



Julian Ryall reports from Tokyo on how Japan's paint and coatings sector is facing tough times as COVID-19 hits after the Olympic boost ends

COVID-19 hits Japan's coatings industry

As with every business sector in every country around the world, Japan's paint and coatings industry has been thrown into uncertainty over the full impact and longer-term implications of the coronavirus COVID-19 that has swept the globe since first emerging in China in December 2019.

The Japanese government has tried hard to keep the wheels of business and industry turning and, until April 7, had resisted calls from a growing number of health experts to impose a lockdown on this nation of 127M people. That policy ran contrary to approaches adopted in many other developed countries, including the UK, France and Italy and with the number of infections increasing, new regulations went into effect the following day.

The new regulations still fall short of a lockdown, with residents of Tokyo, Osaka and five surrounding prefectures "requested" to not go out, to limit their shopping to purchasing essentials and avoid international travel entirely. Essential workers are exempt from the new rules and companies are being encouraged to find ways for employees to continue to work from home, with the aim being to protect the national economy.

That of course includes the country's major paint and coatings sector. Japanese manufacturers produced 1.646Mt of paints and coatings between January 1 and December 31, 2019, at plants within Japan and overseas, according to the Japan Paint Manufacturers Association (JPMA), down 0.3% on the previous year's output. Among the best-selling paints were non-solvent powder coatings and water-thinnable emulsion paints. According to figures from Japan's ministry of economy, trade and industry, Japanese paint firms' total sales in Japan for the year came to JP¥686.55bn (US\$6.36bn), down slightly more than 1.5% on the previous year's figure – and an additional 66,112t of paint were imported

over the course of the year, including from Japanese production facilities, worth JP¥33.5bn (US\$312.22M), according to the ministry.

Considering the size of this industry and market, the implications of a full business lock-down during the pandemic may well be dramatic. Analysts at Tokyo's Waseda University have suggested that a shutdown of the Tokyo metropolitan district for a period of one month would cost the nation a 5% slump in GDP, approximately US\$245.9bn.

■ TRADE WARS

Naturally, this will harm Japan's paint sector, which has already been losing business from the trade war between the United States and China over the last two years, given the large number of Japanese-owned coatings manufacturing plants based in China. Another threat has been posed by a trade dispute between Japan and South Korea – a major importer of Japanese paints, including for its shipbuilding industry – as a result of long-standing differences of opinion over historical issues. An agreement reached in 2017 between Seoul and Tokyo to provide compensation for former Korean "comfort women" forced to service Japanese soldiers with sex during WW2, was unilaterally scrapped by a new South Korean government in 2018, plunging bilateral relations to a new low and triggering a bout of accusations. One of the claims was that South Korea's lax export verifications were permitting banned technology to be passed on to North Korea.

When Seoul rejected the claims, Japan removed South Korea from its "white list" of favoured trading partners and in July 2019, placed new export controls on some chemicals, including coatings ingredient fluorinated polyimides.

Japanese coatings makers supplying South Korea's important shipbuilding sector have also suffered – traditionally a purchaser of specialist paints from Japanese firms, Korean firms have sought alternatives to specialist Japanese coatings products as a result of the trade row.

Similarly, Japan's domestic paint and coatings market will continue to be impacted by a shrinking population, with demand falling for everything from cars to houses, household goods, infrastructure and every other sector that has important business links to the paint industry. In 2019, Japan's population was estimated at 126.56M, down from a peak of 128M in 2010, with forecasts suggesting that the population could fall to a mere 85M by 2100.

Since it was announced in Rio de Janeiro in September 2013 that Tokyo had been chosen to host the 2021 Olympic Games and Paralympics, paint firms have been boosted by increased demand for paints and coatings in games-associated construction projects, although that uptick in demand came to an end with the completion of the final major infrastructure in March.

Another concern has been the Japanese government's decision to raise the tax on goods from 8% to 10%, which went into effect on October 1, 2019: "Shipments in the first half of fiscal 2019 were positive compared to the previous year, partly due to rush demand before the consumption tax increase," said Hideo Nakamura, JPMA executive director.

"There was a big reaction in the second half of the year and shipments fell sharply in the October-December period," he told APCJ. "In January – just when the downturn trend was about to end – the coronavirus outbreak brought about further falls for the January-March quarter."

Nakamura says that figures for March are expected to be "very bad,"

with projections for the full 2019-20 financial year, which ended on March 31, anticipating a decline of about 3% on the previous fiscal year.

He told *APCJ* that demand for paint for the construction sector was “very favourable” in the 12 months from October 2018 until the tax hike but has dropped off since October 2019. The impact of the coronavirus on new construction projects that would normally order paints and coatings could be “severe,” he added.

