

Sustainable Research and Development via Automated Formulation and Attribute Characterisation of Novel Coatings

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The research and development of novel coatings is a time consuming process and is associated with a notable expenditure for raw materials and consumables used in the production and testing of samples. Automation of the manufacture and testing of these samples has been shown to provide a significant reduction in cost and a substantial increase in sample generation. Accurate dispensing of raw materials, including liquids, slurries, gels and powders to 2 mg tolerances enables the creation of precise formulations at low sample volumes. Miniaturisation of the tests regularly associated with coatings, including rheology, opacity, colour, gloss, burnish resistance and scrub resistance,



Inside a coatings analysis system: Showing a spectrophotometer, gloss meter and temperature and humidity monitoring.

allows the system to capitalise on its production accuracy, requiring only a 1/20th of the sample generated in the laboratory to produce comparable data. The automated testing regimes create a 95% reduction in consumables spend when compared with previous practices, have improved reproducibility and are completely objective. Since robotic systems can undertake 24 hour operation and employ efficient work flows, a single employee can produce and test more than 30x as many novel formulations as they would have in the laboratory using traditional techniques. Data is automatically archived allowing investigation of historical experiments and data mining of massive formulation libraries. These advances provide a strategy towards a greater understanding of larger areas of formulation space and rapid delivery to market. The investment in an automated system will realise its value many times over in its operational lifetime.



An automate scrub and burnish resistance testing system.