

SILICONE FOR THE RAIL INDUSTRY
Choose Primasil for the perfect tailored fit



Silicone rubber materials and products

THE PERFECT TAILORED FIT

Primasil Silicones' impressive track record for creating innovative and perfectly tailored silicone rubber products is what makes us Europe's leading independent manufacturer. You can be confident that the materials we formulate will meet your precise requirements.

Our materials can be supplied for use in your own manufacturing process or we can convert them into finished products for you, using our extensive moulding and extrusion plant. Working within rail and other industries worldwide, our

market-leading expertise combined with our quality and service standards, facilities and flexibility enables us to deliver the latest silicone technology and the perfect fit.



AN IMPRESSIVE TRACK RECORD

Precise tailoring

We go to great lengths to ensure the materials we formulate and the end products we manufacture meet your application needs, perfectly. Why settle for just the best available fit?

Expertise

With over 35 years' experience in the silicone market, we have often solved the same challenges your business faces before or met requirements very much like them.

Broad knowledge

By working across a wide variety of industries, we gather and apply best practice principles and leading-edge technologies that will benefit you in the rail sector.

Quality

We were the first independent silicone supplier in the UK to achieve BS EN ISO9001:2008 accreditation, which gives you an insight into our ongoing commitment to providing you with what you need, on time and at the right quality.

Independence

We are free to choose the raw materials that will work best for you, working closely with suppliers to ensure cost-effectiveness and continuity of supply.

All in one

Unlike other silicone rubber manufacturers, we have all of our services under one roof – here in the UK. This enables every element of material formulation and mixing, along with finished product manufacture and development, to be closely controlled and quickly adjusted.

PRIMASIL – THE PERFECT FIT FOR RAIL

We understand that the materials and products you use in rail and mass transportation need to be cosmetically appealing, while at the same time meeting stringent technical and safety requirements.

In particular, there is a demand for materials to be self-extinguishing, with minimal release of smoke and harmful gases when ignited, and to retain their essential physical characteristics over a wide operating temperature range.

A recent innovation resulting from close co-operation with the rail industry has been Primasil's development of Railsil 791/70. The choice of approved silicone materials in this market is very limited. Railsil is the only silicone rubber available in jet black that meets the relevant standards and can be successfully moulded. Better still, this material's unique good looks will not fade.

As well as formulating and mixing the materials your sector needs, we manufacture bespoke extruded and moulded components to your exact specifications. These include:

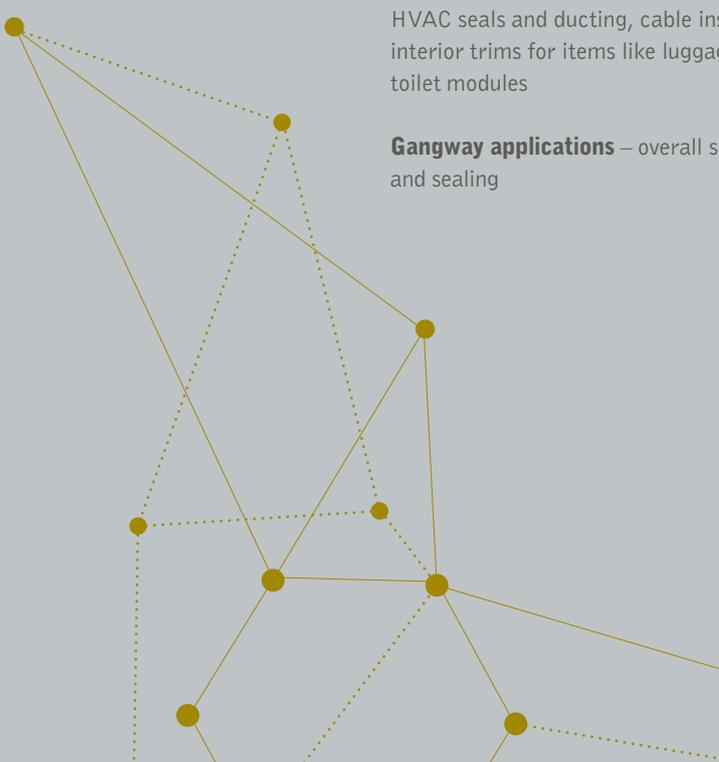
Exterior applications – such as window seals, door seals and door nosings