Demand in the auto sector appears to be following a similar trajectory, with demand tapering off since the tax increase, with sales slumping 10.3% in February, according to the Japan Automobile Dealers Association, and a further 9.3% in March – which could harm auto sector output and, hence, its demand for paint and coatings. Consumers are expected to further rein in their spending in the months ahead due to uncertainties over employment due to the coronavirus.

■ CORONAVIRUS DISRUPTION

Manufacturers are trying to put a good face on the outlook for the sector but they admit they are still trying to get a firm grasp of the full impact of the coronavirus.

“We are trying to evaluate the impact of the outbreak at the moment but it is difficult because it is changing every day,” said Masato Ichimura, a spokesman for Osaka-based Nippon Paint: “We have restarted operations at all our plants in China but we are not operating at 100% at all our sites. We cannot avoid a negative impact to some extent, particularly to the DIY segment in China, but things are happening rapidly in all our business segments.”

A report on Japan’s paint industry from UK-based market researcher GlobalData released in March said manufacturers were already facing a post-Olympic slump but their task has become harder as a result of COVID-19. With demand now likely to fall in tourism-related businesses, especially

given the Olympic Games have been postponed to 2021, the report suggests Japanese paint firms look abroad for compensating export sales.

A US\$3.8bn acquisition of Australia’s DuluxGroup by Nippon Paints in 2019 demonstrates that Japanese companies will seize such opportunities when they arise, the report says, adding that leading players in the industry, “are perfectly positioned to capitalise on new themes in demand, advances in technology and opportunities for market consolidation.” The energy market is one that looks particularly appealing, it concluded. ■

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New textile coating developed to protect PPE

Masks, gowns and other personal protective equipment (PPE) are essential for protecting healthcare workers. However, the textiles and materials used in such items can absorb and carry viruses and bacteria, inadvertently spreading the disease the wearer sought to contain.

Research from the LAMP Lab at the University of Pittsburgh Swanson School of Engineering may have a solution. The lab has created a textile coating that can not only repel liquids like blood and saliva but can also prevent viruses from adhering to the surface. The work was recently published in the journal *ACS Applied Materials and Interfaces*.

“Recently there’s been focus on blood-repellent surfaces and we were interested in achieving this with mechanical durability,” said Anthony Galante, PhD student in industrial engineering at Pitt and lead author of the paper. “We want to push the boundary on what is possible with these types of surfaces and especially given the current pandemic, we knew it’d be important to test against viruses.”

What makes the coating unique is its ability to withstand ultrasonic washing, scrubbing and scraping. With other similar coatings currently in use, washing or rubbing the surface of the textile will reduce or eliminate its repellent abilities.

“The durability is very important because there are other surface treatments out there but they’re limited to disposable textiles.

You can only use a gown or mask once before disposing of it,” said Paul Leu, co-author and Associate Professor of Industrial Engineering, who leads the LAMP Lab. “Given the PPE shortage, there is a need for coatings that can be applied to reusable medical textiles that can be properly washed and sanitised.”

Galante put the new coating to the test, running it through tens of ultrasonic washes, applying thousands of rotations with a scrubbing pad (not unlike what might be used to scour pots and pans), and even scraping it with a sharp razor blade. After each test, the coating remained just as effective. The researchers worked with the Charles T Campbell Microbiology Laboratory’s Research Director, Eric Romanowski and Director of Basic Research, Robert Shanks, in the Department of Ophthalmology at Pitt, to test the coating against a strain of adenovirus.

“As this fabric was already shown to repel blood, protein and bacteria, the logical next step was to determine whether it repels viruses. We chose human adenovirus types 4 and 7, as these are causes of acute respiratory disease, as well as conjunctivitis,” said Romanowski. “It was hoped that the fabric would repel these viruses similar to how it repels proteins, which these viruses essentially are: proteins with nucleic acid inside. As it turned out, the adenoviruses were repelled in a similar way as proteins.” The coating may have

broad applications in healthcare: everything from hospital gowns to waiting room chairs could benefit from the ability to repel viruses, particularly ones as easily spread as adenoviruses.

“Adenovirus can be inadvertently picked up in hospital waiting rooms and from contaminated surfaces in general,” said Shanks. “This coating on waiting room furniture, for example, could be a major step towards reducing this problem.”

The next step for the researchers will be to test the effectiveness against betacoronaviruses, like the one that causes COVID-19. “If the treated fabric would repel betacoronaviruses, and in particular SARS-CoV-2, this could have a huge impact for healthcare workers and even the general public if PPE, scrubs, or even clothing could be made from protein, blood-, bacteria- and virus-repelling fabrics,” said Romanowski.

At the moment, the coating is applied using drop casting, a method that saturates the material with a solution from a syringe and applies a heat treatment to increase stability. But the researchers believe the process can use a spraying or dipping method to accommodate larger pieces of material like gowns and can eventually be scaled up for production. ■

Source: www.sciencedaily.com