ALLPLASTICS
ARCHITECTURAL & BUILDING

METALINE® *splashbacks*

FABRICATION *manual*

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SECTION 1: *key information*

SECTION 1: *key information*

Key points about METALINE® *splashback systems*

Important Information

- Allplastics Metaline Splashback system **must** be installed as per Section 5 - "Kitchen Splashbacks Installations" contained in this manual to deliver optimum product performance and compliance. All installations require a registration card to be completed by the installer to verify compliance with the installation instructions. Only registered installations will carry Laminex's warranty.

- The minimum set back distance between the installed Allplastics Metaline Splashback panel and any cook top (gas or electric) is 30mm. This is to prevent impact damage caused by oversized pots being used on the rear burner or element. Installations that are closer than 30mm will not be warranted. Allplastics Metaline Splashbacks are not suitable for installations where benchtop is less than 600mm.

- The Allplastics Metaline Splashback system has a proprietary coating that allows it to be cleaned easily. Cleaning of Metaline Splashbacks should follow the "Care and Maintenance" section, which is contained later in this manual and also on the consumer warranty card. Deep gouges caused by abrasive cleaners or scouring pads will not be warranted.

- Allplastics Metaline Splashbacks are certified by SAI Global under the CodeMark scheme for use as Splashbacks under the BCA and BCNZ, when installed according to these guidelines. CodeMark certification number is SAIG-09-CM20030.

- Allplastics Metaline Splashbacks have been assessed for fire safety properties. Allplastics Metaline Splashbacks are classified as Group 2 (under specification A2.4 of the BCA) and have the typical fire indices of 0 (Ignitability index), 0 (Spread of flame index), 0 (Heat evolved index) and 0-6 (Smoke developed index).

- ALWAYS follow the installation instructions as described in Section 5 of this document. Failure to follow the installation instructions may create a potential fire hazard to the consumer and will void any warranty. Any installation that is outside these guidelines would not be certified under the CodeMark scheme.

General Information

7. **Safety** – always wear appropriate PPE when handling or cutting Allplastics Metaline Splashback panels.

- **Lifting** – Allplastics Metaline Splashback panels are heavy and require a 2 man lift or mechanical assistance. Always lift panels in a vertical orientation to avoid buckling the panel.

- **Transport** – always transport Allplastics Metaline Splashback panels horizontally on a solid pallet that supports the entire length of panel. Ensure that panels are carefully strapped and protected with top and bottom coversheets to prevent damage. Multiple sheets should be transported with the decorative faces together (protective film).

- **Inspection** – any sheets that show visible damage (dents, impact damage, deep scratches through the protective film, etc.) should be rejected unless the damaged section is outside of the required usable area. Installation of damaged sheets is not warranted.

- **Cutting** – always use a dedicated aluminium-cutting blade for all straight cuts. The use of vacuum extraction is recommended to prevent build-up of swarf on the work piece or cutting equipment.

- **Folding** – Allplastics Metaline Splashbacks can be folded around or into corners to give a continuous corner without any joins. The Allplastics Group recommends folding edges and corners to give the installation a premium look and feel.

- **Butt joining** – Allplastics Metaline Splashbacks can be butt joined together or into corners to give a simpler installation. Allowance for a 3mm gap for silicone sealing is required.

- **Penetrations** – Allplastics Metaline Splashbacks can be cut for plumbing and electrical installations. Cutting can be performed using hole saws or a jigsaw. Allowance for a 3mm expansion gap around joins is required. Allplastics Metaline Splashbacks are electrically conductive, so all electrical work must be performed by a licenced electrician. All plumbing work must be performed by a licenced plumber or gas fitter.

- Allplastics Metaline Splashbacks are produced with a thick protective film on the decorated side of the panel. This protective film includes installation instructions, cleaning instructions and orientation guide arrows for reference during installation. DO NOT REMOVE the protective film either before or during fabrication. Protective film should only be removed as direction in Section 5 - Kitchen Splashback Installation instructions.


ASKO

SECTION 2: *product introduction*

SECTION 2: *product introduction*

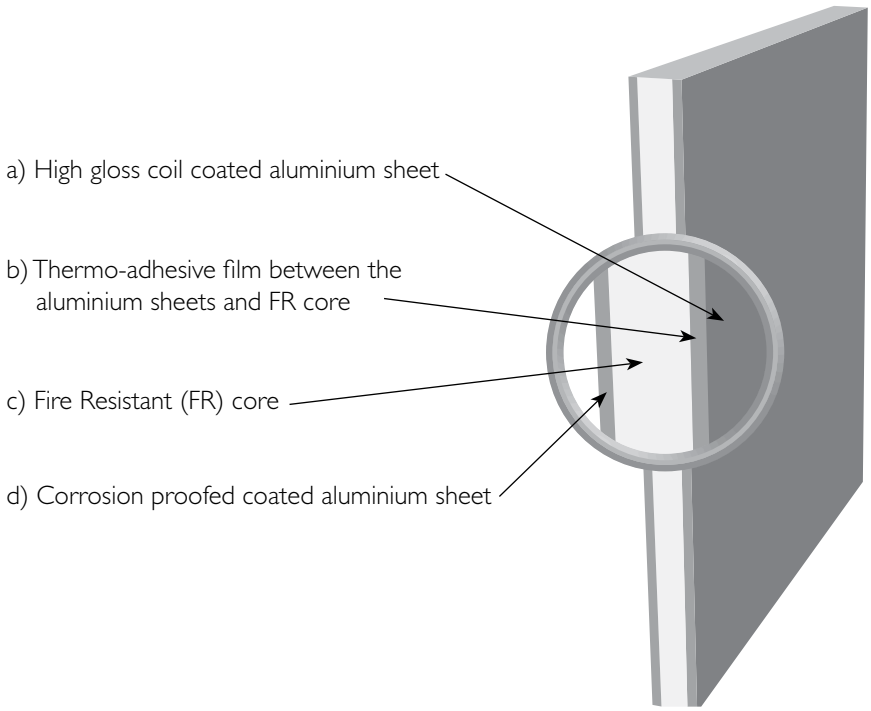
Introduction to **Allplastics**® METALINE® *splashback systems*

Product Characteristics

Allplastics Metaline Splashbacks are an aluminium composite panel consisting of two coil-coated aluminium sheets bonded onto both sides of a Flame Retardant (FR) core. Bonding of the aluminium and FR core is achieved by both chemical and mechanical action, which gives excellent bond integrity. An exceptionally flat, corrosion-resistant panel, Allplastics Metaline Splashbacks are simple to install and produces a premium finish.

The coated aluminium sheets are 0.5mm thick, sandwiched onto a 3mm FR core to give a total thickness of 4mm and density of 7.5 kg/m^2. The high gloss decorated surface is a proprietary formulation that is easy to clean, mark and stain resistant and fire resistant. It has a minimum gloss measurement of 80 gloss units.

The corrosion-proofed surface is a matt grey colour. Printed onto the back surface are the product name, product colour, ASW code and manufacturing batch code.



Product Applications

Allplastics Metaline Splashback panels are suited for use in all splashback applications, when installed according to "Section 5 – Kitchen Splashback Installation", for both gas and electric cooktops. Allplastics Metaline Splashbacks are CodeMark certified to meet the requirements of the BCA and BCNZ.

Other applications suited to Metaline include:

- Wall panels for wet areas (laundry, bathroom, toilets)
- Wall panels for dry areas (commercial and domestic applications)
- Wall linings for commercial applications (lifts, displays, caravans, etc.)
- Decorative vertical panels

Sheet Sizes

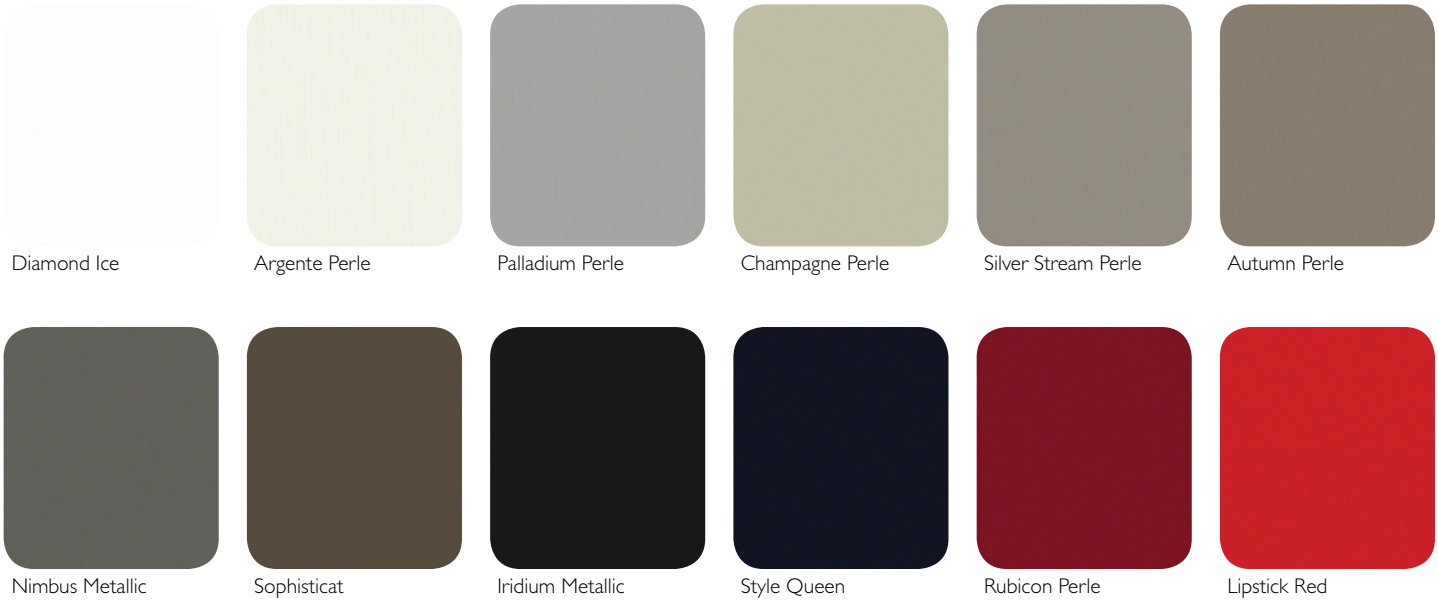
Allplastics Metaline Splashbacks come in 2 main sheet size:

- 3600 x 800 mm
- 3600 x 1500 mm

All sheets have a protective film on the decorated surface to prevent physical damage during storage, handling and fabrication. Do not remove this protective film until instructed to during installation.

