NC Programming Solutions for the Aerospace and Automotive Industries

LMg Solutions

Bridgend Office
Number One
Waterton Park
Bridgend
CF31 3PH
United Kingdom

+44(0)1656 668806
+44(0)1656 674 115

Leighton Buzzard Office
Unit P, Cherrycourt Way
Leighton Buzzard
Bedfordshire
LU7 4UH
United Kingdom

+44(0)1525 383917
+44(0)1525 383937

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AEROSPACE WALES

LMg Solutions

www.lmg.co.uk nc@lmg.co.uk Follow us on Linkedin

LMg Solutions was established in 1995 as a specialist provider of Numerical Control Part Programs for Multi Axis Machine Tools, specialising in the manufacture of machined aerospace and automotive components. Operating as a seamless extension to your existing engineering resource, we work in partnership with your team to effective solutions, whatever the size of your project.

Programming for OEM's and their partners on a wide range of engineering projects has provided LMg Solutions with a vast array of knowledge, experience and the ability to meet precise and diverse client expectations and requirements.

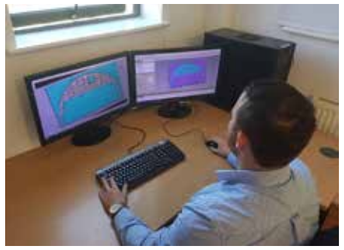
By continually assessing emerging techniques and technologies, investing appropriately in people, systems and training, we offer a flexible and adaptable service enabling us to overcome the most demanding aerospace and automotive projects.

Many of our clients request highly skilled contract and permanent personnel to add value to their company or simply to cover a short fall in their project's resources. LMg Solutions supplies a world class recruitment service providing the engineering resources you need for your team.

With the knowledge we have gained through many years of in-house and on site experience and the in depth working relationships we have with our clients, we are the ideal choice for all your engineering needs.

We look forward to discussing your requirements in detail in the near future.

+44(0)1656 668806 **www.lmg.co.uk** **nc@lmg.co.uk**



CAPABILITIES

At LMg Solutions we continually review and upgrade our technology infrastructure. Our in-house capabilities include the latest and previous releases of major systems:

Current CAD/CAM Software

- CATIA V5 Design / Multaxis manufacture
- Siemens NX Design / 5 Axis Machining
- OPEN MIND HyperMILL 5 Axis Machining

Verification Software

- Vericut / Multiaxis/Machine Sim/Autodiff/CatV5
- Vericut Force

Post Processors

- NCCS PWorks Multi Axis
- IMS-Post
- GEN4AX

Legacy CAD/CAM Software

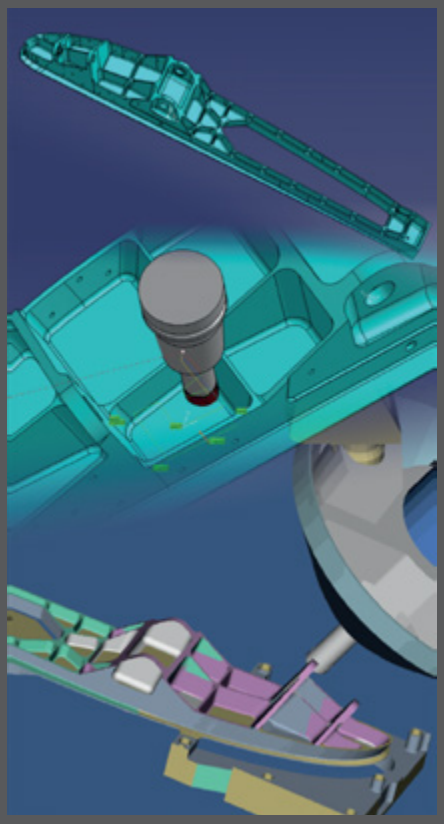
- CATIA V4 MFG & NC Mill
- ANVIL 4000
- APT140
- EdgeCam
- NCL
- Verimetrix

Engineering Services

- Multi Axis NC Programming
- Optimisation through introduction of new technologies.
- Verification
- Post Processing Development
- Reverse Engineering
- 3D CAD Modelling
- Jig and Fixture Design
- Concurrent Engineering
- On-Site Engineering Services

NC PROGRAMMING

From our involvement in a diverse range of projects for Europe's leading Aerospace Companies we have gained invaluable experience in providing quality, highly effective part programming solutions.



