



3M Solutions for Aerospace



Introduction

Whether you are involved in manufacturing, maintenance or repair in the aerospace industry, we can help. 3M has more than 30 major technology platforms that form the basis for our 50,000 different products.

This guide provides an overview of some of the most commonly used 3M products within the Aerospace industry. With over 50,000 products in our total portfolio, this guide only gives a snapshot of the total product offering. To find out if we have a product to meet your specific application, **please contact our Aerospace Sales office on 0161 237 6174 fax us on 0161 237 3371 or email transportation_solutions.uk@mmm.com**

Many of our products have been vigorously tested to comply with Aerospace regulations including Boeing, Airbus, Rolls Royce, BAE and military specifications. To check if a product meets a specific specification please contact our Aerospace Customer Service Desk in Manchester on the above contact number.



Tapes & Adhesives

3M is a leading supplier of tapes, adhesives, coatings and sealers to the aerospace industry. Our technologies include contact, instant, hot melt and structural adhesives.

Structural Bonding

Since 3M introduced one-part structural adhesives in the 1950s and the first tough two-part formulations in the 1960s, 3M™ Scotch-Weld™ Structural adhesives have been at work in many aerospace applications.

One Part Component Adhesives

3M™ Scotch-Weld™ Epoxy Adhesive EC 2214

Aluminium filled heat curing (121°C/250°F) Structural Adhesive of paste consistency.

- Meets the MMM-S-132 Type 1 Class III Specification
- High Density, High Temperature, High Flex, and Non-metallic Filled versions available
- High strength bonds are obtainable with clean metals and many plastics
- Easy Application by knife coating, trowel, pump and high-pressure injection methods

Two Part Component Adhesives

3M™ Scotch-Weld™ Flexible Epoxy Adhesive Grey EC 2216 B/A

A Flexible, two part, room temperature curing structural adhesive with high shear and peel strength. It is a long work life adhesive with 8-12 hours handling strength. Excellent for bonding plastics, rubber, metal and other dissimilar materials.

3M™ Scotch-Weld™ Toughened Structural Adhesive EC 9323 B/A

A two-part, room temperature curing adhesive. Particularly suited to applications requiring resistance to harsh environments e.g. oils, gasoline, antifreeze, and dry heat.

- Bonds metals, plastics and rigid rubbers
- Extremely high shear strength
- Good temperature resistance
- High Environmental Resistance



3M™ Scotch-Weld™ EPX™ DP 490

A black, two-part toughened epoxy adhesive, designed for use where toughness and high strength are required. It shows special benefits in the construction of composite assemblies. This product has excellent heat and environmental resistance.

Film Adhesives

3M™ Scotch-Weld™ Structural Adhesives AF 163-2:

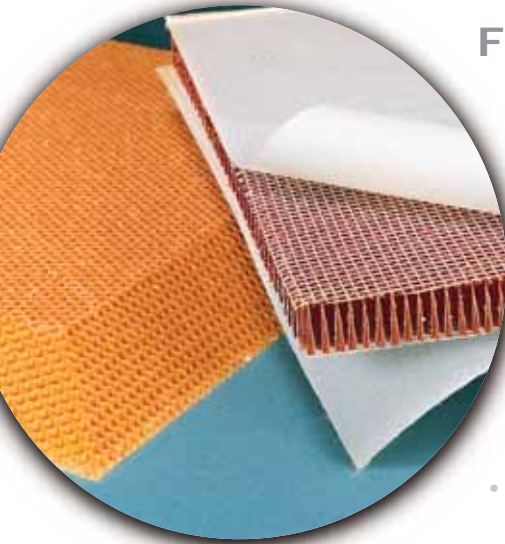
A family of thermosetting modified epoxy structural adhesives in film form, which are available in a variety of weights with or without a supporting carrier. AF 163-2 Films are designed for both solid panel and honeycomb sandwich construction.