Colours

Allplastics Metaline Splashbacks are available in a range of 12 colours:



Metallic Colours

Argente Perle, Rubicon Perle, Champagne Perle, Nimbus Metallic, Autumn Perle, Iridium Metallic, Palladium Perle and Silver Stream Perle are metallic colours, with a fine metallic flake impregnated into the coating surface. Thus gives the panel a unique "active colour" look, depending on the angle from which it is viewed. These colours are also directional, so the sheets must be installed in a consistent direction.

Solid Colours

Diamond Ice, Style Queen, Sophisticat and Lipstick Red are solid colour panels, which offer a consistent high gloss reflective colour appearance.

Other colours are under development and will be released to meet the growing demands of consumers, specifiers and designers.

Adhesives

Allplastics Metaline Splashback neutral cure silicone adhesive has been developed for installation. Silicone will be available in 300g cartridge suitable for use in standard hand caulking guns. Additional cartridges are available to order from your local Allplastics Group sales branch.

Allplastics Metaline double-sided tape has been developed for installation. Double-sided tape will be available in rolls from your local sales branch of The Allplastics Group.

Warranty

Allplastics Metaline Splashbacks have a 7-year limited warranty, when installed by an authorised fabricator according to this Installation Guide.

Care and Maintenance

Allplastics Metaline Splashbacks are easy to clean using mild detergent and a soft, abrasion free microfibre cloth. Cooking oil, fats and food splashes are easy to remove.

- DO use a soft micro-fibre cloth with a mild detergent
- DO clean the surface regularly
- DO NOT allow food stuffs to build up on the surface
- DO NOT use abrasive cleaners or pot scrubbing pads
- DO NOT use cleaning solutions that are highly acidic or caustic
- DO NOT clean the surface if it is hot
- DO NOT place metallic or sharp implements against the surface, which may cause scratching

Product Technical Specification

PROPERTY	RESULT
Fire Indices (AS/NZS 1530.3)	0,0,0,0-6
Fire Classification (AS ISO 9705)	Group 2
Dry Heat resistance (AS/NZS 2924.2)	180°C for 20 minutes – no effect
Steam Resistance (AS/NZS 2924.2)	30 minutes – no effect
Chemical Resistance (AS/NZS 2924.2 - Groups 1-4)	No effect
Thermal Conductivity @ 200°C – Metaline only	0.574 W/m-K
Thermal Conductivity @ 200°C – Metaline + mineral board*	0.096 W/m-K
Thermal Resistance @ 200°C – Metaline only	0.007m^2K/W
Thermal Resistance @ 200°C – Metaline + mineral board*	0.102m^2K/W
Scratch Resistance	0.8N
Gloss (AS/NZS 1580.602)	>80
Coefficient of thermal expansion	2.36 x 10^{-5} m/°C (0.0236 mm/m/°C).

Product Tolerances

PROPERTY	RESULT / TOLERANCE
Thickness tolerance	+/- 0.1 mm
Width tolerance	-0/ + 3 mm
Length tolerance	-0/ + 4mm
Difference between diagonals	Max 3 mm

*For more information on mineral board refer to section 5 – Kitchen Splashback Installation

SECTION 3: *planning your installation*

SECTION 3: *planning your installation*

Important Design Considerations – Types of Fabrication

Allplastics Metaline Splashbacks can be fabricated in two main styles:

PREFERRED METHOD:

Folded internal corners, rolled edges

- This method gives a premium finish with no exposed cut edges and more professional corner detail.
- Utilises Metaline's unique forming characteristics to produce an internal or external folded corner.
- No joins and seamless finish



ALTERNATIVE METHOD:

Butt joined corners, straight cut edges

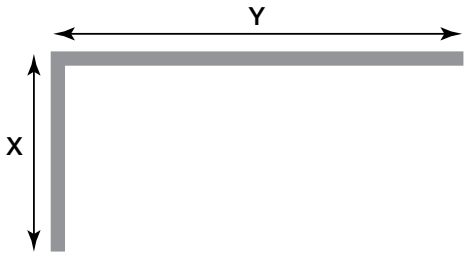
- This method is the same as glass splashback installation and offers a less sophisticated installation, without sacrificing the benefits of Metaline splashback panels
- Joins will be visible and edges will be exposed



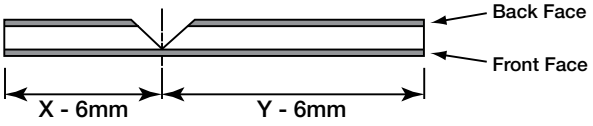
PREFERRED METHOD:
Fabrication Type – Folded Internal Corners

For fabrications where the Metaline is folded into the corner of the kitchen with a 90° seamless fold (as opposed to the traditional glass method of 2 sheets being butted together), the following sequence is observed:

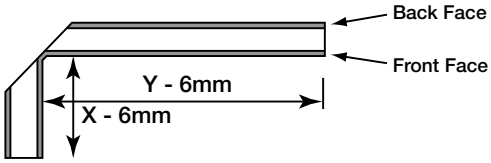
1. Measure the internal dimensions of the corner:



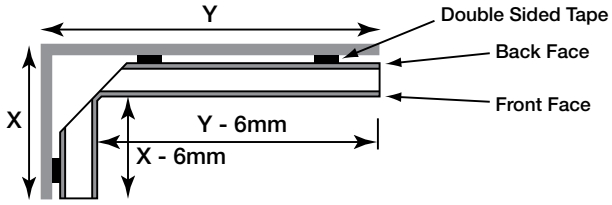
2. Allowance is made for the panel fold in the measurement as per below:



3. Panels are routed using a 90° V bit behind the section to be fold to allow for the panel to be bent, giving the following finished fold:



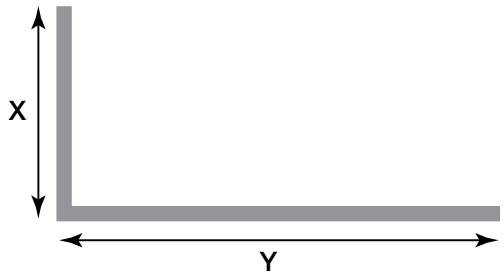
4. The installed section will look like:



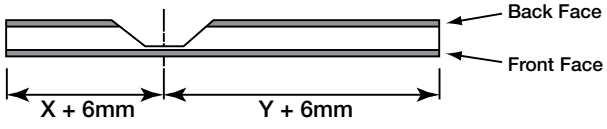
PREFERRED METHOD:
Fabrication Type – Folded External Corners

For fabrications where the Metaline is folded outwards to give a 270° seamless fold around the outside corner of a kitchen, the following sequence is observed:

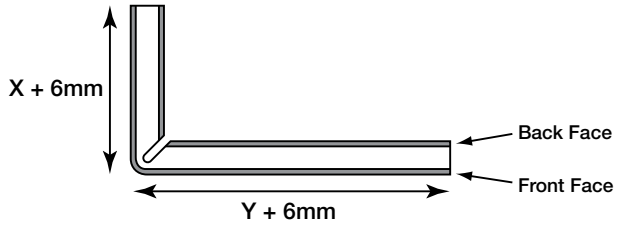
1. Measure the external dimensions of the corner:

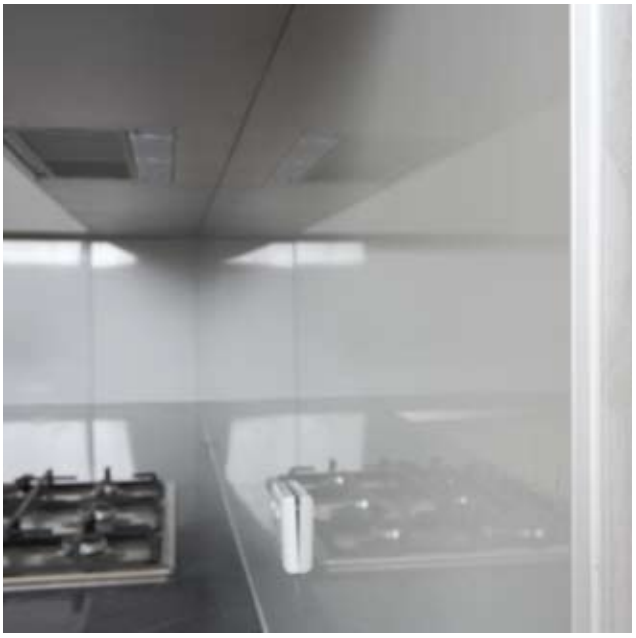


2. Allowance is made for the panel fold in the measurement as per below:

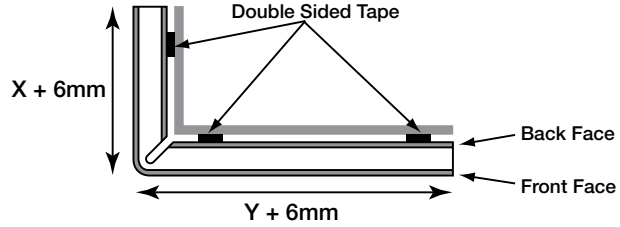


3. Panels are routed using a 135° V bit behind the section to be fold to allow for the panel to be bent, giving the following finished fold:





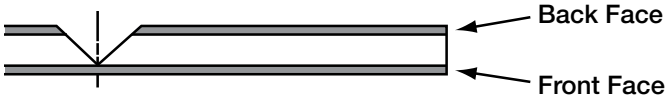
4. The installed section will look like:

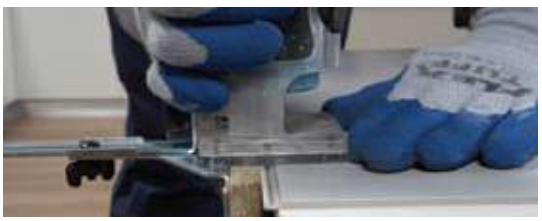


PREFERRED METHOD:
Fabrication Type – Folded Rolled Edges

Folded rolled edges give a completely encapsulated finish to the sheet, which hides the core of the panel from view.

