



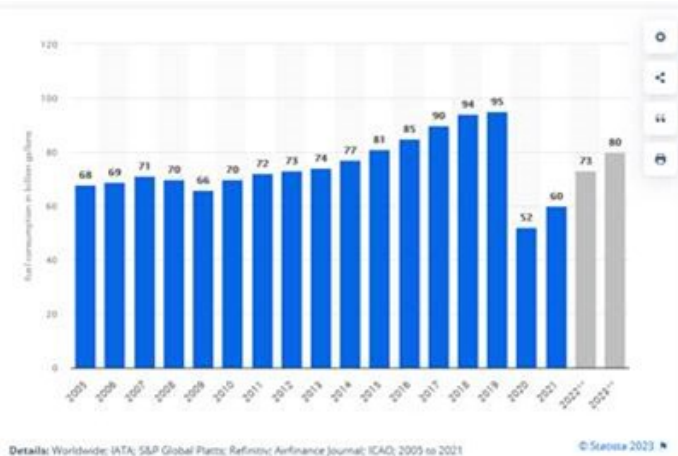
ASRC Staff visit to COMAC and Boeing Shanghai Aviation Services

The CEO and Ms Yandy MA visited the factories of BSAS and COMAC in Shanghai to demonstrate some of the ASRC equipment and seek out new opportunities for co-operation and joint projects. They paid a curtesy visit to BR&T on the final day as well.

Decarbonising aviation: Sustainable Aviation Fuel (SAF) Part 1

Aviation connects the world, 4.5 billion passengers enjoyed air travel in 2019. To run all the passenger and cargo flights, the fuel consumption by commercial airlines reached 95 billion gallons that year, an all-time high for the industry. The consumption dropped due to the pandemic, and the forecast for 2023 is that it is likely to stay at around 85% of the 2019 level, before increasing further in the coming years. To ensure a sustainable future for aviation, new initiatives are nurturing to reduce consumption, but also to reduce the carbon emissions. Currently, the aviation sector accounts for 2.5% of the world's carbon emissions and the industry has committed to achieving net zero carbon emissions by 2050, while the air transport is expected to keep growing.

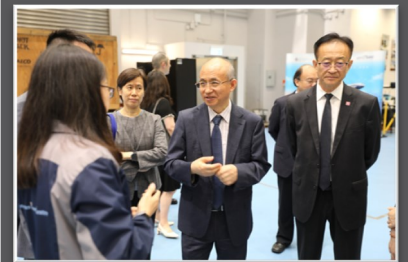
This cannot be achieved alone by replacing all conventional aircraft by electric-powered aircraft, because the power-to-weight ratio obtained using electric batteries is not sufficient yet. As for hydrogen-hybrid propulsion, the technology is currently being tested and implemented on smaller aircraft like UAV's, but a mature technology readiness is unlikely to be achieved before the end of the decade, and therefore all conventional jet engine aircraft will not be replaced before 2050.



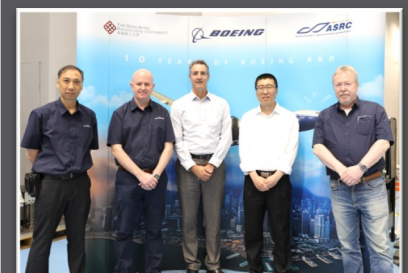
So, how can we reduce the carbon footprint when zero-emission aircraft are not expected for over a decade? This is where Sustainable Aviation Fuel (SAF) comes in the equation. The International Air Transport Association (IATA) estimate that the use of SAF will contribute to around 65% of the reduction in emissions. And just less than 2 months ago, our Partner BOEING has launched their *Cascade* tool which quantifies strategies, enables collaboration on decarbonisation

solutions showing the importance of SAF. Similar to biodiesel for road transportation, SAF is a liquid fuel that can be produced from various sources such as waste oil, municipal waste and crops, or even synthetically by capturing carbon from the air. Compared to fossil fuel, SAF is sustainable because it is using renewable production paths. Although the jet engines will still burn fuel, we speak about decarbonisation because it does not release carbon in the atmosphere which was previously locked away, but rather reuse carbon which was absorbed by the biomass.