- High bond strengths from -55°C to $+121^{\circ}\text{C}$ (-67°F to $+250^{\circ}\text{F}$)
- High fracture toughness and peel strength
- Excellent resistance to high moisture environments before and after curing
- Freedom from volatile by-products during curing which permits low pressure bonding
- Improved shop open time and long shelf life

3M™ Scotch-Weld™ Structural Adhesive AF 3109-2

A thermo-setting, non-volatile modified epoxy film adhesive designed for bonding of honeycomb and metal-to-metal components where high strength at 149°C (300°F) is required.

- Excellent performance in a variety of applications over a range of temperatures -55°C to $+149^{\circ}\text{C}$ (-67°F to $+300^{\circ}\text{F}$)
- Improved resistance to high moisture pre-cure conditions
- Freedom from volatile by-products during cure permits low pressure bonding
- Provided in 2 Weight ranges



Laminating & General Purpose Bonding

3M™ Fastbond™ Water Based Adhesive 30

A water-dispersed, sprayable contact adhesive with high immediate bond strength. Ideally suited for high performance laminating applications, including bonding fabric, foamed plastics and plastic laminate to themselves and to each other.

- Meets MIL-A-24179A Type I
- Long bonding range
- Low VOC Content
- Non-Flammable
- Post formable

3M™ Fastbond™ Adhesive and Spray Activator 2000

A water-dispersed, high solids, activated adhesive, which provides immediate bonding capabilities and handling strength without forced drying equipment. It bonds a variety of substrates and its high performance makes it ideal for laminating applications.





Structural adhesive/tapes product guide

STRUCTURAL BONDING

GENERAL PURPOSE BONDING

HIGH PERFORMANCE BONDING

FILM ADHESIVES

Scotch-Weld™ Structural Adhesive AF 163-2	■		
Scotch-Weld™ Structural Adhesive AF 3109-2	■		
Scotch-Weld™ Structural Adhesive AF 191	■		

ONE COMPONENT ADHESIVES

Scotch-Weld™ Epoxy Adhesive EC 1386	■		
Scotch-Weld™ Epoxy Adhesive EC 1469	■		
Scotch-Clad™ EC 2214	■		

TWO COMPONENT ADHESIVES

Scotch-Weld™ Structural Adhesive EC 1614 B/A	■		
Scotch-Weld™ Semi Rigid Urethane Adhesive EC 3535 B/A	■		
Scotch-Weld™ Semi Rigid Urethane Adhesive EC 3549 B/A	■		
Scotch-Weld™ Semi Rigid Urethane Adhesive EC 3532 B/A	■		
Scotch-Weld™ Adhesive EC 3537 B/A NA	■		
Scotch-Weld™ Adhesive EC 7838 B/A	■		
Scotch-Weld™ Toughened Epoxy Adhesive EC 3333 B/A	■		
Scotch-Weld™ Toughened Structural Adhesive EC 9323 B/A	■		
Scotch-Weld™ Toughened Structural Adhesive EC 9323-2 B/A	■		
Scotch-Weld™ Structural Adhesive EC 7236 B/A	■		
Scotch-Weld™ EPX™ Grey Epoxy Adhesive DP 190	■		
Scotch-Weld™ EPX™ Adhesive DP 460	■		
Scotch-Weld™ EPX™ Adhesive DP 490	■		
Scotch-Weld™ EPX™ Adhesive DP 610	■		
Scotch-Weld™ EPX™ Adhesive DP 760	■		
Scotch-Weld™ EPX™ Adhesive DP 8005	■		

CONTACT ADHESIVES

Scotch-Grip™ Contact Cement 10		■	
Scotch-Grip™ Vinyl Adhesive 1099		■	
3M™ High Strength Aerosol Adhesive Spray 90		■	

WATER-BASED CONTACT ADHESIVES

Fastbond™ 30		■	
Fastbond™ 2000		■	

DOUBLE COATED TAPES

3M™ ATG™ System		■	
3M™ High Performance Adhesive Transfer Tape 9485PC		■	
3M™ Adhesive Transfer Tape 950		■	
3M™ VHB™ 4932P			■
3M™ VHB™ 5962/5952			■
3M™ VHB™ 4645/4611/4655			■

Void Filling

3M™ Scotch-Weld™ Void Filling Compounds provide pioneering technology for filling voids and reinforcing honeycomb cores.

