Paints and Coatings

Time and Tide

Despite their 80-year history, the past is the last thing on anyone's mind at International Paint's cutting-edge research laboratory in Newton Ferrers.

The sleepy seaside village of Newton Ferrers would seem at first sight to be an improbable setting for some of the most advanced research on marine coatings underway anywhere in the world. On the banks of the River Yealm, perched on one of the UK's southernmost points, International Paint's laboratory sits among large houses with their own jetties, and looks over a picturesque estuary. Look carefully, however, and you will spot test rafts dotted amongst the yachts. They house hundreds of paint formulations undergoing real-life tests over months, and sometimes years.

You might wonder why Newton Ferrers was originally singled out as a vital scientific research site more than 80 years ago. There are, in fact, a number of sound reasons why this site made good sense and still does. The preparations for construction of the first test raft and immersion of the first marine coatings on 16th June 1928 demonstrated a clear vision of what was needed in a research establishment.

The possessor of that vision was Owen Duke Hunt, or O.D. as he was known. At that time O.D. was 36, and had been recruited to International Paint's Felling HQ laboratory the previous year. He set out a series of research objectives which, eight decades on, could hardly be improved upon. He identified the challenge of obtaining a comparative estimate of fouling on different paints; he saw the need for microbiological investigation of marine growth on steel plates in situ; he realised the effects of biocides on organisms; he stressed how important it was to study the life-histories of fouling organisms such as barnacles, hydroids, enteromorpha, blue-green algae and diatoms; and he saw the need to compile a comprehensive record of all types of fouling matter.

O.D. had chosen the Devon seaside village from a shortlist of several other potential UK sites because it met most closely some nine criteria that he had set out in a memo to management.

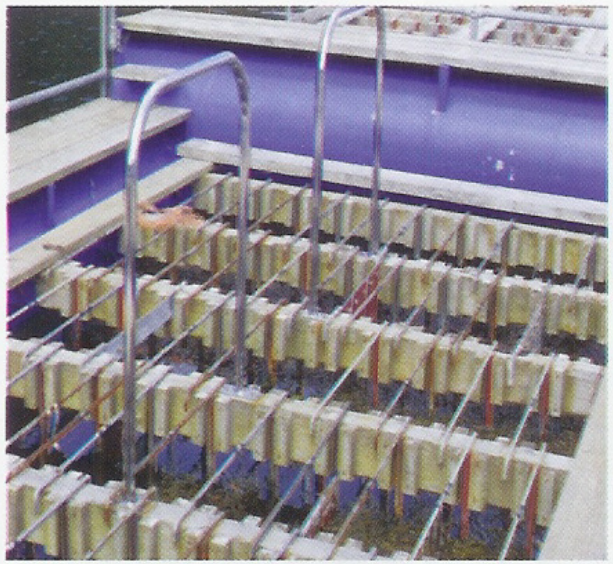
These included ready access to sea water in which there is good and rapid growth of fouling organisms; sheltered conditions but water that is frequently changed with the tide; water that is also clean enough and free of suspended matter to pump through laboratory tanks; accessible test rafts; and a good marine biology library nearby (which was available at the Plymouth Marine Biological Laboratory).

The early days at Newton Ferrers were not always an unqualified success. The effects of a range of variables – not really considered previously – skewed some of the early results. But it did not take long for the testing procedures to be refined, a process that continues even today.

Subsequent research at Newton Ferrers, led to the development and patenting of the first self-polishing copolymers, or SPCs, in 1975. Alex Milne, the 'godfather of foul release technology', was instrumental in the development of SPCs, and was responsible for the inception of International Paint's groundbreaking Intersleek product, which also began life at Newton Ferrers. A man with an extraordinary capacity for innovative thinking and a gift for connecting that to the market (he once ran a test immersing non-stick frying pans in water to see if the coating could be used in foul release – it couldn't), Milne noticed something interesting out on the rafts in the Yealm estuary one day in the early 1970s.

In those days, the test panels were affixed to larger boards using silicone sealants. Upon inspection, he realised that although the biocidal paints actually being tested had failed, the fouling growth could be rubbed off the silicone sealant. Years of testing and study later, Intersleek 425 was launched onto the market as a foul release coating for fast ferries. Since then the facilities at Newton Ferrers have continued to prove their worth: in 1999, it gave us Intersleek 700, which was

A fouling reference board being inspected



The panels are inspected frequently

the technology's first product for deep-sea marine vessels, and in 2007 Intersleek 900 came along, which is used on everything from warships to cruise liners. And it continues to play a vital role in the development of the next generation of foul release coatings. It's equally important to the Yacht side of International Paint's business, which is hard to escape as so many customers are right outside the front door!

There is undoubtedly a certain magic to the place and not surprisingly it has a very low staff turnover. But apart from the surroundings, a key motivator for the small team who work there is the fact that for more than 80 years, sleepy little Newton Ferrers has been right at the forefront of research into coatings technology.

Jewel in the Crown

"You can't bamboozle a barnacle," says Dr Chris Rhodes, current head of the six-strong research team in Newton Ferrers, and he should know.

At any one time, there are literally thousands of coating formulations undergoing a broad range of tests, spinning at high speed in sea water tanks inside the laboratory or submerged on the test rafts out in the estuary.

Despite the fact that International Paint has testing facilities all over the world, from Sweden to Singapore, he believes that the Newton Ferrers facility is a unique asset that sets International Paint apart – it is, he says, quite simply the jewel in the company's crown.

The laboratories themselves contain an array of highly complex equipment, representing an investment running into millions of pounds. They are designed to gather data on the properties of each coating, including leaching and polishing rates, and the effects that minor changes in formulation could have on a product's longevity and through-life performance. But however sophisticated the laboratory plant may be, neither Rhodes nor his colleagues underestimate the importance of the raft tests out in the estuary.

The raft testing procedures are rigorous – large panels are suspended for long periods, with experimental coatings applied next to standard paints with known performance, for comparison. But a number of variables are known to have a bearing on results, including weather, light intensity and water turbidity. For this reason the research staff at Newton Ferrers invented the 'Turtle Raft' in the 1950s, which is still unique to International Paint even today.

The raft, which lies in the estuary where the River Yealm meets the English Channel, models a ship's vertical sides, her turn of bilge and her flat bottom. Its purpose is to measure the rates of fouling of both plant and animal organisms. It's remarkable to compare the effects of light on fouling rates. Plant fouling requires light and therefore occurs on ships' sides, notably around the waterline, where it is relatively easy to see.

Animal fouling, on the other hand, needs no light and tends to attach to the flat bottom where it is more difficult to spot. Badly-fouled ships carry both animal and plant organisms and may have their frictional resistance through the water increased by as much as a third, with obvious implications for fuel consumption and emissions.

Rhodes and his team are probably already well aware of tomorrow's technology and potential coatings 'firsts' for International Paint. Not surprisingly, however, they are keeping those to themselves for the time being.

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