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ANALYZING AND IMPROVING SURFACE PREPARATION

#surface characterization #material performance #surface preparation
#cleanliness analysis #benchmarking

Groupe Atlantic, a French leader in thermal comfort solutions, aims to offer its customers products with unrivaled performance and reliability. It is in this spirit that the industrial company contacted Capacités' experts in materials chemistry. Their goal was to find solutions that could optimize the enameling process and extend the lifespan of electric water heaters' metal tanks.

CHARACTERIZING SURFACE QUALITY AND ITS IMPACT ON COATING ADHERENCE

A main factor of quality for heating appliances is their average operating time before they break down. Even though water heater tanks are protected with enamel, they are highly susceptible to corrosion, which can lead to leaks and breakages over time.

Capacités' experts visited several of Groupe Atlantic's industrial sites and analyzed each step of its enameling process, from surface preparation to actual enameling. The first step, preparation, was studied in detail. The experts suspected a strong correlation between surface cleanliness prior to enameling and the enamel layer's adherence over time.

They readily combined several analysis techniques, including surface topography by confocal microscopy, the Bresle method, infrared spectroscopy, and scanning electron microscopy.

These characterizations allowed the parameters of the preparation process to be associated with output on tank surface quality before applying enamel.

The same surface quality data allowed guidelines to be established for a benchmarking study that aimed to identify alternative pre-enameling surface preparation techniques. Capacités' engineers made a series of recommendations based on this study, which led to improved surface preparation processes, especially through easily replicable monitoring techniques.

To complete this project, the Capacités' experts benefited from support and technical equipment from the IMN (Jean Rouxel Material Institute), joint research unit of Nantes Université and the CNRS.■

Project carried out for:



Linked expertise:

- Materials

CAPACITÉS SAS :

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