Room Temperature Cure Compounds

3M™ Scotch-Weld™ Void Filling Compound EC 3524 B/A

- A two-part flame retardant, epoxy based void filling compound
- Contains no solvent
- Cures to a strong low-density material within 16 hours at temperatures above 21°C (70°F)
- One component is blue, the other is white so complete mixing can be visually determined

3M™ Scotch-Weld™ Void Filling Compound EC 3534 B/A

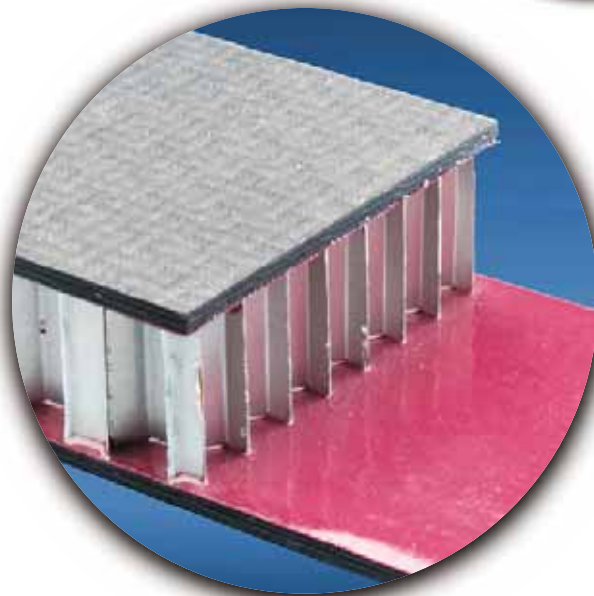
- A two-part room temperature curing epoxy based product
- Low density and high compressive strength
- Designed for fast cure with a 5-10 minutes pot life
- Full cure in approximately 90 minutes at room temperature
- Ideal for repair and fast production lines

Heat Cure Compounds

3M™ Scotch-Weld™ Structural Void Filling Compound EC 3500-2 B/A

A two-part, heat-curing, high temperature resistant, void-filling compound.

- High performance over a range of temperatures from -55°C to +175°C (-67°F to 347°F)
- A convenient 1:1 mix ratio
- Long storage stability
- Long work life
- Low density
- Excellent water and chemical resistance



Void Filling Product Guide

FILM ADHESIVES

3M™ Scotch-Weld™ Structural Core Splice Adhesive Film AF 3002

3M™ Scotch-Weld™ Structural Core Splice Adhesive Film AF 3024

3M™ Scotch-Weld™ Expandable Structural Film Adhesive AF 3030

ONE COMPONENT PASTE

3M™ Scotch-Weld™ High Strength Structural Void Filling Compound EC 3439

TWO COMPONENT PASTE

3M™ Scotch-Weld™ Void Filling Compound EC 3524 B/A

3M™ Scotch-Weld™ Void Filling Compound EC 3534 B/A

3M™ Scotch-Weld™ Structural Void Filling Compound EC 3584 B/A

3M™ Scotch-Weld™ Structural Void Filling Compound EC 3500-2



Protection

Protection Films

Polyurethane protective tapes are a fast and exact way to provide exceptionally tough surface protection on metals and plastics. They are made from a high durable thermoplastic elastomer and pre-coated with either a natural rubber or high performance acrylic adhesive.

