

THE Connector

BUILT-IN QUALITY PHASE 2

Gary Northway - Head of Quality, FGP Systems & FGP Lufton

The next phase of our Built-In Quality (BIQ) project is to fully embed Statistical Process Control (SPC) by systematically collecting, analysing and reacting to manufacturing data to give not just part repeatability but machine capability. This evolution in our organisation brings with it efficient processing, reduced waste and ultimately improved business performance by controlling the natural process variability at source. There are three requirements that must be met for us to have Built-in Quality:

The process will be designed so that it is always possible to make a defect-free product. We need to ensure that every step is armed with some basic characteristics to make "Don't make a defect" a reality:

- Equipment and Processes capable of producing the product to spec
- Tools and Environments suitable to the product/process
- Appropriate and Effective Training

To reinforce the points above we have now developed and implemented a live, fully integrated SPC program into 2 key areas of the business.

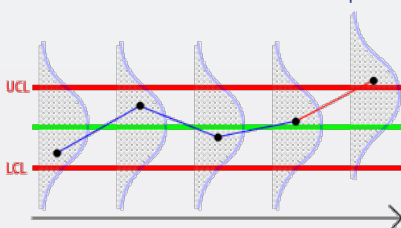
The program is initiated by the quality team working in collaboration with our engineering teams to review drawings and specifications and identify key manufacturing characteristics. These are either classified by the customer as critical features on the drawing (KC), or they have been identified by us internally to specifically target significant tool paths & high precision features.



Inspection plans are then formulated to identify these key features and control the method and frequency of inspection. Equipment with valid Repeatability & Reproducibility studies (Gauge R&R) are selected for the measurement of these features – when analysing data we need to be certain we are looking at variability off the machine and not the checking method itself.

With this information to hand we can then get to the sharp end of the project - the features are measured, and the data placed live into our SPC software. This then plots in real-time the data, automatically setting control limits and alerting the engineers if any point is going out of control, proactively identifying process shifts before a defect is even produced.

- Dramatically reduce variability and scrap
- Scientifically improve productivity
- Reduce costs
- Uncover hidden process personalities
- Instantly react to process changes
- Make real-time decisions on the shop floor



1. **Build Quality right at the source.**
Enable the process to produce a defect-free product every time.
2. **Allow the process to be stopped**
when defects are identified midstream.
3. **Do NOT rely on independent inspection teams** to catch defects when it's too late.



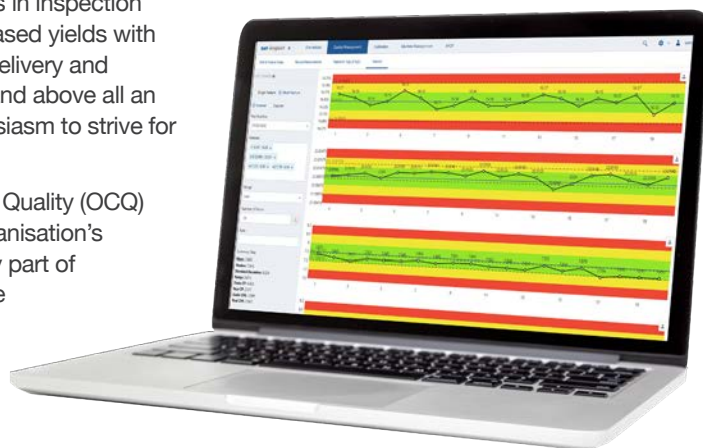
BUILT-IN QUALITY - PHASE 2 CONTINUED

In addition, capability studies off our machine using the data collected can now close the loop and feedback to our engineering team our true machine capabilities and ensure we have the right parts on the right machines.

Staff have fulfilled and continue to undergo training to support the development with the tools, techniques and new measuring systems that this initiative has yielded. It has proven very fruitful in knowledge and learning for all of the staff involved.