1. Allowance is made for the edge fold in the measurement as per below:





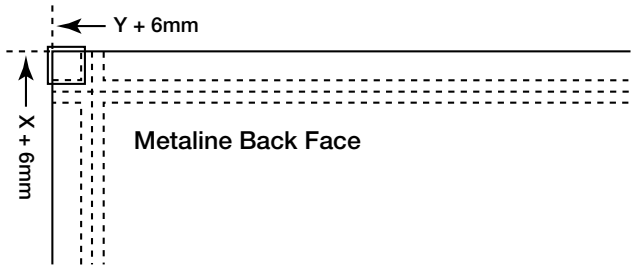
2. Panels are rebated behind the edge fold section to allow for the panel to be rolled over, giving the following finished edge detail:

3. The slight overlap of the fold is retained to allow for the thickness of the double sided tape and silicone fastening to the wall.

4. This method is ideally suited to installations where more than one sheet is required to span the wall. It gives a premium join appearance by concealing the cut edge of the sheet.

Fabrication Type – Finished Corner Details

Where the sheet requires two rolled edges to meet on corners, the following method is used to allow for the edge folds to encapsulate the core:



1. Router the back of the sheet as per previous detail for rolled edges allowing the two passes to criss-cross over the corner edge.

2. Remove the section of material as shown in red using a sharp chisel.

3. Roll the two sections over and the corner should meet without any overlap.

ALTERNATIVE METHOD:

Fabrication Type – Butt Joined Sheets

Butt joining sheets as flat panels without any folding is a simpler method of fabrication. This method does not allow for external folded corners around walls or seamless joins in corners. Ensure that all gaps are maintained at 3mm (with packers) to allow for silicone sealing. The method of installation is explained in Section 5.

Important Design Considerations – Expansion and Orientation

Thermal Expansion

Allplastics Metaline Splashbacks is an aluminium based composite material and will therefore exhibit minor expansion and contraction behaviours during heating and cooling. Thermal expansion must be considered when calculating dimensions and allowances for joins between sheets and around edges.

Allplastics Metaline Splashbacks has a coefficient of expansion of 2.36×10^{-5}m/°C (0.0236mm/m/°C). Allow a gap of 3mm between sheets when butt joining them, and allow an edge gap of 3mm around all panels for caulking and sealing.

Direction of Coil Coating

Metallic coatings have a reflective or pearlescent finish, which is oriented in the longitudinal direction during the coil coating process. This gives the panel "active colour" behaviour, dependent on the angle from which it is viewed. Directional arrows are printed onto protective film and should be used to maintain orientation correctness and avoid shading differences between adjacent panels. This orientation must be taken into account when making panel optimisation calculations.

Always use Allplastics Metaline Splashbacks panels from the same batch code for a job, rather than mix panels. This will avoid any minor colour variations caused by the coil coating process.

Health and Safety

Fire Safety

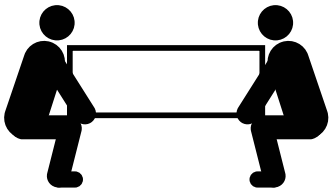
Allplastics Metaline Splashbacks requires the installation of Allplastics Metaline Calcium Silicate board directly behind the cooktop to ensure adequate fire safety is achieved. (See section 5 – Kitchen Splashback Installation for further information). Not applicable when Allplastics Metaline Splashbacks are installed directly onto rendered brickwork, cement or brick walls.

Occupational Health and Safety

Metaline Splashback panels are heavy, with a 3600mm x 800mm sheet weighing approximately 22kgs and a 3600mm x 1500mm sheet weighing approximately 41kgs. Both sheet sizes require assisted handling.

Manual handling

- Two person lift
- Lift on edge to avoid flexure bending



Mechanical devices

- Vacuum lifting
- Transport on suitable flat trolley

Personal protective equipment

Cutting Metaline Splashback systems will generate noise, flying hot swarf and sharp edges. Ensure that appropriate PPE is worn at all times during this operation. Eye protection, hearing protection and gloves should be worn at all times during cutting operations.

MSDS

A MSDS for Metaline is available from The Allplastics Group – Allplastics.com.au

Laminex®

METALINE® *splashbacks*

SECTION 4: *cutting of panels*

SECTION 4: *cutting of panels*

Tools and Equipment

Cutting Equipment

Allplastics Metaline Splashbacks panels can be cut with traditional tools fitted with a suitable aluminium cutting blade – either tungsten carbide or high speed steel.

The following cutting equipment can be used for cutting Metaline panels:

- Panel or table saw (using aluminium cutting blade – e.g. Leitz 68800)
- Circular saw (using aluminium cutting blade)
- Hand router (high speed TC blade)
- Milling machine or CNC (high speed TC blade)
- Jigsaw (using aluminium blade only)
- Handsaw (metal cutting blade)
- Holesaw or Drill (using HSS drill bits)

Recommendation - always use vacuum swarf extraction to prevent build up on panel or cutting equipment.

Additional Tools Required

- Glazier's suction cup x 2
- Straight edge
- Builders angle
- Measuring tape
- Plasterboard saw
- Fixing screws – 25mm length, self tapping
- Utility knife
- Metal file
- Edge tape roller (metal roller) for rolled over edge finish
- 3mm packers

Transport, handling and storage

Store the panels flat in an environment of approximately 20-25°C for at least 24 hours before commencing any installation or cutting operations to allow them to reach a constant temperature. This will ensure that dimensions remain constant during any cutting and installation process. Always allow Metaline panels to reach constant temperature after transport (particularly in very hot or cold weather). Temporary storage of Allplastics Metaline Splashbacks on-site should be flat with a sheet of cardboard, polystyrene or foam between the panels. Do not remove the protective film until directed.

Handling of Allplastics Metaline Splashbacks requires care. It is recommended that panels be supported at several points along their length (the number of support points depending on the length of the panel). Panels should be manually lifted vertically, mechanically lifted horizontally.

Sheet Inspection

Always inspect sheets of Allplastics Metaline Splashbacks for obvious signs of damage during transport or handling. Do not fabricate damaged sheets unless the damaged section can be removed. Always check that the protective film on the decorated surface is free from any drag marks or deep scratches that may penetrate into the coated surface.

Check that all sheets of the same colour are from the same batch code (printed onto the back of the sheet) to ensure that colour differences are minimised. Remember to note down the product batch code for completion of the warranty and installation checklist.

Cutting Metaline Sheets

Allplastics Metaline Splashback sheets are best fabricated on a solid work platform (bench or stable board that fully supports the length of the sheet). Avoid cutting where the panel is only supported by trestles or bearers. Movement of the panel during the cutting process must be avoided to ensure accurate dimensional finish and prevent damage.

Allplastics Metaline Splashback sheets must be cut with a downward cutting stroke on the decorated surface. Always ensure that the workplace is kept free of swarf and other hard objects that may damage the Allplastics Metaline Splashback surface.

Table Saw/Panel Saw

A table saw (eg Altendorf) cuts with a downward direction of the blade, thus the decorated surface must be upwards. This ensures that the cut edge of the sheet is not burred by the exit stroke of the blade. It also eliminates chipping of the decorated coating. A flat metal file can be used to clean up any fine burrs on the cut edge.
Care must be taken to ensure that no swarf or other hard objects become jammed between the saw and the decorated surface, as they can potentially scratch the surface.

Hand-held Circular Saw

A circular saw cuts with an upward direction of the blade, thus the decorated surface must be downwards. Take care in all cutting situations where the decorated face is downwards as you are unable to check for swarf and other debris between the sheet and the supporting table.

Hand Held Router

A hand held router cuts with a sideways action, however because of the high level of dragging during operation, the decorated side should be downwards. Always use a vacuum extraction on a router to prevent swarf build-up around the collet. If vacuum is not available, stop regularly and clear the swarf.

CNC or milling Machine

Same as hand held router.

Jigsaw

A jigsaw cuts with an upward action, so the panel should be cut with the decorated face down. Note that a fine metal cutting blade must be used to prevent chipping and burring of the cut edge. Clean up with a file.

Handsaw

A handsaw can be used for cutting Metaline but must have a dedicated metal cutting blade (eg hacksaw or fine tenon saw). These saws typically cut in one direction – set the blade direction (if possible) to the push stroke. Cut with the decorated face upwards.

Hole saw and drills

Cut with the decorated face upwards. Regularly remove the saw to allow the swarf to be ejected.

SECTION 5: *kitchen splashbacks installations*

SECTION 5: *kitchen splashbacks installations*

Sheet Inspection

Items Required for Installation of Allplastics Metaline Splashbacks

- Double-sided tape – 3MVHB 4991 tape or 3M Scotchtape 4008 (or equivalent) in minimum 12.5mm width,
- Neutral Cure silicone – Allplastics Metaline neutral cure silicone in translucent
- Silicone application gun
- Glazier's suction cup x 2
- Straight edge
- Builders angle
- Measuring tape
- Scraper or similar
- Plaster patching compound
- Plasterboard saw
- Fixing screws – 25mm length, self tapping
- Utility knife
- 3mm packers
- AllplasticsMetaline Splashback panels
- 9mm calcium silicate mineral board – Allplastics Metaline Splashback Calcium Silicate board (not required for installations where Allplastics Metaline Splashbacks are installed directly onto rendered brick and/or cement brick walls)

Important Note: Minimum installation distance for gas and electric cooktops

For all inbuilt gas and electric cooktops – Allplastics Metaline Splashbacks must be installed with a **minimum of 30mm** set back from the rear of the cooktop. This applies to all gas, electric and induction cooktops. The minimum benchtop width suitable for Allplastics Metaline Splashback installation is 600mm.