3M™ Aircraft Belly Protective Tape Black/Grey 8641

- Designed to protect the lower parts of an aircraft, e.g., belly, landing gear, doors etc. against impact damage
- Provides a unique combination of toughness, durability, puncture resistance, impact resistance and ease of application
- Available in a perforated and non-perforated version

3M™ Polyurethane Protective Tape 8671HS

14.0 mil outdoor grade polyurethane protective tape with high shear acrylic adhesive. Very tough thermoplastic polyurethane elastomer designed to help protect leading edge structures from erosion and abrasion damage.

- Excellent Ultraviolet light resistance
- Abrasion, erosion, scratch, puncture, and impact resistant
- Conformable to most surfaces
- Provides excellent surface protection using a technology that contains no VOC's
- Fast and easy to apply

3M™ Polyurethane Protective Tape 8672

An 8.0 mil general purpose outdoor grade polyurethane protective tape with acrylic adhesive. Tape 8672 is a thinner version of Tape 8671 and shares in common its many advantageous features.



3M™ Polyurethane Protective Tape 8681HS

14.0 mil outdoor grade polyurethane protective tape with high shear acrylic adhesive for aircraft leading edge surface protection.

- Excellent resistance to Ultraviolet light
- Conformable to most surfaces
- Provides excellent surface protection using a technology that contains no VOC's
- Fast and easy to apply
- Matt surface finish
- High Shear formulation provides better peel strength and shock resistance



3M™ Polyurethane Protective Tape 8663DL

8663DL provides a unique combination of toughness, durability, puncture resistance, and ease of application in helping prevent fluid penetration, which could result in aircraft corrosion.

- Ideal for Galley floor applications; provides a barrier against liquids from penetrating flooring. Protects aircraft entry areas and galleys from soiling
- Double liner construction for ease of application
- Coated with a long ageing solvent resistant, pressure sensitive acrylic adhesive



Other Polyurethane Protective Tapes available

	EXTERIOR LEADING EDGE	UNDERBELLY PROTECTION	GALLEY FLOOR PROTECTION	INTERIORS
3M™ Polyurethane Protective Tapes:				
3M™ Polyurethane Protective Tape 8544	■			
3M™ Polyurethane Protective Tape 8663	■			
3M™ Polyurethane Protective Tape 8672	■			
3M™ Polyurethane Protective Tape 8671/8671 HS	■			
3M™ Polyurethane Protective Tape 8681HS	■			
3M™ Aircraft Belly Protective Tape Black/Grey 8641		■		
3M™ Polyurethane Protective Tape 8694DL			■	
3M™ Polyurethane Protective Tape 8693DL			■	
3M™ Polyurethane Protective Tape 8663DL			■	
3M™ Polyurethane Protective Tape 8561				■
3M™ Polyurethane Protective Tape 8560				■
3M™ Indoor Grade Polyurethane Protective Tape 8562				■

Maintenance and Repair

3M offer a wide assortment of permanent and temporary tapes because every sealing, holding and masking challenge is different.



Flame Retardant Sealing Tape 367FR/(398FR)

A Glass Cloth Tape designed to seal seams on aircraft ducting and cargo area panels. Typical applications also include warm and cold air duct sealing in high and low velocity systems.

- Flame retardant
- High tensile strength
- Strong synthetic adhesive with long term holding power
- Easy application
- High Conformability

3M™ Scotch® Aluminium Foil Tape 425 (Speed Tape)

- Scotch® Tape 425 is well known as a high speed repair tape
- Suitable for indoor and outdoor use
- Provides excellent protection from water, dust, chemical damage and radiation
- Typical applications include, masking for paint stripping, sealing and protecting polycarbonate windows, covering antennas, lap joints, and wheel parts
- Available in lined version – Tape 427

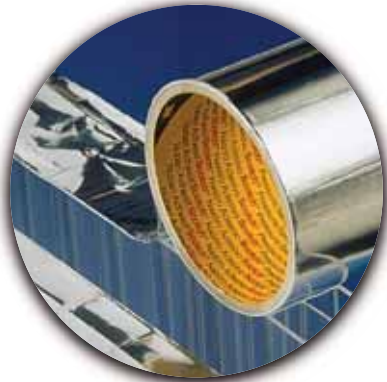
Scotch® Impact Stripping Tape 500

Designed for a variety of impact stripping operations.