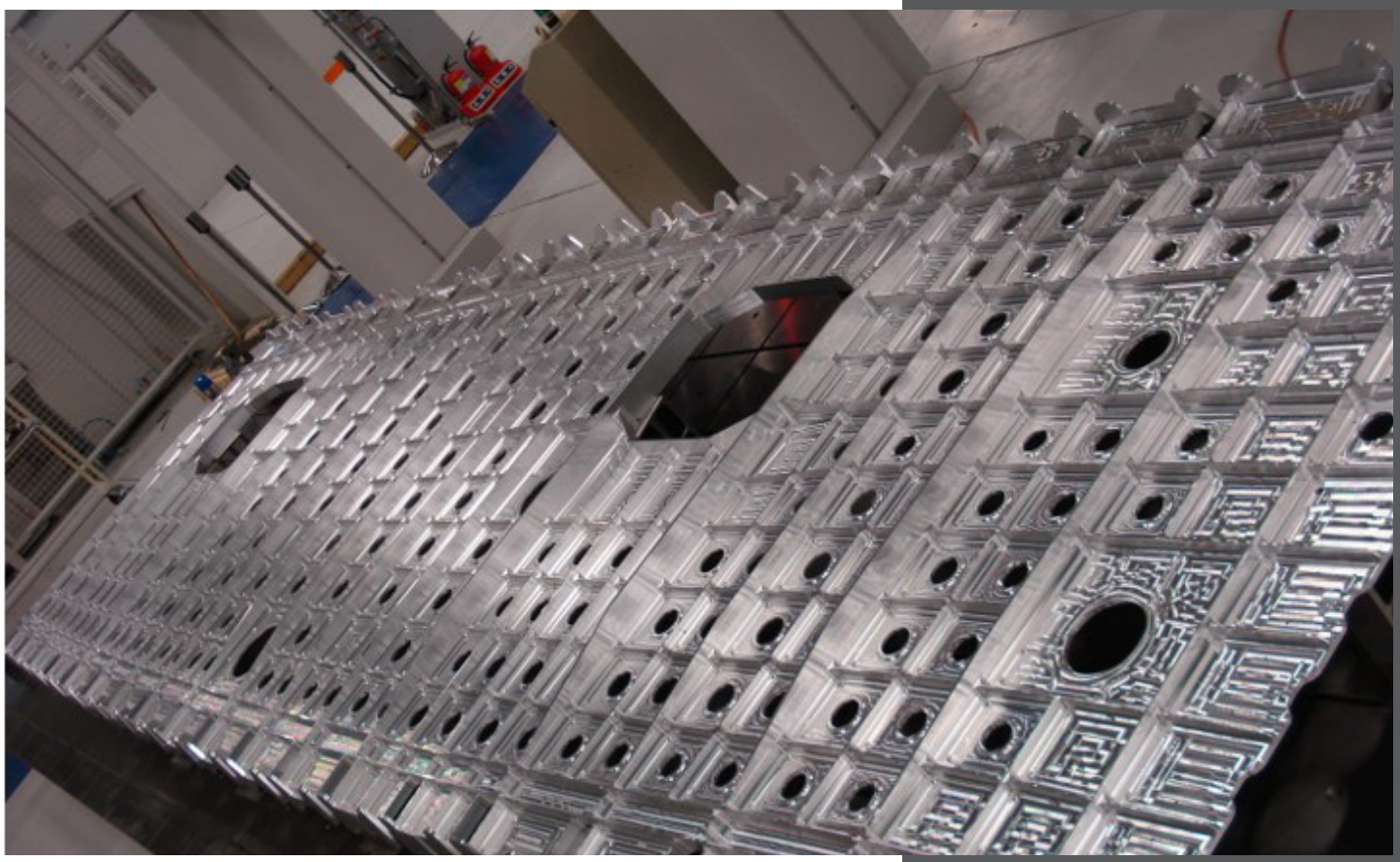
Using the latest technology and adaptable programming techniques, we are able to produce NC Part Programs for most NC/CNC Machines and Control Systems.

- 2½ through to Multi-Axis
- Conventional and High Speed Machining
- Parts from small prismatic to the largest airframe assembly
- All Materials

We possess an in depth working knowledge of the Aerospace and Automotive sectors, from a workforce which has gained unparalleled technical expertise. This leaves us perfectly placed to understand our clients' requirements and provide an industry leading cost effective solution.

