



The new state-of-the-art MAAS paint shop in Kaunas, Lithuania, with launch partner Ryanair.

# Anything but plain looking

**There is a lot more to painting an aircraft than meets the eye. It's not just about making them look pretty, and it's nothing like painting a car. LARA's Glenn Sands goes to MAAS Aviation to be enlightened.**

It's perhaps the one thing that catches the eye most when looking out across an airport hardstand – the paint schemes the airliners wear. Whether they're dressed in a subdued coat of white with just their operator's logo splashed on the tail or an entire collage of multi-colour artwork

covering the fuselage, it can take an awful lot of planning and preparation, and it's nothing like painting a car, commercial aircraft painter MAAS Aviation is extremely keen to point out!

But, according to Tim Macdougald, CEO of MAAS Aviation and Richard Marston,

Director Customer Services, Marketing and Sales for Europe, Middle East and Africa, with proper planning, the right facilities and a trained team, a regional-size airliner can be stripped and repainted within a week. Even for a complex paint scheme, like those recently unveiled by Aeroflot, a typical seven-day turnaround is what operators now expect, and MAAS Aviation can meet this challenge, with paint shops located in Germany, the Netherlands, Lithuania, and the United States.

As with many trades within commercial aviation, the paint shops of MAAS run 24-hours a day, seven days a week, with a three-shift workforce pattern in place, and according to Macdougald, the impact of COVID-19 was not as bad as one might have expected. The demand for aircraft to be painted never really lets up. As the pandemic hopefully nears its end, MAAS has seen its workload increase as operators returned aircraft to the lessors earlier than expected. Many of these aircraft need to be stripped and repainted in a typical overall white scheme as they wait to be leased out once more to the next carrier.



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**Tim Macdougald, CEO, MAAS Aviation**

The process for receiving and repainting an airliner is an extremely slick and well-practised procedure, as Macdougald explained to LARA: “It all starts with an aircraft arriving outside the paint shop. We have our own ground handling facilities, so we can tow the aircraft into place. We call this process ‘the input’. If we are doing a batch of the same type of aircraft, for example, Boeing 737s, we’ll likely have all the scaffolding systems or docking already in place. So, we effectively manoeuvre the aircraft into what we call the ‘dock area’. Once positioned, a pre-paint inspection is carried out by one of our qualified engineers. We’ll compare the aircraft’s condition to the paperwork we have been supplied with from the operator. This phase is known in the industry as the ‘dents and buckles’ inspection, whereby every flaw on the aircraft’s surface is recorded. If there’s a new dent, this may need to be investigated as to how it got there and when, but that’s only if the paperwork hasn’t recorded it. This is all part of the larger-scale safety inspection routines that we carry out throughout the painting process. “As part of the ‘input process’, once the aircraft is docked, we’ll mask all the sensitive parts like the pitot tubes, static boards, flight controls and any avionics panels. Any composite areas must be protected and undergo a separate process to remove the paint from these surfaces. “The aircraft is then cleaned, washed, and the surface is prepared. The old

paintwork is removed and any minor repairs to the surface are made at this time. It’s after this that the new paint layers are gradually built up.”

It sounds simple when explained like that, but it’s the experienced staff at MAAS that make it appear that way and the fact that it can all be accomplished in five to seven days. But Macdougald is quick to point out that at every stage, there’s an inspection by an engineer who signs-off the work, so allowing it to proceed to the next stage. After the work, a certified release to service

(CRS) must be achieved, during which the paperwork is thoroughly inspected before the aircraft re-enters service. At which point it’s removed from the dock, pushed out of the hangar and heads off on its way.

With the basic process described, it fell to Marston to describe the layers of procedures and paint and, most importantly, hitting those demanding delivery deadlines, which are often linked in with a particularly complicated paint scheme. “We have found that some of the deliveries are becoming more complicated, with everyone looking to return to the market at the same time. We’re currently working on several special schemes, with a lot of graphics tied in with an operator’s promotions. It means that with our base coat, clear coat system, we can lay down solid top colours which can dry in two to three hours, whereas in the past, they could take 10 hours to dry. So, if we have five to six colours to lay down on the aircraft, and with the shift pattern we have, these special schemes are something that we can accommodate if we plan.