We have seen reductions in inspection times (up to 95%), increased yields with which come sustained delivery and company performance and above all an extended lease of enthusiasm to strive for perfection.

Our Operator Controlled Quality (OCQ) initiative furthers our organisation's principle to make Quality part of our DNA; it is the way we do business.



LET'S BE READY FOR TAKE OFF!!!

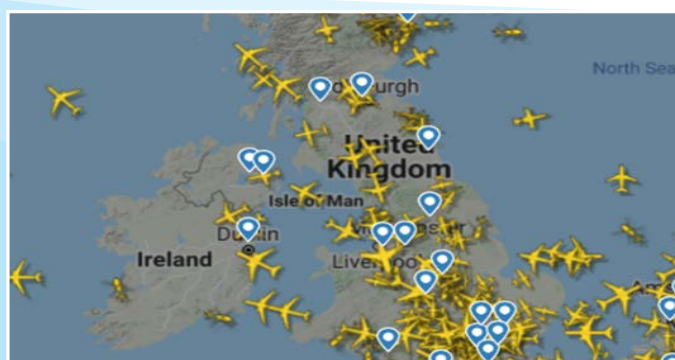
Ian Rowe - Commercial Director

After 7 long months of adapting and adjusting on a daily basis, where prior to COVID our only experience of panic buying was last orders at the bar, we are still in relatively unknown territory as regards to what the future of the Aerospace business will hold.

One thing is for sure, its not a case of will the Aerospace business ever recover, but when will it recover.

Whilst we could possibly be 18+ months away from returning to 2019 /2020 Q1 levels of business, the Aerospace business is still busy recalibrating since the onset of COVID.

But it really is not all bad news, there are some real positive trends within the market.



Commercial Aircraft demand 2020 - 2039

Aircraft Type	Seats	Total Deliveries
Regional Jets	<90	2430
Single Aisle	>90	32270
Wide Body		7480
Wide Body Freighter		930
	Total	43110

- 18th Oct saw 1 Million+ Air Passengers in the US in a day / 40% of 2019 levels.
- Commercial Aircraft revised forecast predicts 43,110 A/C by 2039 (25,900 today).
- Airbus has still delivered 341 A/C YTD with 57 A/C in September (300 Single Aisle).
- Airbus has a backlog of new A/C at 7441 v 7133 A/C this time in 2019.
- Regional / Single Aisle A/C demand prevalent as short haul will recover earlier.
- Business Jet usage is strong with Sales forecast to recover mid-2021.
- The Tempest Program (Next Generation Combat Jet) will support 20k jobs.
- Defence spending is still holding up as security threats continue to intensify.
- UK Customers look to Localisation of their Supply Chain, not Globalisation.
- Aged A/C are being scrapped and replaced earlier than intended.
- China still plans to build 450 Airports by 2035 (235 today).

Lets make sure we are ready with "Speedy Boarding" to get our Seat when it takes off!!

US Passenger Throughput 2020



Congratulations to Paul Hornbrook and Sam Purnell for recognition of your outstanding GOLD award Kaizen. Our 2 engineers have developed and implemented a successful holding method in support of the SPC project in Unit 2.

This method has standardised the fixturing utilising the holding method from the machine itself, allowing simple and repeatable placement of products onto the inspection equipment – effectively a plug and play system operational by any staff member.

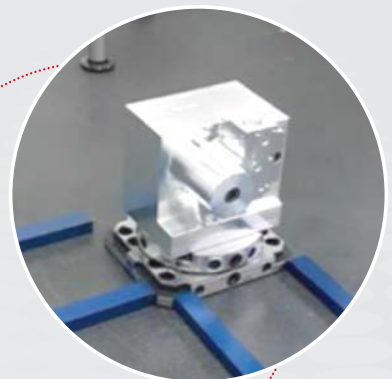
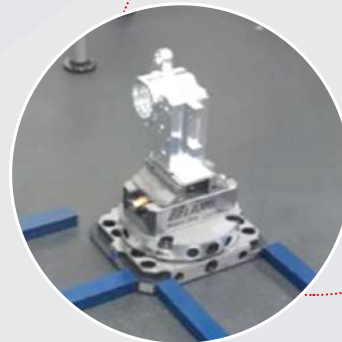
Moreover, should there be the need to modify a part post inspection the product will place directly back in the machine undisturbed from its original seating. This system will be rolled out group wide and is a great example of how engineering, inspection and operations can work harmoniously.