LMg Solutions is particularly effective where,
- there is a short-fall in your project's NC Programming resources
- the project's technical requirements exceed in house capability
- you wish to extend your team using highly skilled personnel

Delivering engineering support for both short-term, tactical off load and longer-term strategic partnerships.



OPTIMISATION

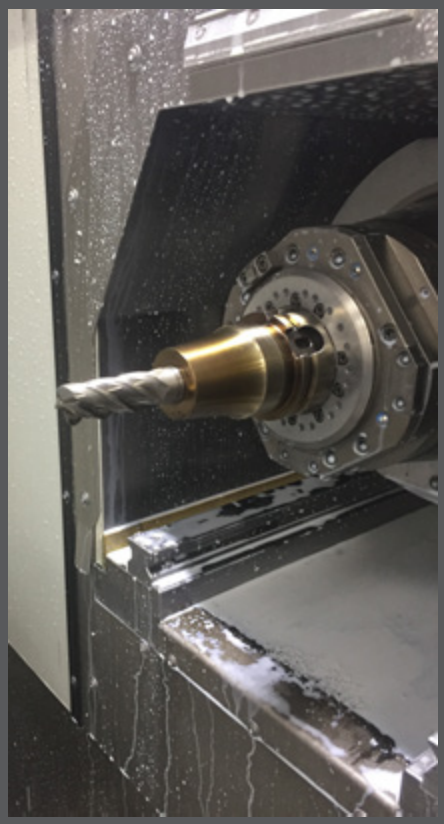
Through Introduction of New Technologies

Optimisation can be achieve in many different ways and does not necessarily mean using new technology machine tools.
LMg typically consider optimisation into two categories: -

Full optimisation:
- New technology machine.
- New technology cutting tools & development of cutting strategies.
- Order of magnitude cycle time reduction can be achieved.

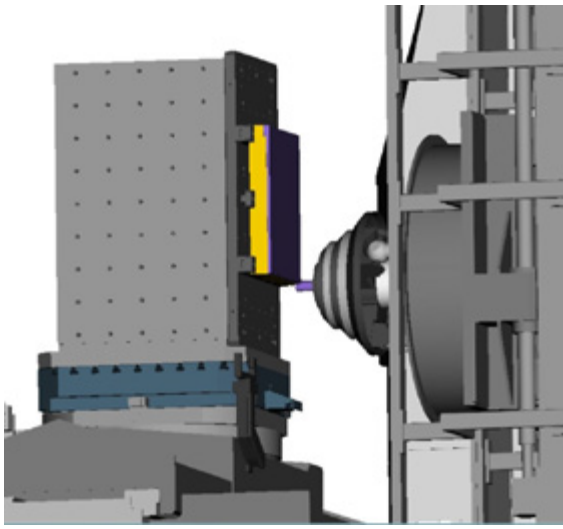
Partial optimisation:
- Old technology machine,
- New technology cutting tools & development of cutting strategies.
- Typical cycle time savings achieved between 25% & 40%

LMg Solutions work in partnership with leading Machine Tool and Cutting Tool manufacturers developing more efficient strategies using new technology machine tools, new technology cutting tools resulting in reduced cycle times and typically improved quality. LMg's roll is defining the methodology and the development of the cutting strategies but also considering work holding.



VERIFICATION

Prior to delivery, each NC part program undergoes a rigorous and detailed verification process. For this we use CGTech Vericut and Vericut Machine Simulation.



Vericut Multiaxis Machine Simulation

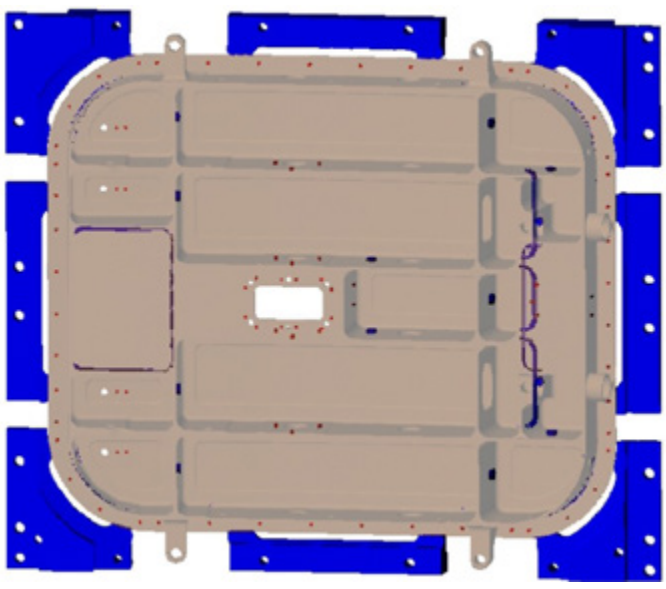
VERICUT software simulates CNC machining so to be more efficient, more competitive, and more profitable! A machine crash can be very expensive, potentially ruin the machine, and delay your entire manufacturing schedule! But with VERICUT, we can dramatically reduce the chance for error and avoid wasting valuable production time proving out new programs on the machine. CNC Machine Simulation detects collisions and near misses between all machine tool components such as axis slides, heads, turrets, rotary tables, spindles, tool changers, fixtures, work pieces, cutting tools, and other user defined objects. It can set up 'near miss zones" around the components to check for close calls, and even detect over travel errors.