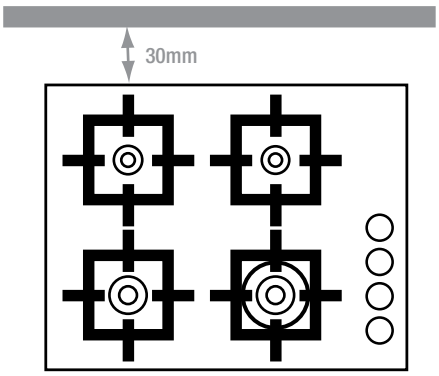


Figure 1: Gas Hotplate clearances

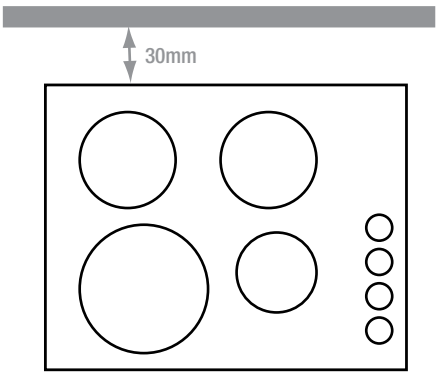


Figure 2: Electric Hotplate clearances

Installations where these minimum distances are not observed creates a risk of impact damage from the use of oversized cooking pots and will void the Allplastics Metaline Splashbacks limited warranty.

All Cooktop Installations

Gas and Electric Cook tops require the installation of Allplastics Metaline Calcium Silicate mineral board directly behind the cooktop to provide additional heat protection for the wall structure and ensure compliance with the relevant BCA/ BCNZ requirements, as well as CodeMark certification. The Allplastics Metaline Calcium Silicate mineral board must be installed to a minimum height of 150mm above the benchtop level across the full width of the cooktop. This can be seen in Figures 3-7.

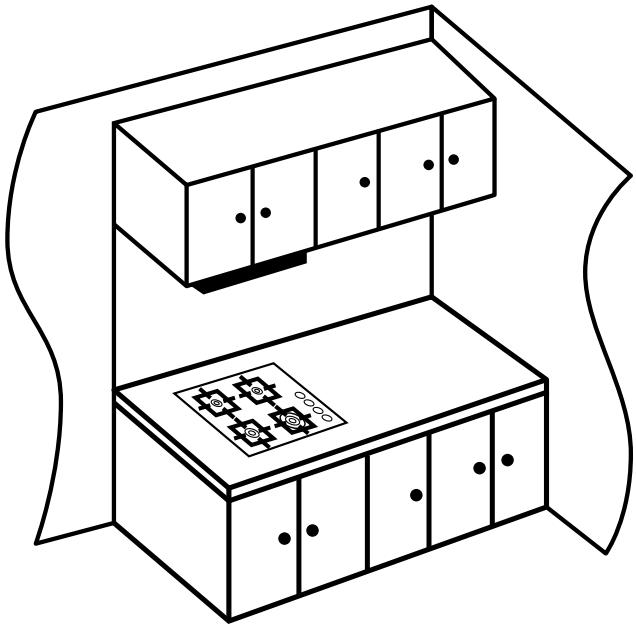


Figure 3: Kitchen layout

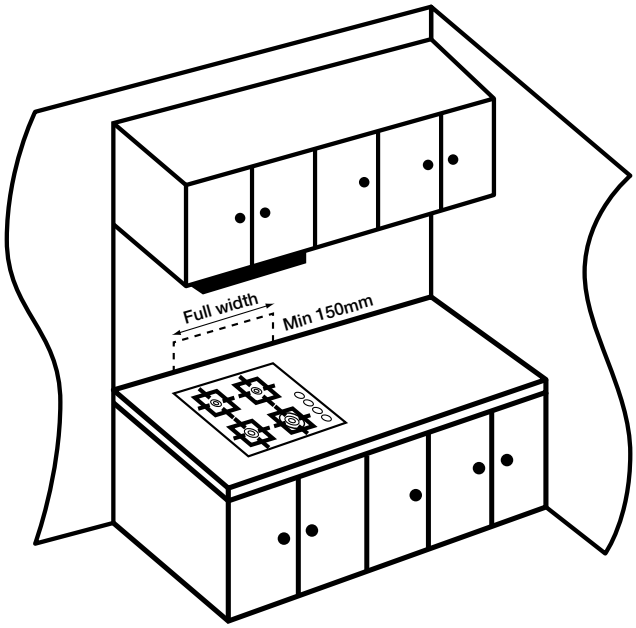


Figure 4: Mark out mineral board position directly behind cooktop and to minimum height of 150mm above the benchtop

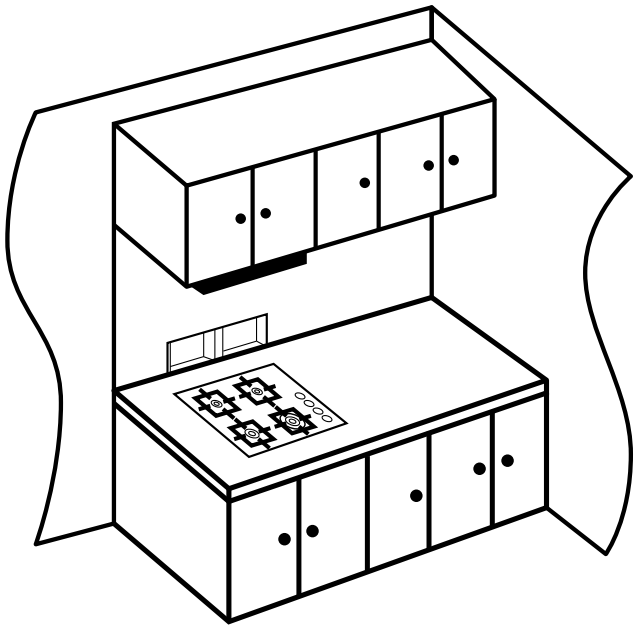


Figure 5: Remove of plasterboard behind cooktop with plasterboard saw, exposing stud wall

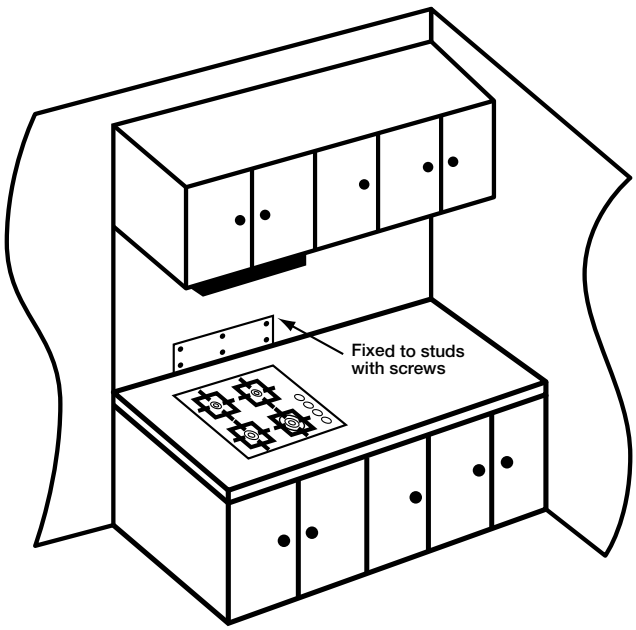


Figure 6: Installation of mineral board onto stud wall with self-tapping screws into the studs

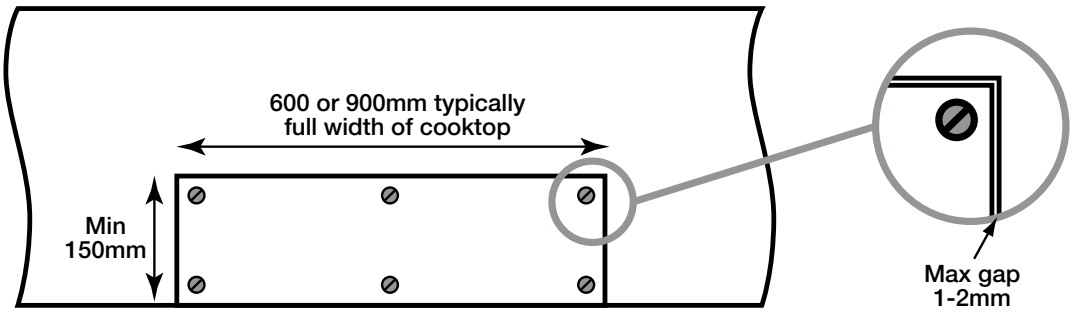


Figure 7: Detailed installation of mineral board with self-tapping screws showing allowable gaps

Allplastics supplies 9mm calcium silicate board with all Allplastics Metaline Splashback panels. Substitute mineral boards must not be used. Installation of 9mm calcium silicate board not required where Allplastics Metaline Splashbacks are installed directly onto rendered brick and/or cement brick walls.

Surface preparation – plaster board & cement sheet

The wall area must be a dry and clean surface, free from any crumbling plasterwork, grease or major surface damage. Crumbling plasterwork should be removed with a scraper blade or sanded off, or if severe, it must be repaired with plaster filler or patched with a suitable piece of plasterboard. Grease should be removed with isopropanol (IPO) or thinners and wiped dry. All nail heads must be punched in. Residual glue or plaster filler should be sanded or scraped off.

Surface preparation – bricks or cement blocks, grey coat render or white coat plaster

The wall area must be a dry and clean surface, free from any crumbling plaster, mortar, sand, grease or major surface damage. Crumbling plaster should be removed with a scraper blade or sanded off, or if severe, it must be repaired with plaster filler. Grease should be removed with isopropanol (IPO) or thinners and wiped dry. Residual mortar or plaster filler should be sanded or scraped off. Sandy or loose render on brickwork or cement blockwork must be sealed with appropriate sealer/primer. (The Allplastics Group recommends ArdexP51 Porous Substrate Primer. Follow manufacturer's application instructions.)