Interior applications – including floating floors, HVAC seals and ducting, cable insulators and interior trims for items like luggage racks and toilet modules

Gangway applications – overall structure and sealing

Our work in your sector to date has focused on markets requiring low-smoke and low-toxicity materials. We have supplied materials and end products for use on **Bombardier**, **Siemens** and **Alstom** trains, and our previous projects have included:

Victoria Line Underground (VLU)
East London Line (ELL)
Northern Line Refurbishment (NLR)
Sub-Surface Line (SSL)
Crossrail (approval under way)



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MATERIALS

We currently offer three materials with approvals and certifications specifically relevant to the rail and mass transportation sector. In each case we can either supply the material or we can make the components for you on our own premises.

RAILSIL 791/70

A key advance has been our **Railsil 791/70** heat-cured silicone rubber. Vulcanised articles made from this material have a unique combination of characteristics ideally suited to railway rolling stock applications. In particular, their excellent flame-retardant properties are coupled with low smoke and toxicity ratings. Of the few materials to have attained BS 6853 Cat 1a and EN/TS 45545-2 HL3 approval, **only Railsil can be produced in jet black** (RAL 9005).

A more complete list of key approvals for Railsil 791/70 includes:

BS 6853 Cat 1a
CEN/TS 45545-2 HL3
NF F 16-101 Categories F1 & I2
DIN 5510-2
LUL 1-085 A2 Table 4
Fire resistance: UL 94 V0 (3mm)

Physical properties

Test	Standard	Units	Typical values
Density	ISO 2781:2008	g/cm ³	1.24
Hardness	ISO 7619-1:2008	Shore °A	72
Tensile strength	ISO 37:2005	MPa	8.00
Elongation @break	ISO 37:2005	%	400
Tear strength	ISO 34:2004	kN/m	24
Compression set: 22hours@175°C	ISO 815-1:2008	%	28

OTHER RAIL MATERIALS

Alongside Railsil, we also process MF775 and FR8700 which are other industry standard materials.

RAILSIL TOUGH

We are now introducing **Railsil Tough**. Based on an enhanced Railsil formula, it has nearly double the tear strength and substantially increased abrasion resistance – which makes this new silicone material comparable with industry-grade extrusion EPDMs. At the same time it shares standard Railsil's aesthetic longevity and is formulated to meet the same strict fire specifications and ratings.

Physical properties

Test	Standard	Units	Typical values
Density	ISO 2781:2008	g/cm ³	1.19
Hardness	ISO 7619-1:2008	Shore °A	72
Tensile strength	ISO 37:2005	MPa	9.20
Elongation @break	ISO 37:2005	%	500
Tear strength	ISO 34:2004	kN/m	42.8
Compression set: 22hours@175°C	ISO 815-1:2008	%	20

GANGWAY MATERIALS

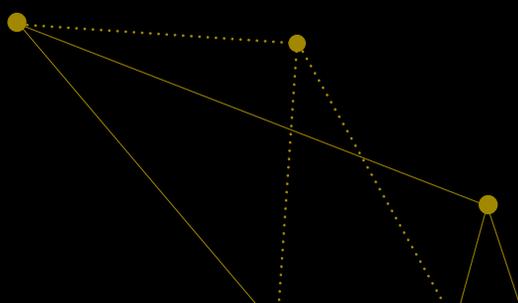
Our silicone material formulated especially for processing by gangway manufacturers has the following approvals:

BS 6853:1999
CEN/TS 45545-2:2009
NF F 16-101
AFNOR
NFPA 130

We can also supply silicone extrusion gangway seals.

OTHER MATERIALS

Along with our rail-specific low smoke and toxicity materials, we have a wide range of other materials which may be of use to you. Please visit www.primasil.com for more details.



MADE-TO-MEASURE MANUFACTURED PRODUCTS

Like our materials, every silicone rubber product we manufacture is matched precisely to your specifications. Our dedicated approach to project management means working hand in hand with you through the whole process to ensure that every need is met.

We have produced more than 5,000 different components at our UK site, where our highly skilled staff share a tremendous pride in continuing the best traditions of British design and manufacture. From tiny diaphragms with a thickness of less than 0.25 mm to moulded parts weighing over 40 kg, our comprehensively equipped press shop allows us to manufacture in whatever volumes suit you – from single prototypes to millions per month.