Vericut Model Interface

Model Interfaces enable VERICUT to read the designated model file formats and use them as stock, fixture, design, tool holder and machine models. When combined with Model Export, VERICUT's cut stock may be written out in these formats as well. The modules do not require a CAD/CAM system be available for VERICUT to read or write any of the formats.

AUTO-DIFF

AUTO-DIFF enables us to compare a CAD design model to a VERICUT simulation to automatically detect differences. Using this module, anyone involved in the production process can identify incorrectly machined areas. AUTO-DIFF is also used to detect a possible weakness or mistake in the design.

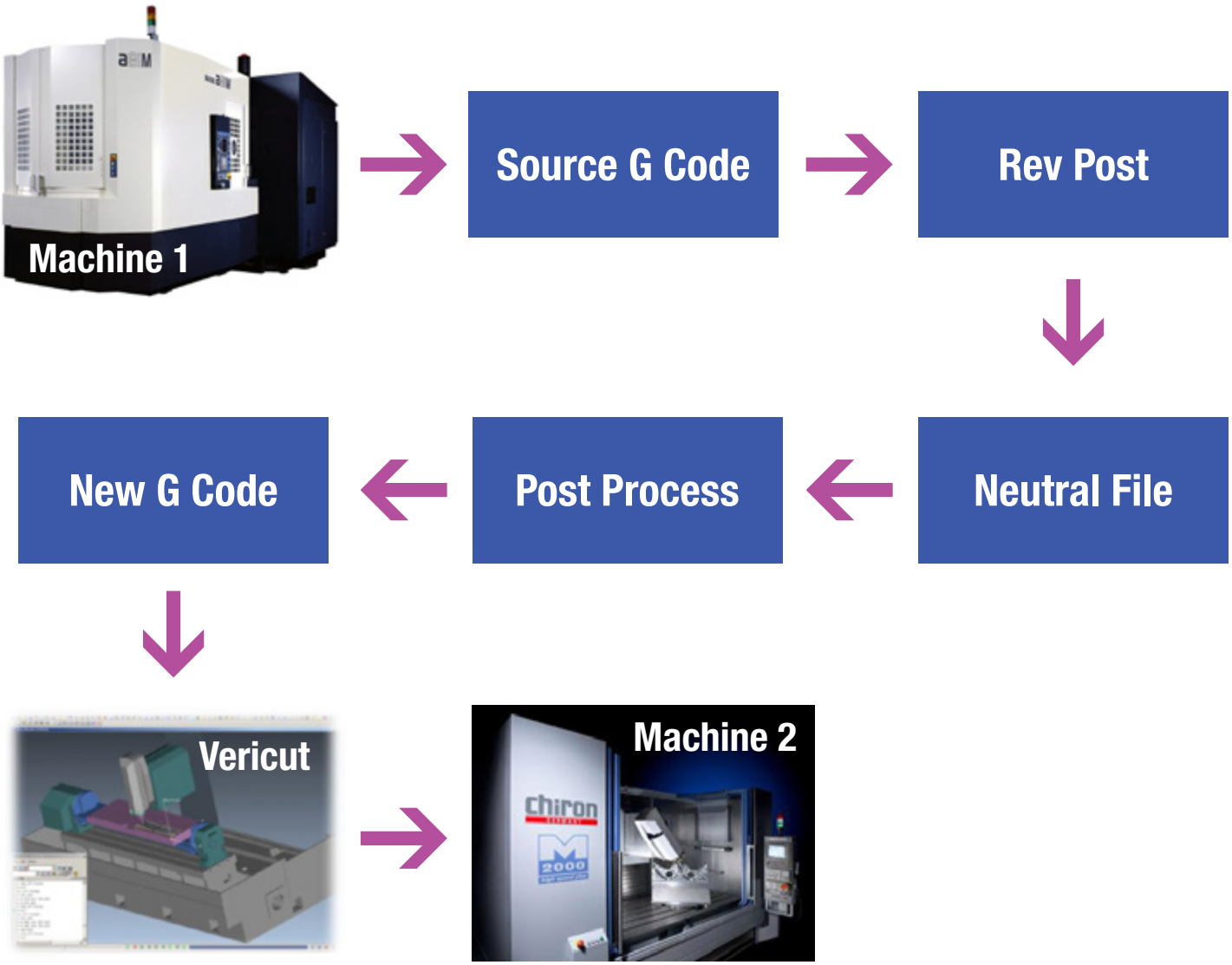


POST PROCESSORS & REVERSE ENGINEERING

Post Process Development
NCCS PostWorks is a universal 2 - through to 10 - axis postprocessor. It can convert output from most major CAM systems into NC data files which can be used to run virtually any NC Machine.

IMS-Post is the most advanced postprocessing software that transforms CAD/CAM cutter location (CL) files into the specific (G/M) codes required by NC machines.

Reverse Engineering
Combining our CAD/CAM Systems, Vericut and our Postprocessors we are able to convert G Code files from one machine to another allowing the customer to use their existing Proved Part Programs to be used on other machine tools.