- Special compound rubber backing is conformable, easy to cut and easy to work with.
- Silicone paper liner releases easily, requiring less effort to remove after die cutting.

Carpet Protection Tape

3M™ Surface Protection Film 5038A is recommended for the protection of sensitive surfaces against dirt, dust and damage. 3M Surface Protection film 5038A has a high level of adhesive making it ideal for protecting carpets and rough structured surfaces and is easily removable. Resistant against moisture, oil and solvents.



Scotch® Performance Masking Tape 2364

New 3M™ technology gives this strong, smooth crepe paper masking tape good holding power in a broad range of temperatures up to 300°F. Clean removal from many surfaces make this an excellent tape for many industrial applications.

- Meets specification BS4J11
- Good holding power in a broad range of temperature applications
- Easy tearing and sliver resistance
- Adhesion to Steel: 36 Oz/in. width. Tensile: 30 lbs./ in
- Clean removal at up to 300°F(148°C) for 30 minutes

Maintenance and Repair

Scotch® High Temperature Masking Tape 213

Scotch® Fine line masking Tape 215

Scotch® Fine line masking Tape 218

Scotch® General Purpose Masking Tape 2321

Flame Retardant Sealing Tape 367FR / (398FR)

Scotch® Aluminium Foil Tape 425 / 427

Scotch® Performance Masking Tape 2364

Scotch® Impact Stripping Tape 500

Scotch® Plastic Film Tape 471

Scotch® Plastic Film Tape 472

Scotch® High Temperature Nylon Tape 855

Scotch® Composite Bonding Tape 8901

Scotch® Composite Bonding Tape 8902

3M™ Surface Protection Film



Abrasives

3M provides a wide range of coated abrasive and surface conditioning products to meet the needs of both production applications and day to day MRO situations. Choose from hand pads, rolls, discs, wheels, belts and various bench area products. And of course, we offer a complete line of accessories to optimize product performance.

Abrasive Applications

	GRINDING	BLENDING	CLEANING	FINISHING	DEBURRING	SEALANT REMOVAL
3M™ 501 Fibre Discs	■					
3M™ 785C Fibre Discs	■					
3M™ Green Corps™ Flexible Grinding Discs	■					
3M™ 777F Roloc™ Disc	■					
3M™ 777F File Belt	■					
Scotch-Brite™ Surface Conditioning Discs		■		■		
3M™ Roloc™ Surface Conditioning Discs		■		■		
Scotch-Brite™ Surface Conditioning File Belts		■		■		
3M™ 245 Hookit™ Discs		■				
3M™ 245 Stickit™ Discs		■				
3M™ 255P Hookit™ Discs				■		
3M™ 255P Stickit™ Discs				■		
Scotch-Brite™ Handpads – Various Grades		■	■	■		
3M™ Bristle Discs			■			
3M™ Radial Bristle Brush			■			
3M™ SR Cutters						■
3M™ SR Radial Bristle Disc			■			■
Scotch-Brite™ Aircraft Cleaning Pad 33			■			
Scotch-Brite™ High Performance Cleaning Cloths			■	■		
3M™ Clean & Strip GP Blue Discs			■	■		
3M™ Clean & Strip XT Purple Discs			■	■		
3M™ Coating Removal Disc			■			
Scotch-Brite™ Finishing Wheels				■	■	
Scotch-Brite™ Deburring Wheels					■	



3M™ Roloc™ Abrasive System

The Roloc Abrasive System is designed to offer you fast and convenient grinding and finishing using small abrasive tools. All the products in the range feature the unique Roloc twist on, twist off fixing system so you can easily change grade, size, abrasive technology and product in seconds, producing outstanding results in a fraction of the time.