Any holes larger than 100mm across must patched or filled. Electrical or plumbing penetrations should be cut to slightly oversized for ease of installation, however they should not be excessively oversized to ensure wall integrity.

Figure 8 should be used as a reference for the recommended repair method for any damage to the wall.

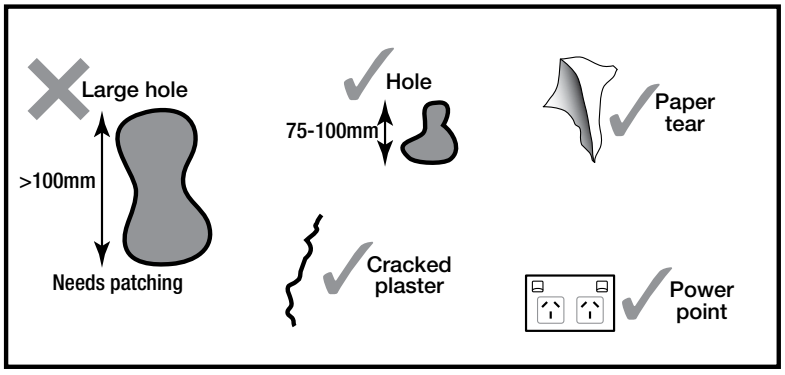


Figure 8: Wall damage and recommended repair requirements

Wall Flatness and Squareness

The wall area should be checked for flatness and squareness before any splashback dimensions are taken. Areas requiring packing out should be identified and corrected. It is recommended to use double-sided tape as the method for packing out low sections of the wall. Tolerance for wall flatness is + /- 2mm/m vertically and horizontally. Wall squareness is +/- 5° from a right angle (90°).

Dimensional measurement

Wall dimensions should be taken after wall preparation and/or corrections are complete. Measurements are to be to the nearest 1mm, with allowance for diagonal variations. Check all measurements before transferring to the Allplastics Metaline Splashbacks surface. (Refer to Fabrication section for the most suitable method of cutting to size).

Dimensions will depend on the selected method of installation (viz. folded vs butt joined method).

Taping

Double-sided tape must be used to provide initial adhesion during the installation process. Allplastics recommends the use of 12.5mm minimum width, 3M VHB 4991 or 3M Scotchtape 4008 tape to assist in the installation process.

The double-sided tape performs 2 key functions:

- Provides initial adhesion of panel to the wall during silicone cure.
- Allows adjustment of the wall flatness to pack the panel out for plumb fit.

Double-sided tape should be applied vertically, spaced every 450mm across the width of the panel, and down the full length of the wall. **Do not remove the protective strip from the tape until after the dry fit of the panel.** Figure 9 outlines the correct double-sided tape installation method.

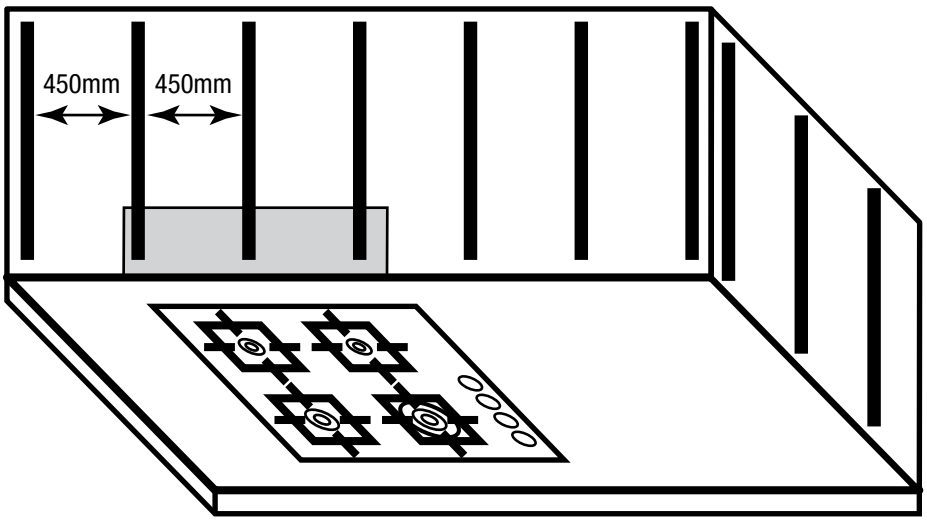
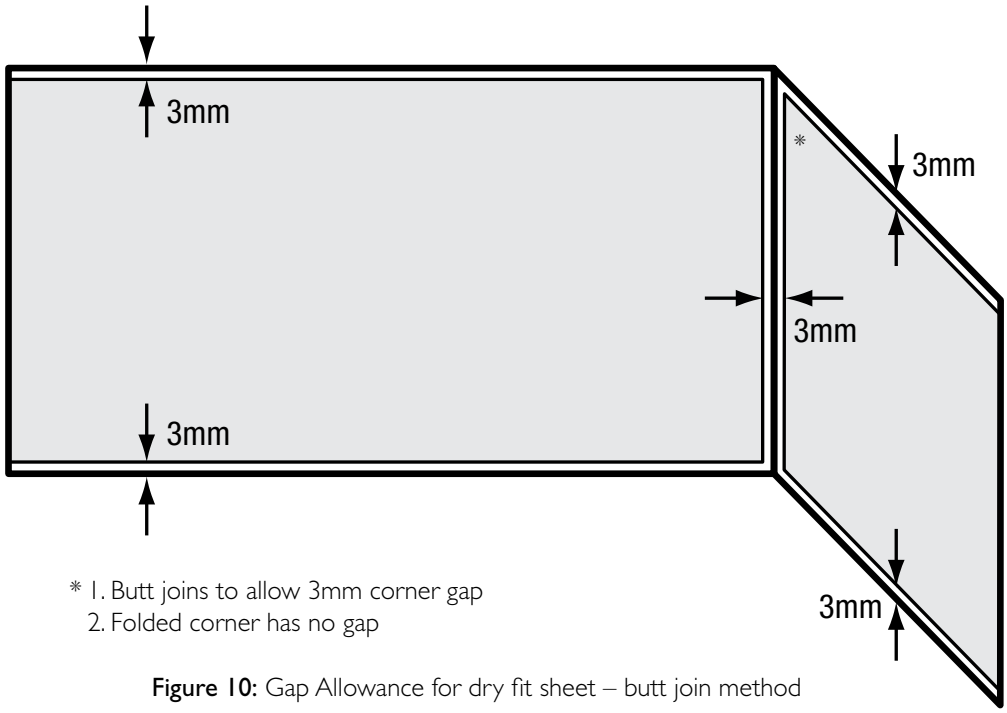


Figure 9: Application of double-sided tape to the wall

Dry Fit

Allplastics Metaline Splashbacks should be dry fitted to the wall to check dimensional accuracy. The use of glazier's suction cups will assist in the handling of the Metaline panels. Once a satisfactory fit is achieved, the panel should be removed to allow for silicone application.

Figure 10 shows the recommended dry fit gaps.



* 1. Butt joins to allow 3mm corner gap
2. Folded corner has no gap

Figure 10: Gap Allowance for dry fit sheet – butt join method

Final Fitting

a). Silicone Adhesive Application

A 5mm bead of Allplastics Metaline neutral cure silicone adhesive should be applied to the wall using a zigzag pattern between the strips of double-sided tape. Figure 11 shows the recommended application pattern.

Ensure an even coverage of the silicone to ensure wall flatness. DO NOT use dollops of adhesive as they can create an uneven wall finish. The use of zigzag type patterns ensures an even bond of the Metaline Splashback panel to the wall.

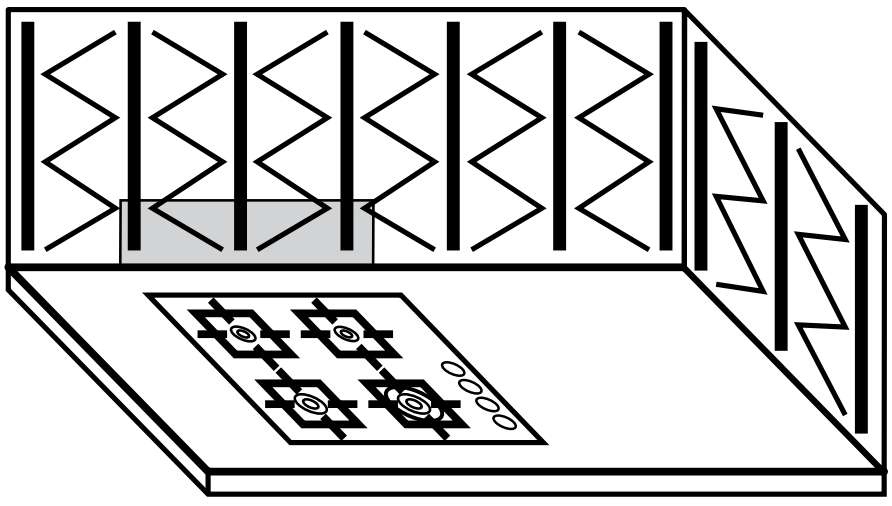


Figure 11: Application pattern for silicone

b). Double-sided tape protective strip removal

Remove all of the protective strips from the double-sided tape, ready for panel installation. Make sure all the protective strips are removed, as there will not be an opportunity to remove once the panel is pressed onto the wall.

c). Fitting

Install the panel against the wall, pressing firmly and evenly against the silicone bead until resistance from the double-sided tape is experienced. **Note: Where a folded panel method is used, both adjacent walls must be considered at the same time to ensure the panel is tightly fitted into the corner – so start at the corner.**

Ensure the whole panel is pressed evenly and check vertical trueness with a spirit level. Ensure gaps between the panel and overhead cabinets or benchtops are even. Allowance of 3mm is required at each edge for silicone sealing. Figure 12 illustrates the installation process for a folded panel.