3D CAD MODELLING

Paper to 2D CAD.
Paper to CAD is a procedure for converting Paper Drawings into 3D CAD Models and/or 2D Drawings. Companies often only have libraries of individual parts which were created prior to CAD and only have the paper drawings.

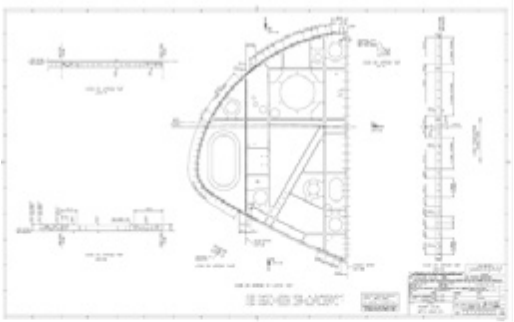
2D to 3D Conversion.
Using the same process as creating the 2D CAD Drawing we will then create the 3D Model. There could be many reasons why this would be required such as updating existing stock drawings into modern 3D format or create a high quality 3D Printable format.

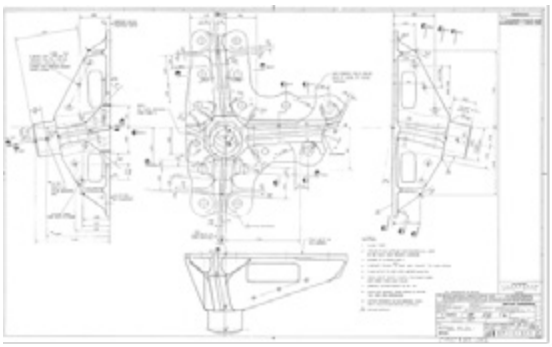
Manufacturing Drawings
We can produce full manufacturing drawings for parts that are to be machined. The drawings would include the Material Specifications, Linear and Angular Dimensions, Geometric Tolerances, Surface Finishing Type and tolerances.

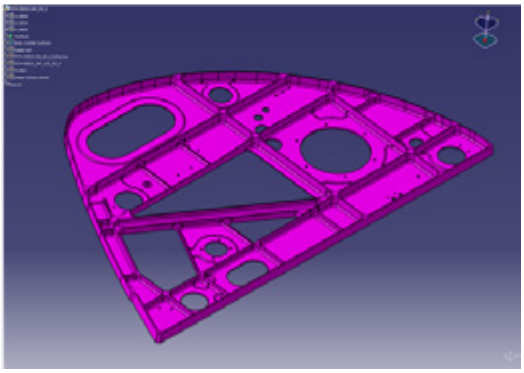
Assembly Drawings
Depending on the complexity, Assembly Drawings are often structured into a Top Level Assembly and also Sub-Assemblies. This is to give more clarity on the full product. Assembly drawings should include all Sub-Assemblies, all parts to be manufactured, all parts introduced including specific part numbers, fixings, and bill of materials, (BoM).

