



Polymer Engineering

Technology at work for you



Goudsmit UK is part of the Goudsmit Group of companies based in Eindhoven, the Netherlands. Founded in 1960 the group manufactures and supplies a range of products from components through to capital equipment. The group has subsidiary companies across Europe and into Asia.

Goudsmit UK was founded in 1998 and specialises in the design, industrialisation and manufacture of custom industrial components. The company can also design and sub-contract manufacture entire products and offers a comprehensive and global logistics service.

TS16949 and ISO9001 qualified, the company works in a wide range of market segments including Automotive, Oil and Gas, Aerospace, Medical Devices and Green Technology.



Logistics

Designing, industrialising and manufacturing components are only some of the issues which face us and our clients. Just as important is getting the correct number of components to the correct place at the right time. To do this we have a refined and complex logistics network which operates throughout the globe. Key capabilities of this network are:

- Demand planning system to predict and manufacture client requirements
- Frame contracts with multiple drops spanning up to 2 years
- Warehouses in Holland / USA / UK to allow ex stock delivery
- Buffer stock held locally to offer 3 day delivery
- Consignment stock capabilities
- JIT delivery for automotive volumes
- KANBAN delivery for regular use items
- Global tracking system to monitor orders and parts through production and shipping

We have adapted our logistics network to match the dispersed and global nature of our clients operations and can offer whatever service our clients require.

For further information please refer to our logistics brochure.

Quality Assurance

What our clients want are parts which are correct first time and every time. We endeavour to provide this and our QA aim is zero defects on deliveries and continual improvement in all our processes. In order to achieve this we have become TS16949 and ISO9001 certified and are constantly tightening our processes and QA controls to better control our final product. A short summary of the QA tools and documentation we use and can provide is shown below:

- Samples with ISIR submission
- Design and Process FMEA
- PPAP on pre-production parts
- APQP
- Inspection reports with all deliveries
- Polymer composition analysis
- High powered microscopy on polymer structures
- Thermal testing
- Environmental testing

We are happy to provide any custom QA structure our clients require right up to zero defect by measurement.

For further information please refer to our Quality Assurance brochure.

Injection Mouldings

Goudsmit UK specialise in the volume manufacture of thermoplastic injection moulded components. Our specialisation is in the industrialisation of your component to ensure when it is moulded that it is dimensionally and visually right. We offer a wide range of post moulding options and can assemble multiple components to create your final product. Finally we can offer FEA analysis for load and pressure bearing components to advise on how different polymers will perform in an application.

DESIGN / DEVELOPMENT / INDUSTRIALISATION

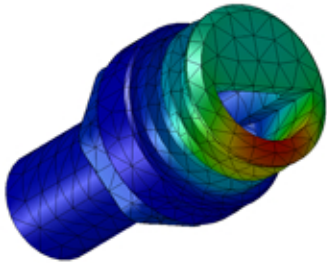
Most companies we work with do not have a plastics specific designer and so we aim to help fill this gap and better industrialise your product. We will take your design and if required provide the following:

- 3D model, 2D tolerance drawings, analysis of fits, addition of assembly features, draft angles, tool finish
- Location of splits, ejector pins, gate positions, date wheels, part number
- Define colour, stability, finish
- Analysis of wall thickness, flow, sinkage



FINITE ELEMENT FOR BETTER DESIGN

For some products mould fill and mechanical performance are absolutely essential. We run a full FEA suite so we can firstly perform mould flow to see how a part will fill and to see if it will sink post injection. Subsequently we can analyze how a part will behave if loaded, for example, with a simple mechanical load or under pressure perhaps in a hydraulic system. We can also perform thermal analysis to identify how the part will react at temperature and how the polymer will perform. By doing this before we begin to make the tooling we can remove the risk that the part will not behave as it should in the target application.



TOOLS FOR THE JOB

Tool design and construction are essential to the successful outcome of any product development. Goudsmit UK maintains, but does not manufacture its tools preferring to leave this to specialists. Tools are however all manufactured to a very high standard and are maintained for free and guaranteed for a million shots. All are made from hardened tool steel. Complex tools are not an issue so slides, rotating cores and hot runner systems are commonly used. Gating is typically sprue but edge, film, diaphragm and tunnel are all possible. For ejection, pins are normally used however sleeve, blade and stripper plates can be used where required. Cooling and venting the mould tool is clearly necessary and is designed by us depending on the complexity of the part being moulded.



WHAT HAPPENS?

To make any injection moulding the first requirement is a 3D model of the component. If that is not available Goudsmit UK can generate the model and our client can approve it. From the model we will indicate cavity numbers, gates, ejector pins, drafts etc. If FEA is required this will be done. A tool will then be constructed and the part can be moulded. These first-off parts will be checked and some modifications might be made to the tool. The tool will then be re-run and the parts again analysed for dimension and appearance. If everything is OK the tool will then be finished by either polishing or texturing the surface of the tool to a given specification. The tool will then be run for a third time and the parts produced will form our initial sample and will be supplied with the necessary QA documentation. Should these pass we can then proceed into manufacture with a pre-production batch and subsequently a production batch. To get to approved samples the process will take anything from 8 to 14 weeks depending on the complexity of the part and the polymer used.