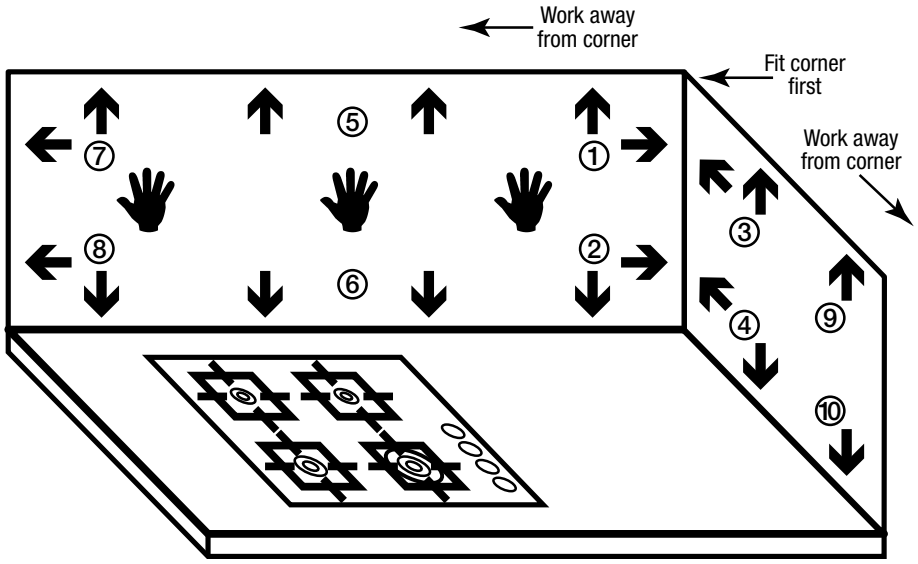


Figure 12: Sequence of panel pressing onto the wall – folded corner method

Butt joining of panels together requires a 3mm gap between panels for silicone sealing. Each panel is installed and pressed separately, starting at one edge and working to the other. Corners require a 3mm gap to be left for silicone sealing. Figure 13 illustrates the installation process for a butt joined panel.

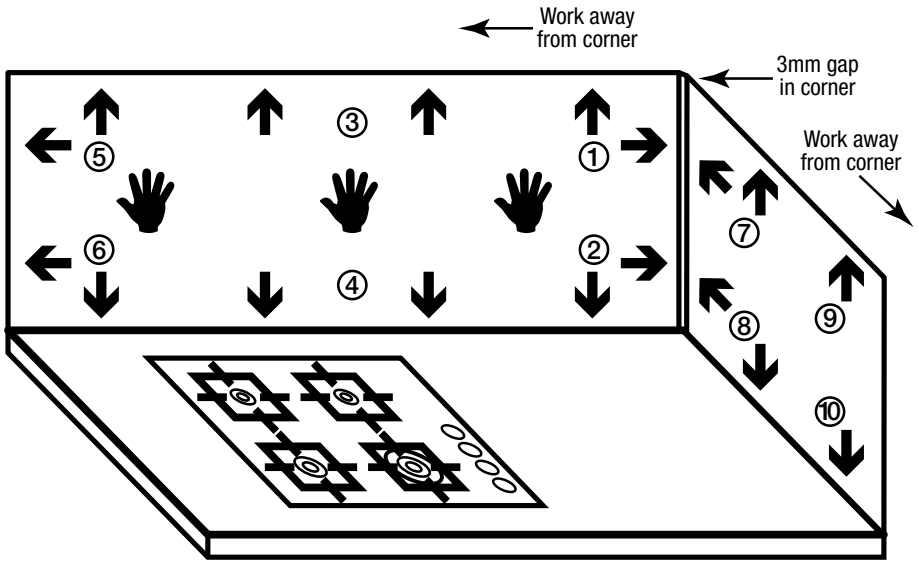


Figure 13: Sequence of panel pressing onto the wall – butt join method

For straight panel joins, simply allow 3mm gap between sheets to allow for silicone sealing.

Removal of Protective Film

Once the panels have been installed onto the wall and all gaps are checked for spacing, the protective film can be removed. Take care to remove the protective film gently – DO NOT rip it from the panel with excessive force or it may move the sheet. Peel with a constant force and from one corner to the diagonal opposite. Figure 14 illustrates this.

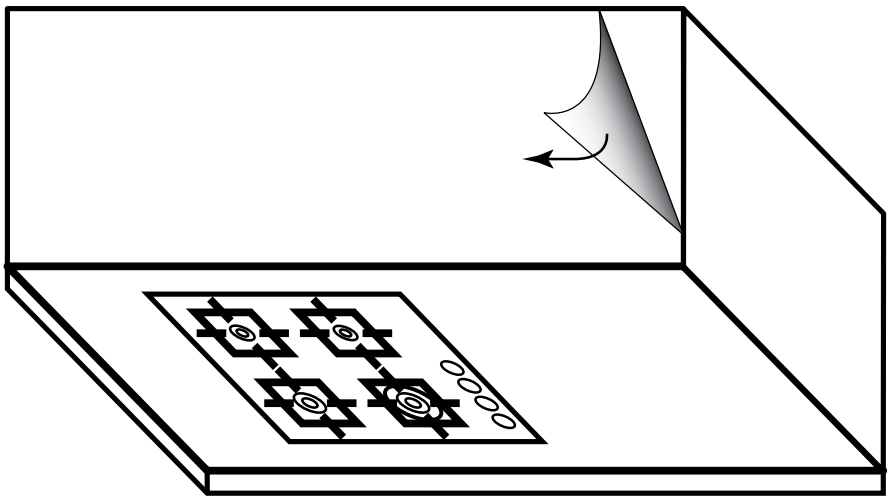


Figure 14: Removal of protective film

Sealing with Silicone

Apply the silicone into the gap between each panel, and between panels and overhead cabinets/benchtops; ensuring that sufficient silicone is used to completely fill the gap, with a small amount of excess silicone squeezing out of the join.

Clean-up

Use water with a small amount of detergent and a soft micro-fibre cloth to clean up any excess silicone from the decorated surface **before** it cures.

Care

Allplastics Metaline Splashbacks require very little maintenance if installed according to the instructions above and cleaned according to the following guidelines:

- DO use a soft micro-fibre cloth with a mild detergent
- DO clean the surface regularly
- DO NOT allow food stuffs to build up on the surface
- DO NOT use abrasive cleaners or pot scrubbing pads
- DO NOT use cleaning solutions that are highly acidic or caustic
- DO NOT clean the surface if it is hot
- DO NOT place metallic or sharp implements against the surface, which may cause scratching

5/10

For more information visit **www.allplastics.com.au** or call **(02) 9471 6111.**

ALLPLASTICS
ARCHITECTURAL & BUILDING

Contact us
Tel. (02) 9417 6111 Fax. (02) 9417 6169
Web. www.allplastics.com.au
Address. Unit 20/ 380 Eastern Valley Way,
Chatswood, NSW 2067 AUSTRALIA.

ALLPLASTICS METALINE®
SPLASHBACKS AND PANELS

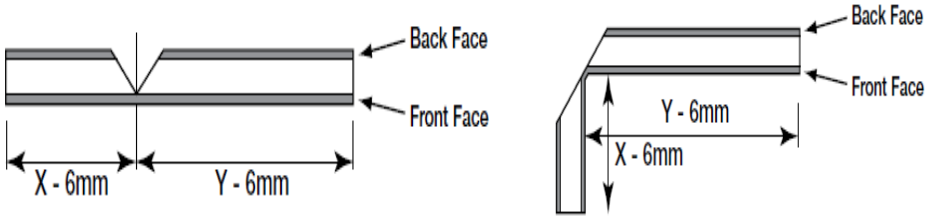
Metaline Router Bit Information

Metaline Router Cutters are not supplied by The Laminex Group. However Metaline Authorised fabricators may wish to purchase the router bits directly from the below supplier

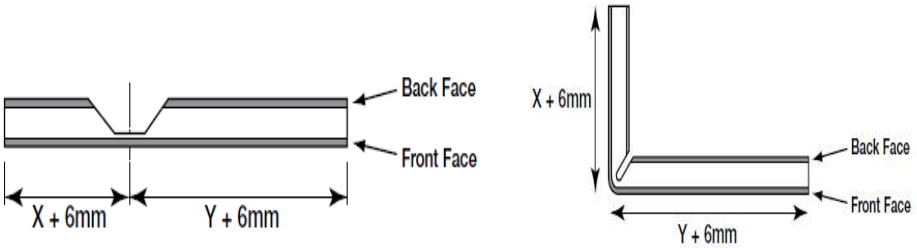
Allplastics Engineering Pty Ltd.

Tel. (02) 9417 6111 Fax. (02) 9417 6169
Web. www.allplastics.com.au
Address. Unit 20/ 380 Eastern Valley Way,
Chatswood, NSW 2067 AUSTRALIA.