VISITS



Academicians of the Chinese Academy of Science visited the centre in May to see how the centre is operated. The visit was organized by the PolyU Mainland Development Office.



Boeing Global Research & Technology staff including BoG Chairman, Dr Peter Li and Dr Scott Walston, VP and Chief Engineer, visited Hong Kong in May. This proved to be a most useful interaction for both sides with two days of most productive meetings.



PolyU alumni with family members

The ASRC played host to a most unusual visit in May as a large number of children accompanied by their parents who are alumni of the University came to the Centre. This was a great experience for staff and visitors alike as opposed to the usual technical presentations, staff had to engage the children and parents in an enlightening and amusing way to instil the curiosity that makes science and technology accessible to all.

History of Machining - Part 1

The Steam Powered Engine

In 1775 John Wilkinson constructed the first boring machine capable of accurate and repeatable bores. This allowed for quality bored cylinders, critical to the steam powered engine and helped drive the Industrial Revolution. Although this is a simple feat by today's standards, it was a phenomenal breakthrough in the eighteenth century. The major stumbling block when developing the steam engine was caused by inaccurate sealing between the cylinder bore and rod. This caused the engine to leak steam which robbed the engine of its efficiency.

The Bridgeport

Bridgeport is a brand of milling machines originally produced by Bridgeport Machines Inc. The first machine began selling in 1938 and is still available today. The Bridgeport is a vertical milling machine with a multi-speed quill in addition to a ram-on-turret mounting over a knee-and-column. This has become a staple of many machine shops when looking for small to medium-sized general milling machines and due to their popularity, machines with the same vertical configuration are often referred to as "Bridgeports". As machines began to innovate the general milling machine

came with some new additions. An X, Y, Z digital readout was added, which has become standard on most manual machines. Also, a servo motor was added to automate the movements and a compact easy to program readout for basic NC toolpaths.



2023 ASRC QMS Audit Report

As the famous Roman Philosopher Seneca the Younger said, '*Errare humanum est, perseverare autem diabolicum*', which can be translated into 'To err is human, but to persist in error is diabolical'. The first internal audit of the ASRC QMS ended in June. All ASRC staff members were involved on the topics they know best to interview their peers. Out of 62 points checked, 21 corrective actions arose. Around half of these will be tackled shortly by implementing process changes or further enforcement of current ways of working to ensure mid- and long-term improvements of our business operations. Most corrective actions relate to the project documentation, tracking and versioning of software, drawing numbering, and management of lifting equipment. In one word nothing major, but as we say, the devil is in the detail!

“ Antoine de Saint-Exupery
French Writer
and Aviator





“4th of July” in Hong Kong

The ASRC CEO, Robert (above left) was invited to the USA independence day celebrations by the Consul General of the United States in Hong Kong (above centre). This is in acknowledgement of the ongoing work carried out by the centre with partners, the Boeing Company.

Good contact with the consulate staff had been established with visits to the centre earlier in the year.

Further to the meetings, more visits will be arranged to coincide with meetings with Boeing staff in the near future.

Gelsight Tactile Sensor Investigations

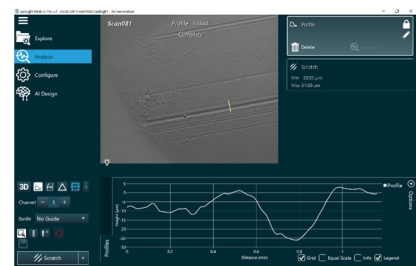


Over the past few months ASRC have been investigating the Gelsight Tactile Sensor. This device is made by a company (Gelsight) who are a spin off from MIT. The sensor uses a tactile gel and a fine illumination technology to faithfully record the profile of a surface that it is pressed into contact with.

Tests were conducted on various components in the ASRC and with the assistance of ASRC members locally and in Shanghai. The device has a resolution in the micron

range and is very repeatable. A versatile software suite enables an impressive level of customisation and an AI learning option gives the device the ability to make smart go/no go decisions.