POLYMERS, POLYMERS, POLYMERS

Quite simply there is an astounding array of polymers available on the market today for any designer to choose from. The majority of polymers we use are standards such as Nylons, ABS, LDPE, HIPS and Acetyl to name a few. More exotic polymers are available and we can mould these without issue. In choosing polymers we will assist by looking at environmental factors and mechanical loading and then use a compatibility matrix to define possible candidate polymers. Within certain limits it is possible to trial multiple types of polymer in the same tool and often we will look to direct clients to the best cost/performance ratio material we can find.

We often mould FDA approved materials for the food industry and engineering polymers such as PEEK for very specific applications in high performance sectors such as oil and gas. Polymers can be modified to make them UV stable, flame retardant or filled with glass fibre, bead or talc to alter mechanical performance. Goudsmit UK also manufacture clear products from highly polished tools using polymers such as PC and PS. Furthermore, we can mould rubber materials such as EPDM, silicone and nitrile rubbers and neoprene to name a few.

TWO SHOTS AND INSERTS

As well as multi-cavity moulding for individual components, we also have a range of both vertical and horizontal machines which we run for insert moulding and two shot components. Inserts are typically machined or stamped components made by us and then over moulded with a polymer. We also twin shot mould dissimilar polymers such as a structural part over moulded with a rubber material, for example in seals or castor wheels. Over moulding is an extremely flexible manufacturing process which can provide fantastic results if it is engineered correctly.

FINISHING

There are almost a limitless number of things that can be done to plastic components once they have been made. Currently we do the following:

- Mechanical operations – Annealing of some components to modify their behaviour. Ultrasonic welding, gluing and heat staking of components to allow assembly. Post machining to create very complex features that could not be moulded. Surface finishing to achieve high polish on components.
- Cosmetic operations – Pad and screen printing to apply logos and markings to components. Rubbling, painting and sandblasting to achieve cosmetic finish.



Extrusions



EXTRUSION TYPES

Goudsmit UK can supply the three basic types of extrusion commonly available:

- Flexible – A rubber type polymer is extruded to leave a soft, flexible material to varying shore hardness. These are commonly used as seals.
- Rigid – A thermoplastic polymer such as PVC is extruded and the resulting part has generally good rigidity and retains its mechanical form. Parts can be opaque, translucent or clear.
- Co-extrusion – A rigid and flexible material are run on side by side machines and the extruded material combined in a common die. This leaves a structural part with a flexible attachment. A door seal would be a good example.

APPLICATIONS

Extrusions are mostly used to provide cheap structural components or flexible seals. Typical applications include ducting, piping and trunking. Door frames and seal strips are common uses.

Recently Goudsmit UK has become more involved in the lighting industry and extruded diffusers plus covers can be made to a range of specifications.

Finally, extrusions can also be fitted with self-adhesive strip or even magnetic strip to offer further application solutions.

MATERIALS

Again the range of polymers available is huge but a brief summary is:

- Flexible – Typical materials are PVC which can be modified in several ways. TPE which is a thermoplastic elastomer that comes in a range of grades. We also extrude PVC/nitrile and TPR. Advice can be given on what best suits your application.
- Rigid – PVC is most common. Other polymers are ABS, HIPS, PP, PE, PC, PTEG, PMMA and PS. Materials can be further modified to make them UV resistant and flame retardant. They can be filled in order to modify mechanical properties or to change optical properties.

Foams



FOAM TYPES

Goudsmit UK supplies uniquely polyurethane (PU) foam in a range of different product types. These include:

- Semi rigid flexible foam – A reasonably firm, flexible foam which can be used in varying density for insulation, trim, seating and armrests.
- Integral skin foams – As the name suggests the foam has a full continuous skin around it sealing off the open cell foam structure. Excellent for applications where an impervious coating is required. The tool can be finished to provide a textured part.
- Rigid foams – These have a higher density and can have some structural properties. Uses include insulation, cavity filling and noise reduction. These foams, if highly skinned, are very durable.
- Over moulded foams – These have a component placed in them and the foam is moulded around the component to increase mechanical stability and allow easy coupling to another component.

TOOLING

All our tools are made from aluminium. The moulds are 3D modelled to qualify the design, CNC machined and then finished to provide the required texture. The moulds are relatively inexpensive and highly durable.

WHAT HAPPENS?