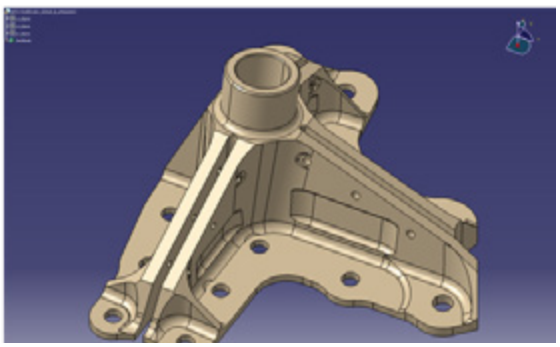
Verification
All drawings are independently verified after completion.

If an existing manufacturing process is available this can be Vericut to produce a model file then an AutoDiff check can be performed to validate the new model.





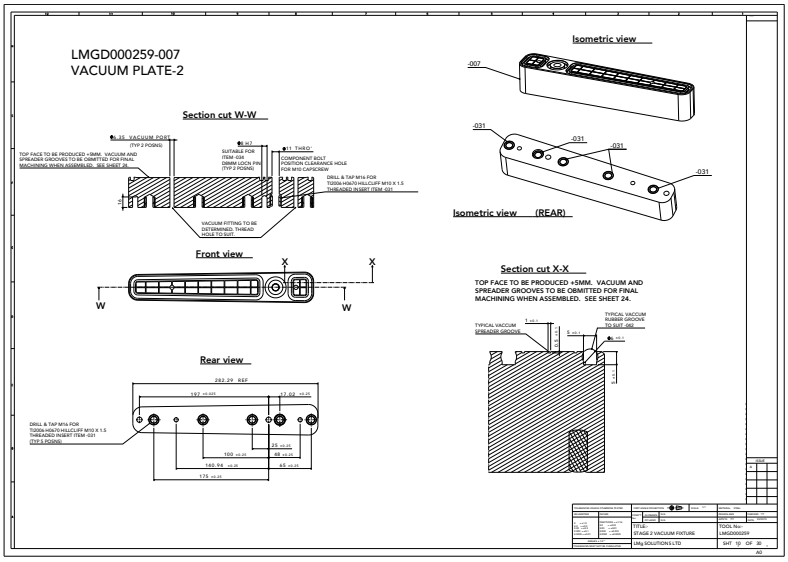


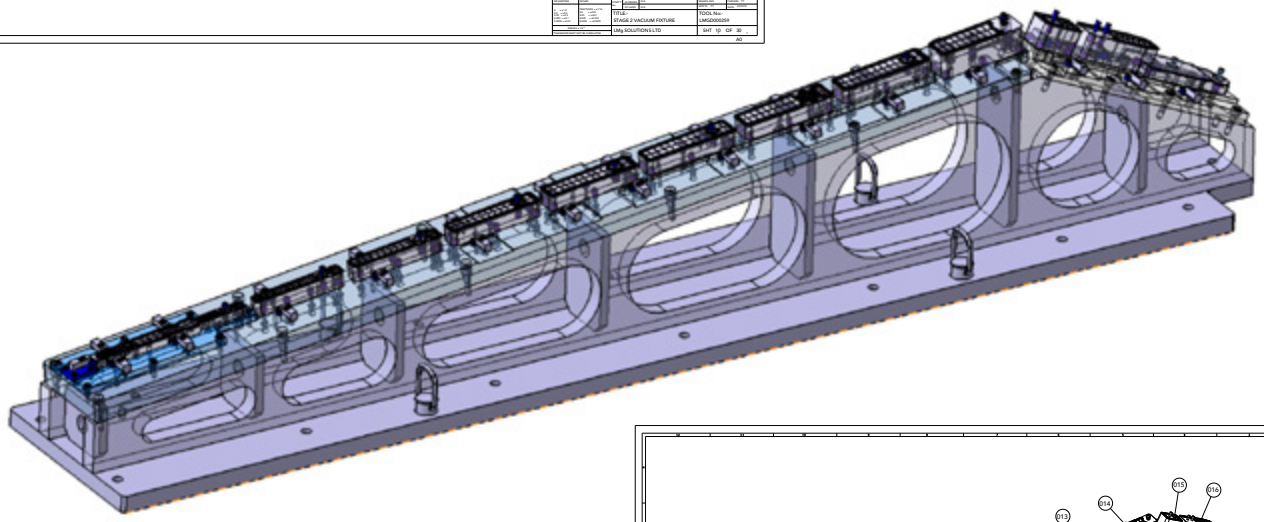


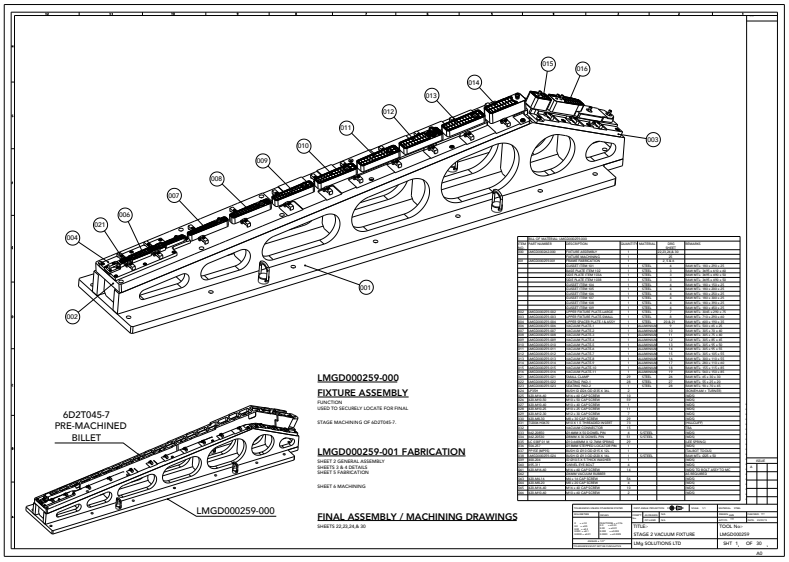
Jig and Fixture Design

Jig and Fixture Design

We believe that our ability to offer a highly skilled in-house design service makes us unique. Our team of designers uses the latest 3D design and solid modelling techniques to create bespoke workholding solutions tailored to meet the demands of a wide range of applications. We specialise in the design of jigs and fixtures using both manual and CNC techniques. We will work with you to develop the right solution for your bespoke requirements and budget: whether you are looking for a simple manual fixture or a complex vacuum fixture.







Aircraft Projects

Airbus A300
Airbus A310
Airbus A320
Airbus A330
Airbus A340
Airbus A350
Airbus A380
Airbus A380 Freighter
Airbus A400M
Airbus Super Guppy
Boeing 737
Boeing 747
Boeing 767
Boeing 777
Boeing 787
Bombardier C Series
Bombardier CRJ Series