Every finished product, along with the material from which it is made, is designed with your aesthetic as well as performance requirements in mind. We offer the industry's widest spectrum of silicone colours, and with our state-of-the-art colorimetry equipment we can formulate and mix materials to match any existing colour sample. In fact, the only limit to the colours available is your imagination.

SILICONE RUBBER COMPONENTS FOR THE RAIL INDUSTRY ARE USUALLY MANUFACTURED USING MOULDING OR EXTRUSION TECHNIQUES

Silicone rubber moulding

In compression moulding, a piece of uncured rubber is placed between the two halves of a pre-heated mould and is subjected to high pressure. This relatively simple technique is ideal for small quantities. Injection moulding uses a screw injection system to feed uncured rubber into a closed, pressurised mould. It is typically used for large components, high precision and high volumes. We can also mould silicone sheets, which are ideal if you want to cut your own gaskets and seals.

Silicone extrusion

In this process, silicone is forced through a shaped die to produce tubes, profiles and cords. Compared to other materials, silicone extrusions typically last longer and withstand a wider variety of environmental conditions.



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SILICONE RUBBER MATERIALS AND PRO



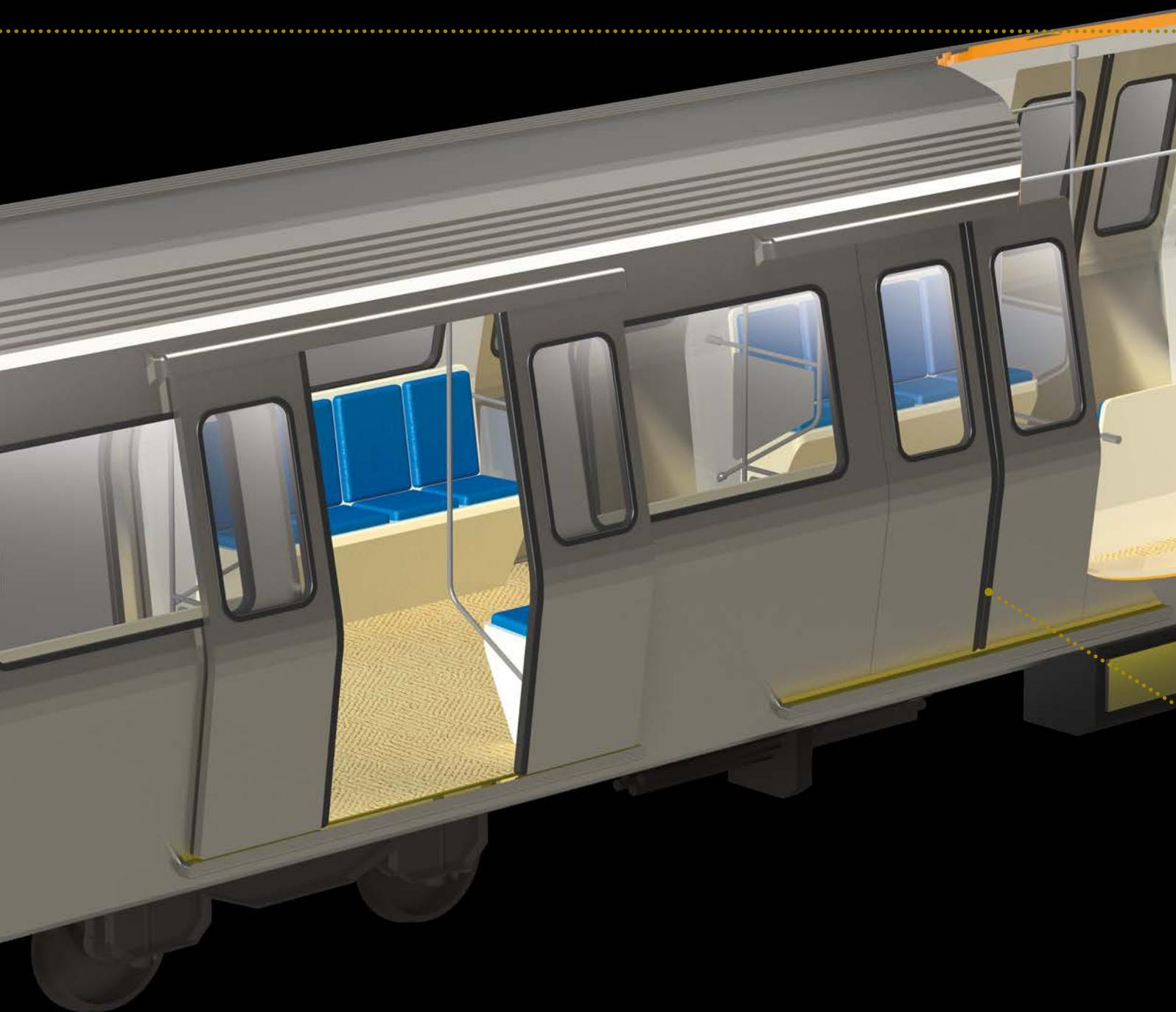
LCD DISPLAY GASKET

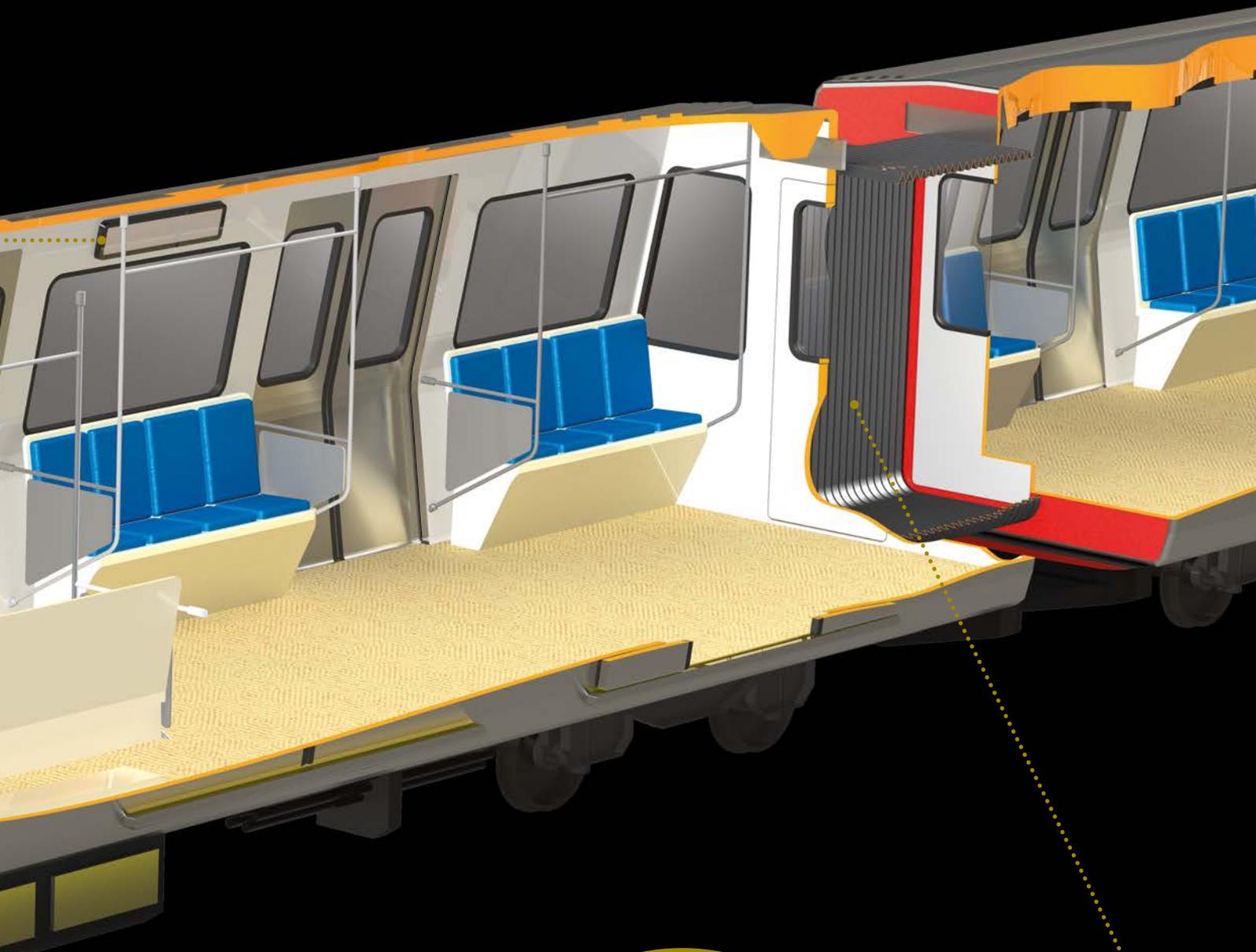


WINDOW SEAL

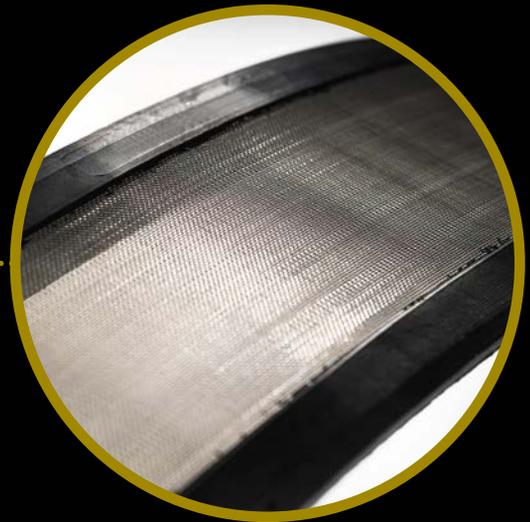
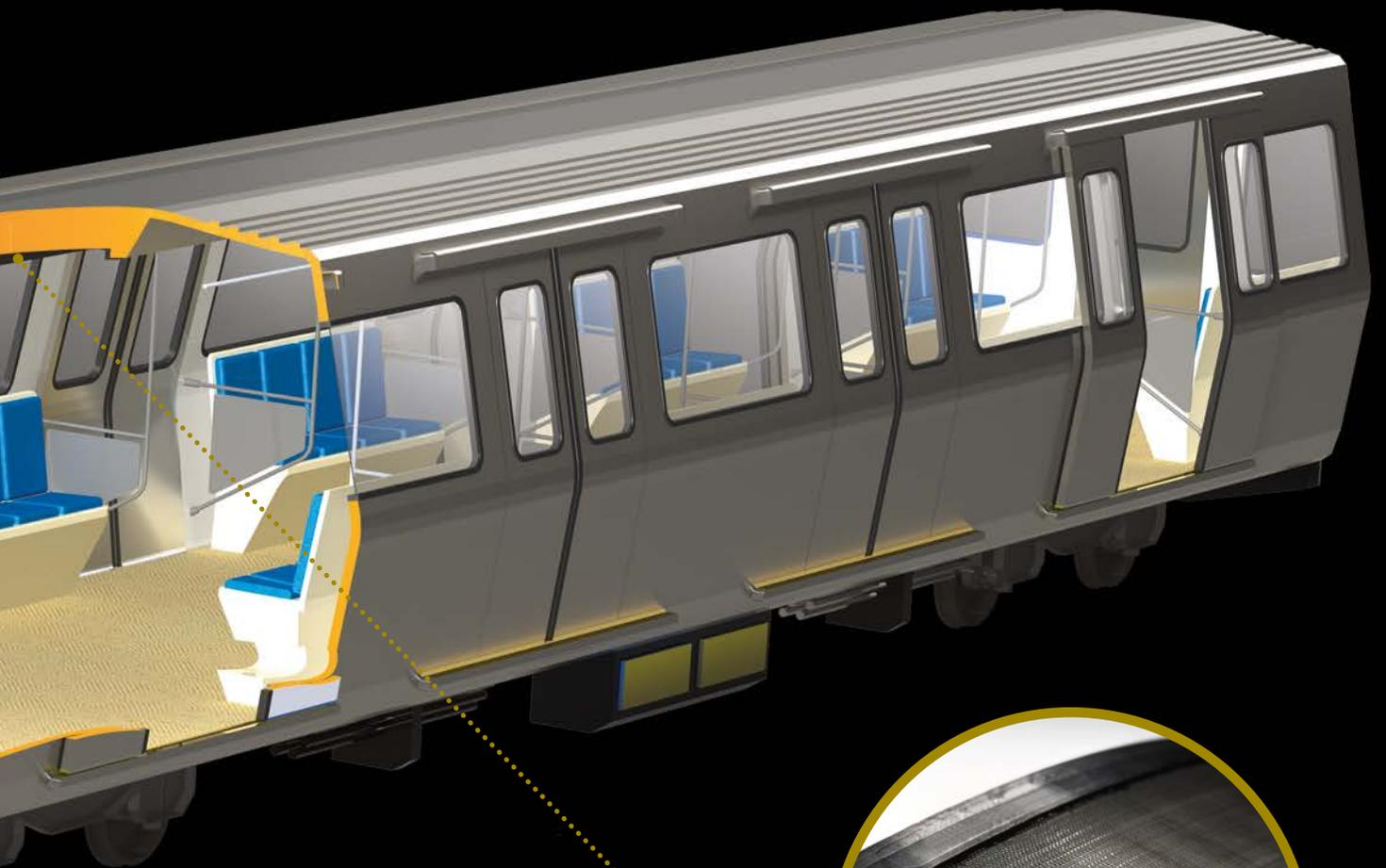