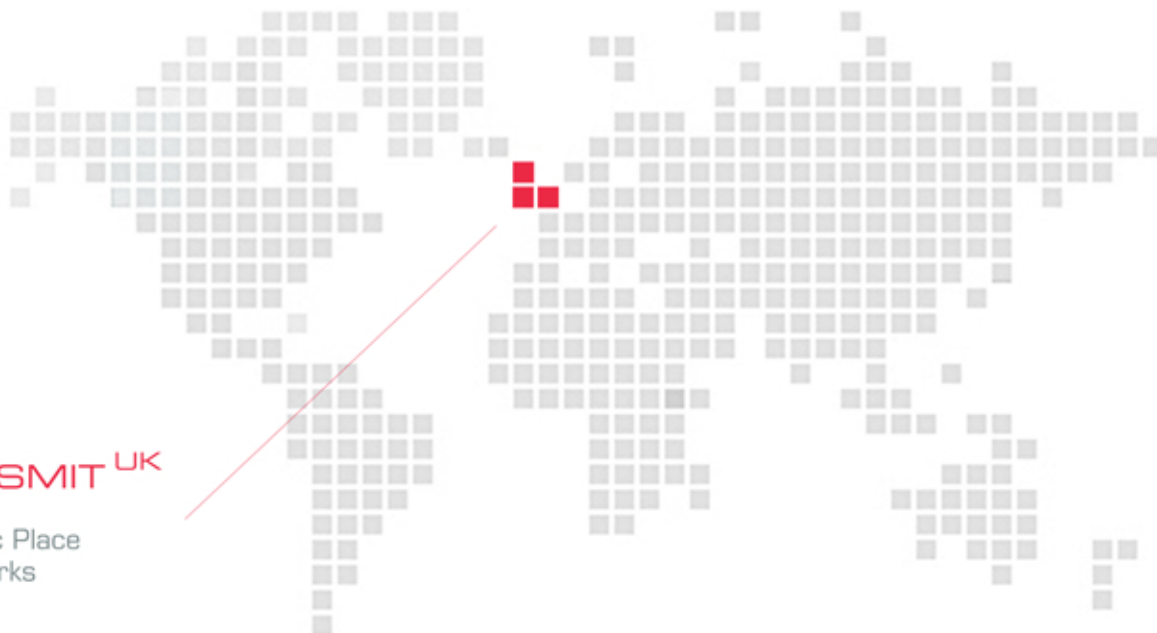
To make any foam the first requirement is a 3D model of the component. If that is not available Goudsmit UK can generate the model and our client can approve it. From the model a tool will be constructed and the foam can be moulded. Various foam densities are available mostly from 0.1g/cc up to 0.4g/cc. Clients will be asked to specify skin type and colour plus any texturing required. For inserted foams we will generally make the insert part ourselves and typically this will be 6061T6 aluminium with anodised finish. Foams may also be split to allow for them to be fitted on pipes as insulation. Colour can be specified as RAL or Pantone. Density requirements for foams can be hard to judge so it is not uncommon to require second samples with a density modification before moving to full production.

APPLICATIONS AND INDUSTRIES

Foams are principally used for insulation, soundproofing, impact absorption, filling and support. Goudsmit UK operates in a range of industries which include furniture, medical aides, plumbing insulation, high performance insulation and automotive industries. Our main goals are high dimensional and density stability for our products and excellent quality finish on visual parts.

Worldwide Service

- Goudsmit UK is part of the Goudsmit Group of companies. With two production facilities in China, one in the Czech Republic and two in Holland, the company has the reach to supply from Asia to Europe and on into the USA



GOUDSMIT^{UK}

10 Cromac Place
The Gasworks
Belfast
BT7 2DH

Tel: +44 (0)2890 271001
Fax: +44 (0)2890 271002
E-mail: info@goudsmit.co.uk

Goudsmit Magnetic Supplies BV
Prunellalaan 14/5582 HB Waalre
P.O. Box 7/5580 AA Waalre
The Netherlands

Tel: +31 (0)40 2219015
Fax: +31 (0)40 2220256
E-mail: supplies@goudsmit-magnetics.nl

Goudsmit Magnetic Systems BV
Petunialaan 19/5582 HA Waalre
P.O. Box 18/5580 AA Waalre
The Netherlands

Tel.: +31 (0)40 2213283
Fax: +31 (0)40 2217325
E-mail: systems@goudsmit-magnetics.nl

Goudsmit Magnetic Design BV
Prunellalaan 3/5582 HB Waalre
P.O. Box 65/5580 AB Waalre
The Netherlands

Tel: +31 (0)40 2212475
Fax: +31 (0)40 2212479
E-mail: design@goudsmit-magnetics.nl

Goudsmit China Magnetic & Plastic
HengJie Industrial Zone
YinZhou District, Ningbo
315181 P. R. China

Tel: +86 (0)574 8827 1206
Fax: +86 (0)574 8827 1205
E-mail: tz@goudsmit.cn

Aimants Goudsmit France s.a.r.l.
Siège social
Z.I. - 3, Rue du Vert Bois
59535 Neuville en Ferrain Cedex

Tel: +33 03.20.28.40.00
Fax: +33 03.20.28.40.01
E-mail: goudsmit.france@wanadoo.fr

Goudsmit Büro Deutschland
Schöllinger Feld 34
D-58300 Wetter
Deutschland

Tel: +49 (0)2335 681906
Fax: +49 (0)2335 681908
E-mail: info@goudsmit-deutschland.de