Embraer E170
Embraer KC-390
Embraer Legacy
EH101
Eurofighter Typhoon
F-35 Lightning
Hawk
Honda Jet
Mitsubishi Regional Jet
Nimrod
Phantom
Pilatus
Super Lynx
Tornado

And many more!

Portfolio


Airbus Deutschland GmbH (Germany)


Airbus Operations (UK)


Aviation Services Research Centre
Hong Kong Polytechnic University (HK)


Bae SYSTEMS (UK)


Bentley Motors (UK)


Carl Zeiss SMT GmbH (Germany)


Consur SA (Spain)


DS Technology GmbH (Germany)


EADS Deutschland GmbH (Germany)


EMBRAER (Brazil)


EMBRAER (Portugal)


EPI (UAE)


Gardner Aerospace (UK)


GE Aerospace (UK)


GKN Aerospace (Germany)


GKN Aerospace (UK)


Hyde Group (UK)


J W Kane Precision Engineering Ltd (NI)


Magellan Aerospace (UK)


Mechachrome Technologies (Canada)


Moyola Precision Engineering (NI)


NCMT Ltd (UK Makino Distributor)


Northern Aerospace (UK)


OMNI Aerospace Inc (USA)


Orizon (USA)


OulunHienomekaniikkaOY (Finland)


Patria Aerostructures OY (Finland)


Premium Aerotec GmbH (Germany)


RLC RONALDSWAY (I.o.M)


RUAG Aerospace (Switzerland)


S.A.B.C.A (Belgium)


SICAMB Spa (Italy)


SPS Aerostructures (UK)


Starrag AG (Switzerland)


Starrag Technology GmbH (Germany)


UAC Europe S.R.L. (Romania)


Zodiac Aerospace (UK)