Tungsten Carbide – Carbi-tool
Internal Corners – 90 degree V Bit T112



Tungsten Carbide – Carbi-tool
External Corners – 3mm flat T128 – ½" 35 degree



ALLPLASTICS METALINE®
SPLASHBACKS AND PANELS

Appendix 1 – Suitable Uses for Metaline Panels in all Building Classes

Class of Building	Type of Dwelling	Suitable applications	Examples	Excluded applications
Domestic Applications				
Class 1a	i. a detached house; or ii. one or more dwellings each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit.	All applications	Kitchens, bathrooms, wall linings, inserts for doors, laundries, external panels, alfresco areas, toilets, ceiling panels	Nil
Class 1b	A boarding house, guesthouse, hostel or the like, not exceeding 300m2 and in which not more than 12 persons would be resident	Most applications	As above	Wall or ceilings in fire isolated exits
Commercial Applications				
Class 2	Building containing 2 or more units	Most applications	As above + lifts	Wall or ceilings in fire isolated exits
Class 3	Residential building, other than class 1 or 2 which is a common place of long term or transient living for a number of persons, including: (a) a boarding house, guest house, hostel, lodging house or backpackers accommodation; or (b) a residential part of a hotel or motel; or (c) a residential part of a school; or (d) accommodation for the aged, children or people with disabilities; or (e) a residential part of a health-care building which accommodates members of staff; or (f) a residential part of a detention centre.	Most applications	Wall linings, kitchens, bathrooms and wet areas, ceiling linings + lifts	Wall or ceilings in fire isolated exits, unsprinklered public corridors
Class 4	a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building	Most applications	Walls, wet areas, toilets	Wall or ceilings in fire isolated exits
Class 5	an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	Most applications	Walls, ceilings, fittings, furniture + lifts	Wall or ceilings in fire isolated exits
Class 6	a shop, or other building for the sale of goods by retail or the supply of services direct to the public, including	Most applications	Walls, toilets, furniture, kitchens, wet areas, shop	Wall or ceilings in fire isolated exits

	(i) an eating room, café, restaurant, milk or soft-drink bar; or (ii) a dining room, bar, shop or kiosk part of a hotel or motel; or (iii) a hairdresser's or barber's shop, public laundry, or undertakers establishment; or (iv) (iv) market or sale room, showroom or service station		fittings, point of sale, displays	
Class 7a	Car park	Not applicable		
Class 7b	For storage, or display of goods or produce for sale by wholesale	Most applications	Walls, toilets, furniture, kitchens, wet areas, shop fittings, point of sale, displays	Wall or ceilings in fire isolated exits
Class 7b	For storage, or display of goods or produce for sale by wholesale	Most applications	Walls, toilets, furniture, kitchens, wet areas, shop fittings, point of sale, displays	Wall or ceilings in fire isolated exits
Class 8	a laboratory or a building in which a handicraft or process of the production, assembling, altering, repairing packing, finishing, or cleaning of goods or produce is carried out for trade, sale or gain.	Not applicable		
Class 9a	a health-care building; including those parts of the building set aside as a laboratory	Most applications	Wall linings, treatment rooms, wet area, furniture, ceilings, some shielding applications + lifts	Wall or ceilings in fire isolated exits, unsprinklered public corridors
Class 9b	an assembly building, including a trade workshop, laboratory or the like in a primary or secondary school, but excluding any other parts of the building that are of another class	Most applications	Wall linings, wet areas, ceilings	Wall or ceilings in fire isolated exits, unsprinklered public corridors
Class 9c	an aged care building	Most applications	Wall linings, treatment rooms, wet area, furniture, ceilings, some shielding applications + lifts	Wall or ceilings in fire isolated exits
Class 10	a non-habitable building or structure	Not applicable		

Metaline® Splashbacks and Panels

Metaline Splashbacks and Panels is an advanced fire retardant aluminium composite panel. It features a high gloss paint system, combined with a proprietary surface coating that is easy to clean and is mark, stain and fire resistant.

The coated aluminium sheets are 0.5mm thick, sandwiched onto a 3mm FR core to give a total thickness of 4mm.
A protective plastic film protects the decorated surface, during handling.

Metaline Splashbacks and Panels are CodeMark certified by SAI Global as meeting the requirements of the Building Code of Australia (BCA)
1. Volume One - C1.10
(Specification C1.10, Clause 4)
2. Volume Two - P2.3.1 SAP2.3.1 (a) (ii) & (iii) (when installed according to the Metaline Splashback – Fabrication Manual).

APPLICATIONS

Metaline Splashbacks and Panels is suitable for kitchen splashback applications. It can be safely installed behind both gas and electric cook tops when installed according to the requirements as stated in the "Metaline - Fabrication Manual". It has a flame resistant coating with a fire retardant core. It can also be used in many vertical applications, such as wall panels and wet area applications

COLOURS

Metaline Splashbacks and Panels come in a number modern colours to meet your designer needs. Please check with the colour chart for colour selection.

FINISH

Metaline Splashbacks and Panels come with a high gloss finish over a solid colour or metallic coating. This finish is resistant to stains, fine scratches and heat. It is specifically designed to be easy to clean. The minimum gloss of the decorated surface is 80 gloss units.

SHEET SIZES

Metaline Splashbacks and Panels is available in two main panels sizes:
- 3600mm x 1500mm, and
- 3600mm x 800mm
- 3600mm x 1250mm only available in 'Reflections'

WEIGHT OF PANELS

Metaline Splashbacks and Panels weigh 7.5kg/m^2.
- 3600mm x 1500mm panel weighs 41kgs,
- 3600mm x 800mm panel weighs 22kgs.
- 3600mm x 1250mm panel weighs 34kgs.

Both sheets require a 2-man lift or mechanical assistance.

CODEMARK™ ®
SAIG-CM20030

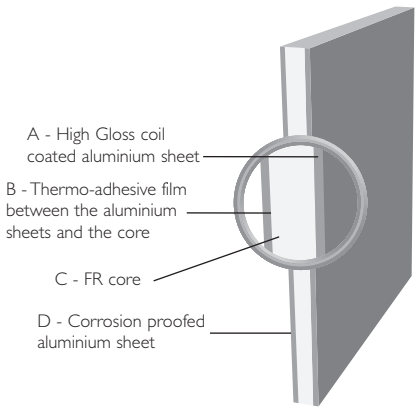
PRODUCT SURFACE PROPERTIES

Metaline Splashbacks and Panels have been extensively tested by a NATA accredited technology centre. Its properties are as follows:

Property	Result
Fire Indices - (AS/NZS 1530.3)	0,0,0,0-4
Fire Classification (AS ISO 9705)	Group 2
Dry Heat Resistance (AS/NZS 2924.2)	180 °C for 20 minutes – no effect
Steam Resistance (AS/NZS 2924.2)	30 minutes – no effect
Chemical Resistance (AS/NZS 2924.2 - Grps 1-4)	No effect
Thermal Conductivity @ 200 °C – METALINE	0.574 W/m-K
Thermal Conductivity @ 200 °C – METALINE + mineral board*	0.096 W/m-K
Thermal Resistance @ 200 °C – METALINE	0.007 m^{2}K/W
Thermal Resistance @ 200 °C – METALINE + mineral board*	0.102 m^{2}K/W
Scratch Resistance	0.8N
Gloss (AS/NZS 1580.602)	Min 80 gloss units at 60°
Coefficient of thermal expansion	2.36 x 10^{-5} m/°C (0.0236 mm/m/°C).

* when installed as per "Kitchen Splashbacks Installation" section in "Metaline Splashbacks - Fabrication Manual"

PRODUCT STRUCTURE



PRODUCT TOLERANCES

Property	Result/ Tolerance
Thickness tolerance	+/- 0.1 mm
Width tolerance	-0/ + 3 mm
Length tolerance	-0/ + 4mm
Difference between diagonals	Max 3 mm

PRODUCT INSTALLATION

Metaline Splashbacks and Panels can be installed directly onto plasterboard or cement sheet using double sided tape and neutral cure silicone adhesive. It can be installed directly onto brickwork and cement blocks using double sided tape and construction adhesive or silicone.

Where the installation is behind a gas or electric hot plate, refer to the "Metaline - Fabrication Manual" for minimum clearance details and mineral board installation. (Installation directly onto brickwork or cement blocks does not require the installation of mineral board).

There are two methods of installing Metaline Splashbacks and Panels. The preferred method includes folded corners and rolled edges. An alternative method is butt joined corners and straight cut edges. Further details can be found in the "Metaline – Fabrication Manual"

SUPPLY AND WARRANTY

Metaline Splashbacks and Panels are supplied only through authorised fabricators.

The product is covered by a 7 year limited warranty by The Group when fabricated and installed according to the Installation Manual.

MAINTENANCE

Metaline Splashbacks and Panels are easy to clean using just a soft microfiber cloth and warm soapy water. Clean the surface regularly to avoid food residue buildup. Always clean the surface when it is cold – never hot.

Never use abrasive pads, scourers or chemicals to clean Metaline. Doing so will void the warranty.

STAIN & SOLVENT RESISTANCE

Stain Agent	Result
BAM	No effect (10 mins)
Plexus	No effect (10 mins)
Spray & Wipe	No effect (10 mins)
Armorall glass cleaner	No effect (10 mins)
Pineoclean	No effect (10 mins)
Windex	No effect (10 mins)
Windex Shower	No effect (10 mins)
Acetone	No effect (50 double rubs)
Coffee (@ 60°C)	No effect (10 mins)
Butter (@ 60°C)	No effect (10 mins)
Tomato soup (@ 60°C)	No effect (10 mins)
Chicken soup (@ 60°C)	No effect (10 mins)
Mr Muscle caustic oven cleaner	No effect (10 mins)
Mr Muscle non-caustic oven cleaner	No effect (10 mins)
25% NaOH	No effect (10 mins)
30% Hydrogen Peroxide	No effect (10 mins)
30% acetic acid	No effect (10 mins)
5% Bleach	No effect (10 mins)
3.6% HCl	No effect (10 mins)
Iodine	No effect (10 mins)
Shoe polish	No effect (10 mins)
Hair dye	No effect (10 mins)
Boric acid (ant rid)	No effect (10 mins)
10% Citric acid (test B)	20 minutes
5% Acetic acid (test B)	20 minutes

Solvent	Result
Methylated spirits	No effect
Mineral turpentine	No effect
Kerosene	No effect
Acetone	No effect (50 double rubs)
Isopropyl alcohol	No effect
Ethyl acetate	No effect
Toluene/ MEK/ Xylene/ 1-2 dichloroethane	Damages surface

METALINE SPLASHBACKS

Chemwatch Independent Material Safety Data Sheet
Issue Date: 24-Nov-2011
A317LP

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
METALINE SPLASHBACKS

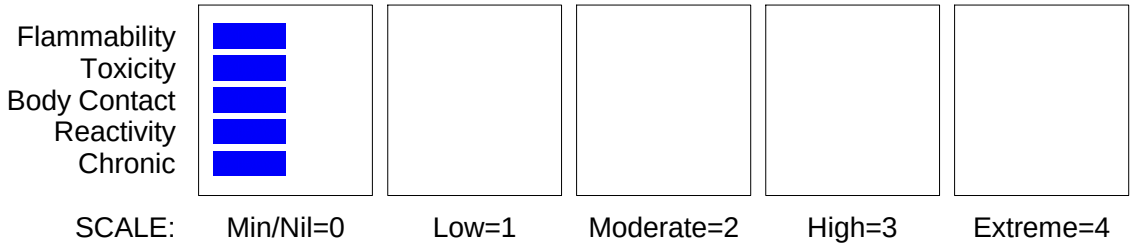
PRODUCT USE
■ Used according to manufacturer's directions.
Architectural panels, specialty applications.