改善

Kaizen

STANDARDISED FIXTURING

- Parts are not removed from the machine vice and placed straight onto positive location on CMM bed
- As product is not removed from machine fixture alterations can be made uninterrupted to the product
- Standardised fixturing in the CMM allows all trained operators to present and check parts 24/7
- Inspection time has realised reductions of up to 90%
- Operators can release their own work under OCQ guidelines (Operator Control of Quality)



SUPERFINISHING



Jordan Darby - Technical Sales Engineer, FGP Systems

STEPPING UP TO THE MARK

FGP Group are pleased to announce a chrome and carbide superfinishing capability across sites.

In response to a key customer's request following failures in the supply chain, FGP Group have successfully implemented the new process at Systems and Lufton.

THE PROCESS

Superfinishing is a refining process that improves surface finish and workpiece geometry, which in turn reduces contact stress and increases power efficiency. This process is carried out by our operators using either fine wheels or felt pads, depending on the surface coating.

Chrome plated components are superfinished at Systems using a CNC Studer S30 following an extensive clean out of the coolant system, to mitigate the risk of flecking. Tungsten carbide coated parts are processed at Lufton using felt pads and fine paste on specialised superfinishing equipment.

Both methods are thoroughly inspected under 100x magnification to ensure strict customer criteria is met. Due to the high performance and critical nature of the parts, each and every component must be checked and signed off by an inspector.

MITIGATING RISK THROUGH COLLABORATION

After securing a long term agreement for superfinished pistons, the process was initially sub contracted out to an external company. Although the service & performance were excellent, the natural risk of single point manufacture remained.

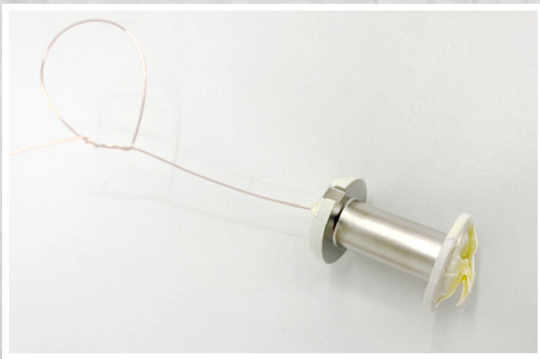
Since the introduction of superfinishing at FGP Group, future demand will be shared between the two businesses. By sharing knowledge, expertise and experience, together we can ensure continuous delivery of product to customer.



ANOTHER SUCCESS STORY FOR THE GROUP

Derek Smith - Operations Director, RSC

SOLUTION MANUFACTURING + ELECTROSTATIC SPRAYING



SPECIFIC COATED PARTS:

RSC carry out the application of Electrostatic Coating of Dielectric Electrical resin for a wide range of Aerospace customers on electrical bobbins and componentry. RSC also 100% test the parts for conformity prior to release. The process employs charged particles to more efficiently coat a workpiece, its ability to coat rounded surfaces and angles allows itself as a preferred option to wet painting. The equipment shown uses a high voltage electrostatic charge which is applied to both the components and the application equipment, this provides limited waste, as the powder is attracted by the charge to form a 'Wrap around' effect.

On Cure at between 170-200 degrees, the powder bonds to the substrate, coalescing into a smooth, continuous, uniform and thick coating. The RSC Coatings are used for insulating armatures, stators, buss bars and toroid cores to name a few.