Sealant Removal

3M™ SR Cutters

Designed to remove thick layers of sealants without damaging the underlying coatings and surfacing. Examples of sealants are polysulfide, polythioether, RTV sealants, and silicones. The 3M SR Cutters are a plastic rotary cutting tool for use on slow speed right angle drills.

- Minimal or no abrasion to paints, primers or metal on aircraft
- Mechanises procedure (vs. hand-scraping), which saves time, effort, and money while providing smoother results in about half the time
- No chemicals to apply and clean up or chemical waste
- Recommended by Boeing

3M™ SR Radial Bristle Discs

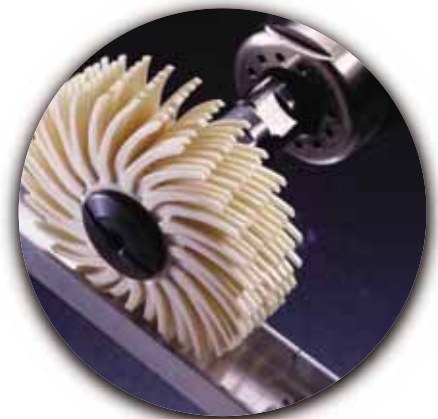
These plastic abrasive particle-filled products remove 1.6mm or less of sealants, silicones, etc. from various surfaces. The unique construction removes the sealant without damaging the underlying surface.

- Sealant removal without the need to repaint/reprime damaged coatings
- Removes sealants and residues quickly; no waiting for chemicals to act or handling of liquid hazardous waste
- No reshaping of blunt plastic scrapers
- Unique bristle pattern provides conformability and accesses hard to reach places that are difficult to scrap
- Non-loading

Cleaning

Scotch-Brite™ Aircraft Cleaning Pad 33

A textured non-woven web coated with a unique non-abrasive polymer. The Scotch-Brite Aircraft cleaning pad 33 sheets are designed to clean dirt and residue from high and low gloss coatings, such as those used on the exterior of aircrafts. The non-abrasive polymer increases the wet-friction, and therefore the ability to efficiently clean surfaces but at the same time it will not scratch the surface or coatings.



Workforce Safety

3M can help protect your workforce with a complete range of individually designed personal safety products. Our respirators are designed for lightness and comfort while offering the highest level of protection against most hazards including dusts, chemicals and welding fumes. 3M can also help protect workers' hearing in noisy workshop environments with a range of ear plugs and hearing defenders.

3M™ 9300 Series Respirators

The 3M 9300 series are a range of maintenance free respirators. Our newest range of respirators have improved comfort and fit and conform to the latest EN149:2001 Standard. Valved versions are available to reduce heat and moisture build-up.

3M™ 4000 Series Respirators

The 3M 4000 series is a range of integral construction respirators designed for effective and comfortable protection against hazards found throughout industry. The unique design and in-built non-replaceable filters makes this the perfect choice to avoid time consuming maintenance and record keeping.

Powered and Air-supplied Respirators

3M offers you the widest range of battery powered turbo units and supplied-air respirators to provide fresh air to the headtop. This range provides a selection of headtops to suit a wide range of industrial applications, with unequalled pedigree, gained in the toughest conditions. This range offers all the comfort of refreshing, moving air.

Hearing head and face protection

3M have developed an integrated range of products to keep your head, face and hearing safe. All 3M Hearing Protection products are designed to be both practical and comfortable. Our products range from simple foam earplugs and helmets to the latest high-tech electronic earmuffs.





Workforce
Safety

Respirators

To help you select the right 3M™ Respirator, please use the table below which has been designed to highlight a selection of hazards you may encounter and the suggested 3M Respirator*.

