suggestions to improve these properties.

METHODOLOGY

Physical properties of ceramic bricks from Rio Grande do Norte state (Brazil) were studied by measuring porosity, water absorption, linear shrinkage, bulk density and mechanical strength. Mechanical strength test data resulted in Weibull distributions. The Weibull statistic parameter was calculated to best evaluations of ceramic quality.

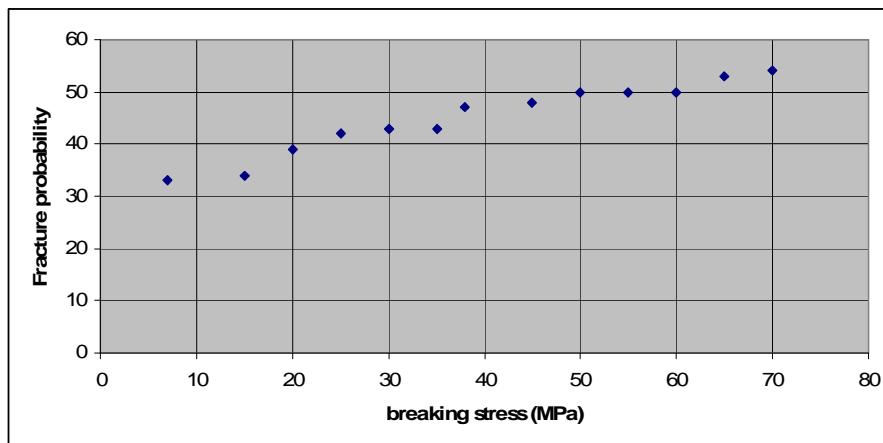
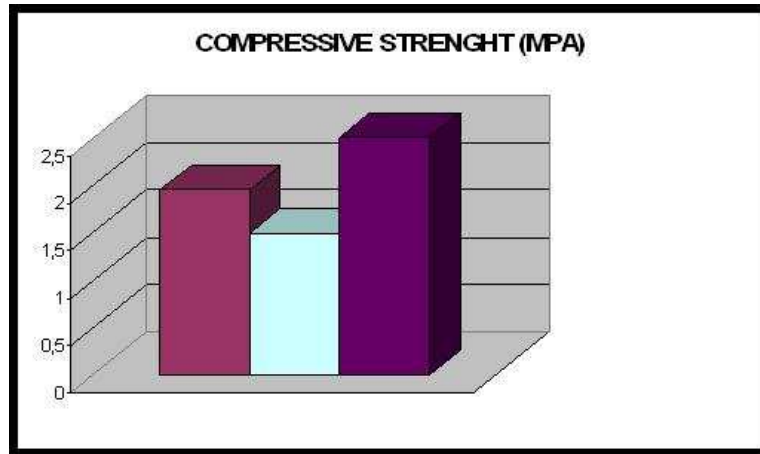
RESULTS AND DISCUSSION

Table 1 shows a summary of visual tests from ceramic tiles.

ITEM	CRACK	BREAK	DEFORMATION	IRREGULAR SURFACE	COLOR VARIATION
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Brick	62%	29%	91%	87%	83%
Brazilian standard	0%	0%	0%	0%	0%

Figure 1 shows the medium compressive strength of a set of bricks compared with Brazilian standard. The results are below of the minimum allowed. Figure 2 presents the fracture probability x breaking stress, showing low values to breaking stress.



The results support our initial considerations about current stands of low quality of ceramic tiles from Rio Grande do Norte and underline the importance of testing and improving these products.

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