Group will continue to ensure that this success is shared and customers become more aware that the 'Single Solution PO' is the way to a quicker more efficient result.

Group were recently awarded a two large manufacturing and coating order from a UK supplier who in turn, supply both Aerospace and Defence, this allows the customer to cut just 1 purchase order. The Supplier, in this case FGPS, has total control of procurement of RAW material through to delivery of a conforming part ready for installation, a real 'Cradle to grave' story.

This is becoming more and more popular for larger customers who continue to look at supply chain issues, and whose procurement teams prefer to manage a single supplier, it cuts out logistics, risk, lead-times, and more importantly cost.



DUAL PROCESSING THE BLACK ART

Derek Smith - Operations Director, RSC

RSC continue on its journey in ensuring dual processing of surface coatings becomes normal practice and a robust service it can offer its customer base. The Industry still has not got an 100% masking material that fits all needs and all processes.

With the market place requiring reduced lead times, cuts in logistics and cost savings, RSC has explored and achieved superb conforming results on many dual processes, which we already offer the customer, these include Anodising and Chromate conversion. This allows the Manufacturing Engineer to finish machining the part, a combination of masking aids is then used to ensure areas of the component are treated with the surface finish requirement, as stated, this eliminates a return to the machine shop for skimming of faces to allow chemical conversion, saving time, logistics, and cost.

Whilst there are still challenges ahead to overcome the whole range of surface coatings dual treatments, RSC are well ahead in ensuring we maintain at the forefront of advancing technology, and offer our customer base the best service in both Cost and Quality.



RECENT NEWS

Congratulations!

Kerry Weaver
and partner on
the arrival of
their baby girl

Bethany Cuff
and partner on
the arrival of
their baby girl

Mr and Mrs
Mee on their
wedding

Matthew Greening
and partner on
the arrival of
their baby girl



Congratulations
to Lee Spalding
for completing
25 years' service



Well done to Richard Corvinus
for passing probation (RSC)

Thank you for everyone's
continued support during
these challenging times

TRAINING CENTRE NEWS: HOME STUDY

Andy Johnson - Apprentice Supervisor, FGP Systems

Back in February we could not have imagined the events that were about to unfold. Not least the development of a whole new set of skills, home schemes of work, Zoom Groups and Microsoft Teams.

However, here we are 6 months later and there is no sign of returning to what we once knew as the norm. Our apprentices have learnt different skills and embraced new technologies. All lessons for our 2nd years are now online using Microsoft Teams and Group folders are set up for our Apprentices to access their learning materials.

A challenging time for Apprentice's and teachers alike...

Challenging at times with slow internet speeds, access to the right technology, organising and saving work, keeping motivated and occasional interruptions.

Not to mention online safety and security.

Then there is learning styles to consider, not all our apprentices will be engaged in the way the lecturer thinks they are, the challenge is to overcome the difficulty with interaction online, which tends to be less animated and a little stilted

Our Apprentices liken it to a pod cast where your attention can drift and you have feelings of being remote with less opportunity to engage with your classmates.

Our 3rd and 4th year Apprentices still have to attend college one day a week as normal, albeit social distancing. They are completing workshop Level 3 Advanced Milling, Turning, Grinding, Gear cutting and Engineering Principles.

You cannot do it all remotely.

We are all learning from these Experiences...



SECRET SEVEN



Yvonne Mullen
Group financial
Controller, FGP Group.

Favourite 90's show?

Gladiators

First Job?

Working as a shop assistant in a greengrocers at 14.

When you're not working, how do you spend your time?

Mostly spend it looking after my four kids but if I get a spare moment, I like watching rugby.

Favourite subject at school?

Art

What is your hidden talent?

Can make a decent birthday pinata cake. Do not ask me to cook anything else, it ends up in the bin.

Something you say you'll do, but never do?

Go to the gym

What is the best fancy dress costume you've worn?

Zombie for Halloween

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