**The highly skilled MAAS paint team applying the basecoat layer supported by the bespoke docking system.**





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**Richard Marston, Director Customer Services, Marketing and Sales for Europe, Middle East and Africa, MAAS Aviation**

“Although, I must admit we are getting many requests for just white now, which is due to a lot of aircraft coming to the end of their lease period and may well be changing hands, and the lessor may not quite know who that will be.

“One of the things that I do want to mention, relates to when an aircraft arrives at us. There’re normally two types of job requests, either a sand and paint or a complete strip and paint. Predominantly, we strip the airframe before repainting, as Macdougald points out.

“What I have noticed compared to 10 years ago is that the structural repairs performed are far more eco-friendly and this is illustrated when we strip the aircraft. Anything that gets highlighted in the inspection we can repair and then cover with a protective gel. The era of using chromates to seal any repairs is old school now.”

### COLOURFUL EVENTS

Despite ‘white being right’ there are several global promotional events that MAAS may well be asked to paint an aircraft for, as Macdougald explains: “Anyone with an Apple Mac is capable of designing a scheme for an aircraft, and every airline is keen to reinforce its brand or demonstrate that it’s sponsoring a particular event. Emirates and Etihad Airways have been very active

in promoting expos and grand prix and both have decorated their aircraft to promote these events. Our finishes are getting more complex and using a lot of metallic finishes, so paint companies are producing a lot of mica material to respond to this demand.

“You can’t put metallic paint onto an aircraft, due to the build-up of static, which can increase the risk of lightning strikes to the aircraft. So, the metallic finish we use is called mica. It’s effectively plastic metallic flakes within a coating, as opposed to metal.

It offers the same level of reflectivity in visible light as traditional older metallic paints do. Personally, and this is my view I must stress, post-COVID, I think many airlines will dumb down their schemes, to reduce unnecessary costs as they get back into their stride.

“But that doesn’t mean we are still not getting requests for ‘interesting’ schemes. And these can come in many forms to our graphics department. Sometimes, it will be just one photograph, or the idea described to us in a phone call. On these occasions, we engage with the customer quite a lot during the early stages, although this often applies to private and business jets that pass through our facilities. Airlines tend to send extensive digital files with all the necessary measurements and colour paint notes.

“We will make up spray masks, both in positive and negative forms, so if we are using blue and white, we can spray it either way round, rather than the more traditional lighter colour first.

“Although if it’s something new, the graphics and the paint team will work closely together before any paint hits the fuselage. Recently, Aeroflot has requested some extremely complex schemes involving

mica, solid colours, and then flower style graphics on top. It can involve quite a few conference calls when working on one of their aircraft!”

### FLEXIBLE FINISHES

When a freshly painted aircraft leaves one of MAAS’s facilities it looks spectacular, be it in overall white or a flamboyant multi-colour scheme. But the observer is missing a significant part of the process – the science behind the paint and the lengths being undertaken to ensure the process has the minimum impact on the environment.

Macdougald explains to LARA: “As I mentioned earlier, while chromates may offer protective capabilities, they’re extremely hazardous. It was the same with the primers that were used 15 years ago. Fortunately, we no longer have them within the industry. But European Union regulations are coming into play which means that their use will be further limited. Still, I don’t think those outside the industry are aware of what the paint on an aircraft undergoes daily?”

“Unlike the car industry, which has transitioned to a water-based coating process, the aviation industry is not there

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**Tim Macdougald, CEO, MAAS Aviation**

yet. There’s a specific reason for this, which people need to understand. The wing of any aircraft moves up and down in flight. For example, on a Boeing 787, the wing can move up and down by up to two metres. The paint must be able to cope with this flex. Along with this is temperature. On the ramp, it may be 40 degrees. In flight, it can drop to minus 50 degrees at 38,000ft. The aircraft expands by a few inches during a flight too. Any coating must be able to manage these changes routinely. So, aircraft coatings are vastly more sophisticated than what would be sprayed onto your car.

“Of course, water-based aircraft coatings have been trialled, and the organic compounds they have within them is simply not able to cope – yet.

“I think there’s a perception to those outside the aircraft painting industry that

it’s a dirty business, and we aren’t that concerned about the environment – that’s not the case at all. For example, the stripping chemicals we use to remove the paint layers are no longer toxic.