DUCTS FOR RAIL APPLICATIONS





DOOR SEAL



HVAC SEAL



GANGWAY MATERIALS AND SEALS

PROJECT MANAGEMENT

At Primasil we take project management very seriously. Whether you are seeking a very simple product or working on a development programme lasting several years, our comprehensive procedure is essentially the same and always begins with a feasibility study.

At every stage of the process our emphasis is on dialogue, openness and attention to detail, so we understand your needs completely and are able to deliver a result that works well for your application and your business. This approach ensures a smooth and pain-free process.

Our development and production teams will work closely with you to identify the most efficient method of production. Factors considered include time constraints, tooling costs and forecast volumes. By insisting on committing resources in the early stages, we ensure that the solution is cost-effective, scalable and practical.

We use the latest project management software to track progress carefully from the feasibility discussions to delivery of the finished product. Throughout the development, sampling and production stages there is full traceability of all raw materials and components, in accordance with our ISO 9001:2008 accreditation. As well as giving you total confidence in us as your supplier, this will allow reduction in inspection costs at your premises.



QUALITY ASSURED

You can be absolutely certain that the products you receive from us will live up to your expectations. To make sure this happens, we have approved mechanisms in place to cover everything from your initial enquiry through to product delivery.

As a measure of that commitment, we were the first independent silicone company in the UK to achieve ISO 9001:2008 certification. By constantly checking that we are meeting your requirements we can identify and deal with potential problems at the earliest possible stage. This 'right first time' mantra permeates all aspects of our organisation.

To support our quality control work we have a fully equipped laboratory that allows testing on each batch of material. All materials are subjected to a rheometer test, to measure the speed of curing, as well as a specific gravity test and a hardness test. For finished parts we will work with you to determine the most appropriate tests and test equipment, taking into account your product requirements.

CASE STUDIES

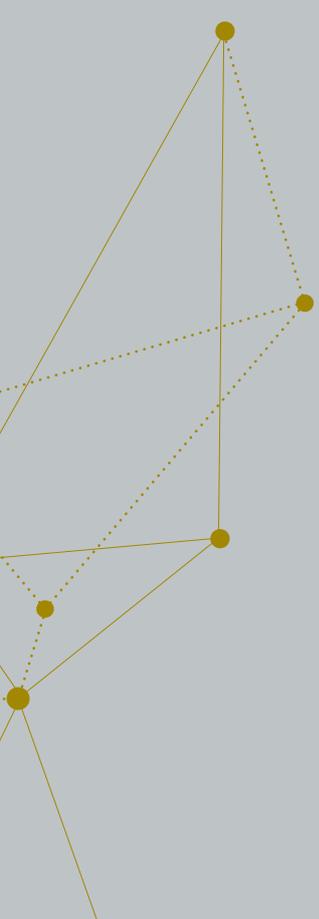
'New generation' gangway

When a major European train gangway manufacturer needed silicone seals for its 'new generation' gangway, we developed a solution around a set space envelope that met all physical and functional requirements, complied with stringent fire test criteria and ensured a precise, aesthetically pleasing colour match. Initial designs were verified using Finite Element Analysis (FEA) software and extruded samples were supplied to the customer. Following the customer's extensive testing process, the seals were approved and are now fitted as standard in these gangways.



Customer-centred approach

One product that epitomises our customer-centred approach and our understanding of the rail sector is Railsil. While working with a leading European train manufacturer we suggested that a black window seal would be a better match with the window design than the colour originally selected. After considerable research and development we came back with the formula for a jet black, fade-free material which met all of the technical and safety requirements. On receiving the final product for review, the customer approved it for use in just two weeks.



Choose Primasil for the perfect tailored fit with your silicone applications.

Why settle for anything less?



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