It is very simple to use and durable.



BSAS and COMAC

Staff from the ASRC travelled to Shanghai to meet with BSAS and COMAC in early July. When there, they demonstrated the ASRC surface scanner and the Gelsight tactile surface feature instrument probe. The local staff were pleased at the proactive nature of the ASRC and were very keen to further cooperation and take part in trials of the technology.

The airplane has unveiled for us the true face of the earth.



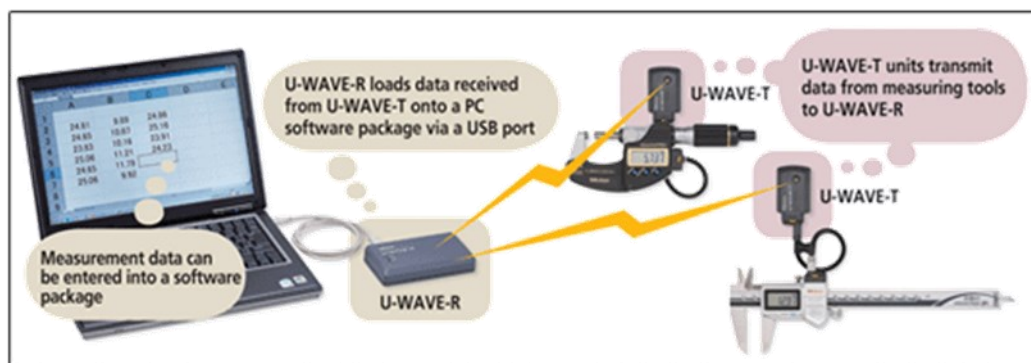


Some thoughts from the ASRC CEO, Mr Robert Voyle

Now that the pandemic is officially over, new challenges face the aviation industry preventing it from fully returning to pre pandemic levels and reaching the previous growth targets set out. These come in the form of shortages in skilled staff, problems within supply chains and growing costs due to outside pressures. Getting closer to agreed sustainability goals is a new area that must be factored in. Obviously these are multi-layered problems, but ones in which the adoption of the latest technologies will certainly help to address some of these or at least reduce the impacts and risks.

According to estimates, the Asia Pacific region is still expected to achieve around 2.5 billion passenger journeys per year by 2040. Which represents significant sector opportunities across region. So now really is the time to invest in new innovations and technology to ensure the sector achieves its sustainability commitments and growth. Where the engineers at the ASRC are primed and positioned to assist in achieving these goals and ambitions.

Digital Gauge to eDrawing

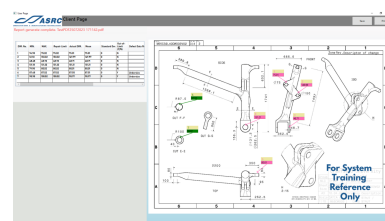
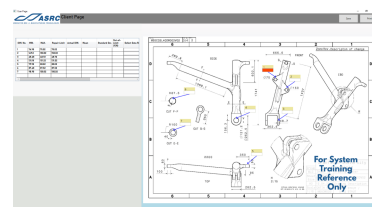


MODEL 02AZD810D MODEL 02AZD730D

No. UWC-001
IP67 Cables \$89.50
Fits All Mitutoyo
Micrometer, Calipers,
Indicators and Other
Tools with Output Capacity



A number of companies manufacture micrometers and other gauges with 'blue-tooth' connectivity capability. Here at the ASRC we are using these gauges to send readings directly to drawings for the remanufacture and repair concerns in MRO and beyond. We have created an online platform which allows engineers to customize any drawing or reporting document to accept readings from the gauges with options for creating an average of a number of readings or a go/no go colour code or standard deviation or indeed any feature that would normally be used on the drawing or reporting document. This greatly reduces the chances of miss reporting measurements. At present there is great interest in this from members and we hope to leverage this to offer a customization service to others.



HAECO Group Annual Dinner



The HAECO annual dinner recommenced after a three year hiatus and ASRC staff were there to help celebrate the resumption of normal activities.

A big thank you to the HAECO management team for a splendid evening's entertainment.

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