“All the paint shops at MAAS are state-of-the-art and have environmental control systems, and any wastewater goes into tanks and is disposed of properly.”

Marston adds to what the paint scheme has to endure once on the aircraft: “The final clear coat needs to be able to protect the overall paint finish for up to 10 years. It needs to be able to retain its gloss finish. Recently, I performed gloss readings on an aircraft that we had painted some time ago, and the readings were about 90-94 units out of 100, which is great. It’s down to the protection that the clear coat provides against UV and everything else that’s thrown at it daily.”

### FUTURE COVERAGE

Asked what the future has in store for painting aircraft, both Macdougald and Marston say a progressive reduction in drying times is significant. The days of leaving a recently painted aircraft for 10 hours in the shop to harden is gone, given the schedule that MAAS must maintain. This will go together with further reducing the impact on the environment.

Another key factor is the amount of paint put onto the airframe. The need to keep the opacity of each colour high while at the same time reducing the amount used will have the knock-on effect of reducing the weight of the aircraft. Macdougald points out: “I think people will remember

MAAS Aviation’s new purpose-built Kaunas facility is fully climate-controlled and capable of accommodating two A321-sized aircraft simultaneously.



An Aeroflot Airbus A321 with a complex floral design looks resplendent in its new livery, skillfully applied by MAAS Aviation’s graphic and paint teams.



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when paint manufacturers took the lead out of their paint about 25 years ago and opacity of various colours dropped to the floor. Fortunately, they have spent years improving their products, and now you’ll be able to put a bright yellow over a dark blue with no loss in colour. It will help reduce the cost of the work for an operator.

“Of course, there’s the continual need to increase safety, but as Richard [Marston] has touched on, painting aircraft is not like the motor industry. One area I’d be keen to see improvement is how long the finishes can last, although it depends on the environment the aircraft is operating in. If it’s the Middle East, it’s getting sandblasted every time it takes off. If it’s the Arctic, it’ll be getting de-iced frequently, and the finish may suffer from chemical damage. But there’s also the philosophy that if it isn’t broke, don’t fix it.

“I think there may well be more automation down the line with robots, although the capital investment doesn’t support the business case for automation here at MAAS for the moment. But it’s something we are keeping an eye on due to our close relationship with Airbus.

“Various technologies are coming down the line, one of which is printing and inkjet printing on the surface of the aircraft. But, again, the outlay for such techniques is huge, and the technology is not quite there yet, as the debate for these ‘dry’ coatings still needs to be explored. It’s like how supercars are wrapped today, so moving away from any kind of wet process. What must be remembered with all of this though, is the main objective is not to make the aircraft look pretty, it’s to prevent corrosion, so any kind of paint finish is an anti-corrosion protection. I don’t think there’s

going to be any significant changes to how we work within the next 10 years.”

Asking Macdougald and Marston if one aircraft can prove more challenging to work on than another, both agreed that Airbus types can be harder to strip than Boeings.

For the former, a full day must be allocated for removing the paint compared to a few hours for a Boeing. MAAS has often painted a batch of aircraft of the same type, which means the docking does not have to be adjusted, saving considerable time. But if swapping from a 737 MAX to an ATR turboprop, the time spent adjusting the docking needs to be as short as possible. Also, if an aircraft has a T-tail arrangement, new set precautions must be in place to ensure the safety of the painters. It’s nothing that the company can’t deal with. It simply means for a few hours, before beginning work on the airframe, a series of complex procedures must be implemented.

With around 5,000 aircraft having been painted by MAAS since the company started, and the capability to paint 11 aircraft at any one time across its five facilities, the impact of COVID-19 was not as great as anticipated by the company. Throughout the period the company received numerous requests for quotes, although the conversion from a quote to actual work did slow down, Macdougald admits.

“Looking ahead I think airlines are going to manage their expenditures much closer and only incur costs that they have to in the latter half of this year and early next,” says Macdougald.

With the rise in cargo operations, MAAS is already looking into this area, says Marston. “Although our main focus is single-aisle narrowbody aircraft, this is something that we can’t ignore. We have painted for FedEx and DHL in the past, and although we have limitations into the size of the types we can accommodate in our paint shops, the potential of painting cargo aircraft, which don’t have windows that need to be masked, means they are no different to painting an airliner, which we do extremely well.” ■



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