Application	Hazard	9913/9914	8822/9322/8625	9925/9928	8835/9332	4251/4255	6000 Series**	7000 Series**	Alstream™ Respirator AH1, 4, 4A	Alstream™ Respirator AH9, 11	Dustmaster™ Turbo + QRS # headtop	Jupiter + QRS# headtop	Visionair™ Airfired Respirator 500/510	3M™ Flowstream™ airfired regulator + 3M™ QRS headtop	S-200 Airfired Respirator fitted with 3M 6000/7000 facepiece	SCBA ^Δ
Stainless Steel Welding	Fine particles & metal fume			■	■		■			■		■				
Spot Welding	Fine particles & metal fume			■	■		■	■		■		■				
Lead Loading	Fine particles & metal fume		■	■	■		■	■			■	■				
Lead Sanding	Fine particles		■		■		■	■			■	■				
Finishing 'cured' epoxy resins	Fine particles		■		■		■	■			■	■				
General paint spraying	Paint mist and solvent vapour					■	■	■					■	■	■	■
Adhesive spraying	Adhesive mist & solvent vapour					■	■	■					■	■	■	■
Paint stripping – (chemical based)	Solvent vapour (not dichloromethane)						■	■	■					■	■	■
Paint spraying – ('two pack')	Isocyanates													■	■	■
Brush applied paints	Solvent vapour	■				■	■	■				■				
Brush applied adhesives	Solvent vapour	■				■	■	■				■				
Polyester resin spraying	Mist and solvent vapour					■	■	■					■	■	■	■
Polyester resin hand mixing	Fine particles & solvent vapour	■				■	■	■					■	■	■	■
Polyester resin sanding	Fine particles	■	■		■		■	■				■				
Rubbing down paintwork	Fine particles	■	■		■		■	■				■				
Coolant mist emissions	Fine mists particulate				■		■	■				■				
Fuelling vehicles	Organic vapour					■	■	■					■	■	■	■
Entering confined spaces	Oxygen deficiency/high hazard level															■

* This guide is only an outline. It is designed to help focus on the most appropriate respirators in the 3M range for particular applications. It should not be used as the only means of selecting a respirator. Details regarding performance and limitations are set out on the respirator packaging and fact sheets.

** A range of filters is available for these respirators. Please contact 3M for advice on appropriate selection.

Δ SCBA = Self Contained Breathing Apparatus

QRS = Quick Release Swivel (new unique headtop to breathing hose connection).



Related Technologies

3M™ Safety-Walk™

Safety-Walk offers a full range of floor level safety products to minimise risk of slip, trip and fall accidents in many applications. Available in a variety of sizes and colours and can be die-cut to specific measurements on request.

Description	Application	Colours	
3M Safety-Walk Conformable surfacing	Abrasive particles bonded by a tough, durable polymer to a soft aluminium foil	Especially for irregular or contoured surfaces. Foil backing permits rolling or hammering into shape, making it ideal for chequer plate. Good resistance to petrol and solvents	Black Yellow
3M Safety-Walk General Purpose Surfacing	Abrasive particles bonded by a tough, durable polymer to a dimensionally stable plastic film	Most frequently used for all slippery surfaces with intensive pedestrian or light vehicle traffic (ramps, stairways, ladders)	Black, Clear Yellow, Brown Green

3M™ Novec™ Engineered Fluid

3M Novec Engineered Fluids are ideal for a wide range of Aircraft cleaning applications. They exhibit a unique balance of environmental, safety and performance properties. Applications include removing dirt from the exterior surface to prevent corrosion; cleaning of landing gear assemblies on the aircraft and vapour degreasing of disassembled parts; engine cleaning and, spray and vapour degreasing of hydraulic lines and spilled hydraulic fluid.

3M™ Electrical Products

3M designs and manufactures a comprehensive line of electrical products that can address your diverse applications. Widely recognised for innovation, reliability, global corporate strength, you can trust 3M to have the products you need.

With more than 50,000 successful products, across 30 different technology platforms, there are many ways in which 3M can provide solutions for the aerospace industry.

**To learn more call our aerospace customer service line on 0161 237 6174
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