SUPPLIER
Allplastics Engineering Pty. Ltd.
Tel. (02) 9417 6111 Fax. (02) 9417 6169
Web. www.allplastics.com.au
Address. Unit 20/ 380 Eastern Valley Way,
Chatswood, NSW 2067 AUSTRALIA.

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to NOHSC Criteria, and ADG Code.

CHEMWATCH HAZARD RATINGS



RISK
•None under normal operating conditions.

continued...

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
architectural panel consisting of		
aluminium face sheets		
polymeric core		
coating		
which include the following components		
aluminium	7429-90-5	
magnesium	7439-95-4	
manganese	7439-96-5	
thermoplastic polymer		
fire retardant		
aramid polymer		
chromium compounds		
nickel compounds		
antimony compounds		
silica amorphous	7631-86-9	
carbon black	1333-86-4	
cobalt compounds		
copper compounds		
titanium dioxide	13463-67-7	
lead compounds including		
lead chromate	7758-97-6	

Section 4 - FIRST AID MEASURES

SWALLOWED
■ - Generally not applicable.

EYE
■ - Generally not applicable.

SKIN
■ - Generally not applicable.

INHALED
■ - If fumes, aerosols or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN
■ Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
■ - There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

FIRE FIGHTING
■ - Use water delivered as a fine spray to control fire and cool adjacent area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

continued...

FIRE/EXPLOSION HAZARD
■ - Non combustible.
- Not considered a significant fire risk, however containers may burn.
Decomposition may produce toxic fumes of: metal oxides.

FIRE INCOMPATIBILITY
■ None known.

HAZCHEM
None

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
■ - Clean up all spills immediately.
- Secure load if safe to do so.
- Bundle/collect recoverable product.
- Collect remaining material in containers with covers for disposal.

MAJOR SPILLS
■ - Clean up all spills immediately.
- Secure load if safe to do so.
- Bundle/collect recoverable product.
- Collect remaining material in containers with covers for disposal.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
■ - Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

SUITABLE CONTAINER
■ No restriction on the type of containers. Packing as recommended by manufacturer. Check all material is clearly labelled.

STORAGE INCOMPATIBILITY
■ Avoid reaction with.
strong acids.

STORAGE REQUIREMENTS
■ Store away from incompatible materials.

continued...

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA mg/m³	STEL mg/m³	Notes
Australia Exposure Standards	aluminium (Emery (dust) (a))	10		(see Chapter 14)
Australia Exposure Standards	aluminium (Aluminium (welding fumes) (as Al))	5		
Australia Exposure Standards	aluminium (Aluminium (metal dust))	10		
Australia Exposure Standards	manganese (Manganese, fume (as Mn))	1	3	
Australia Exposure Standards	manganese (Manganese, dust & compounds (as Mn))	1		
Australia Exposure Standards	silica amorphous (Silica - Amorphous Fumed silica (respirable dust))	2		(see Chapter 14)
Australia Exposure Standards	carbon black (Carbon black)	3		
Australia Exposure Standards	lead chromate (Lead chromate (as Cr) (h))	0.05		

EMERGENCY EXPOSURE LIMITS

Material	Revised	IDLH
manganese|21862	500	
silica amorphous|10451	3, 000	
carbon black|13230	1, 750	
titanium dioxide|10971	5, 000	
lead chromate|22612	100	

MATERIAL DATA

MAGNESIUM:
METALINE SPLASHBACKS:
TITANIUM DIOXIDE:

■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:
- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

continued...

ALUMINIUM:

■ For aluminium oxide and pyrophoric grades of aluminium:

Twenty seven year experience with aluminium oxide dust (particle size 96% 1,2 um) without adverse effects either systemically or on the lung, and at a calculated concentration equivalent to 2 mg/m3 over an 8-hour shift has lead to the current recommendation of the TLV-TWA.

The limit should also apply to aluminium pyro powders whose toxicity is reportedly greater than aluminium dusts and should be protective against lung changes.

For aluminium oxide:

The experimental and clinical data indicate that aluminium oxide acts as an "inert" material when inhaled and seems to have little effect on the lungs nor does it produce significant organic disease or toxic effects when exposures are kept under reasonable control.

[Documentation of the Threshold Limit Values], ACGIH, Sixth Edition.

MAGNESIUM:

■ It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

MANGANESE:

■ Ceiling values were recommended for manganese and compounds in earlier publications. As manganese is a chronic toxin a TWA is considered more appropriate. Because workers exposed to fume exhibited manganism at air-borne concentrations below those that affect workers exposed to dust a lower value has been proposed to provide an extra margin of safety. This value is still above that experienced by two workers exposed to manganese fume in the course of one study.

A number of studies have shown that susceptibility to the effects of manganese at or about 1 - 5 mg/m3 (TWA) can lead to clinical manifestations of manganism or more commonly to the development of indicators of sub-clinical manganism (e.g. hand tremor, exaggerated reflexes, short-term memory deficits, poor psychomotor performance). Controlling long-term exposure to the recommended ES TWA level or below should provide protection for those individuals susceptible to neurological effects of prolonged exposure.

SILICA AMORPHOUS:

■ The concentration of dust, for application of respirable dust limits, is to be determined from the fraction that penetrates a separator whose size collection efficiency is described by a cumulative log-normal function with a median aerodynamic diameter of 4.0 µm (+-) 0.3 µm and with a geometric standard deviation of 1.5 µm (+-) 0.1 µm, i.e..generally less than 5 µm.

For amorphous crystalline silica (precipitated silicic acid):

Amorphous crystalline silica shows little potential for producing adverse effects on the lung and exposure standards should reflect a particulate of low intrinsic toxicity. Mixtures of amorphous silicas/ diatomaceous earth and crystalline silica should be monitored as if they comprise only the crystalline forms.

The dusts from precipitated silica and silica gel produce little adverse effect on pulmonary functions and are not known to produce significant disease or toxic effect.

IARC has classified silica, amorphous as Group 3: NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

CARBON BLACK:

■ The TLV-TWA for carbon black is recommended to minimise complaints of excessive dirtiness and applies only to commercially produced carbon blacks or to soots derived from combustion sources containing absorbed polycyclic aromatic hydrocarbons (PAHs). When PAHs are present in carbon black (measured as the cyclohexane-extractable fraction) NIOSH has established a REL-TWA of 0.1 mg/m3 and considers the material to be an occupational carcinogen.

The NIOSH REL-TWA was "selected on the basis of professional judgement rather than on data delineating safe from unsafe concentrations of PAHs".

This limit was justified on the basis of feasibility of measurement and not on a demonstration of its safety.

continued...

TITANIUM DIOXIDE:

■ Animals exposed by inhalation to 10 mg/m3 titanium dioxide show no significant fibrosis, possibly reversible tissue reaction. The architecture of lung air spaces remains intact.

LEAD CHROMATE:

■ The lead concentration in air is to be maintained so that the lead concentration in workers' blood remains below 0.060 mg/100 g of whole blood. The recommended TLV-TWA has been derived following a review of reports of adverse effects on reproduction, blood-pressure and other end-points of toxicity. A particular focus was an assessment of pre-natal blood lead (PbB) levels and post-natal cognitive levels. The fact that lead is a cumulative toxicant which can produce subtle, persistent and apparently permanent effects in the off-spring of lead exposed women is of particular concern. A current view holds that the identification of the PbB levels, that are protective during a working lifetime, is a necessary prerequisite in the recommendation of the TLV because PbB values, rather than workplace air lead concentrations, are more clearly related to adverse health effects.

(see Biological Exposure Index - BEI - in "Advice to Doctor".).

for lead chromate:

The TLV-TWA expressed as lead is recommended to minimise the potential from adverse health effects arising from exposure to lead. At this concentration the excess risk for lead and chromate induced cancers should also be reduced.

PERSONAL PROTECTION

EYE

■ No special equipment required due to the physical form of the product.

HANDS/FEET

■ - Protective gloves eg. Leather gloves or gloves with Leather facing.

OTHER

■ Overalls.

RESPIRATOR

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

continued...

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Coloured solid panels with no odour.

PHYSICAL PROPERTIES
Does not mix with water.
Sinks in water.

State	Manufactured	Molecular Weight	Not Applicable
Melting Range (℃)	104 (polymer); 482-649 (aluminium)	Viscosity	Not Applic able
Boiling Range (℃)	Not Applicable	Solubility in water (g/L)	Immiscible
Flash Point (℃)	Not Applicable	pH (1% solution)	Not Applica ble
Decomposition Temp (℃)	Not Available	pH (as supplied)	Not A pplicable
Autoignition Temp (℃)	Not Applicable	Vapour Pressure (kPa)	Not Applicable
Upper Explosive Limit (%)	Not Applicable	Specific Gravity (water=1)	1.10- 2.27
Lower Explosive Limit (%)	Not Applicable	Relative Vapour Density (air=1)	Not Applicable
Volatile Component (%vol)	Not Applicable	Evaporation Rate	Not Applicable

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY
■ Product is considered stable and hazardous polymerisation will not occur.
For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (eg. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE
■ Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN
■ The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

continued...

INHALED
■ The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

CHRONIC HEALTH EFFECTS
■ Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

TOXICITY AND IRRITATION
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TITANIUM DIOXIDE:
MANGANESE:
■ The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

METALINE SPLASHBACKS:
■ Not available. Refer to individual constituents.

ALUMINIUM:
■ No significant acute toxicological data identified in literature search.

MAGNESIUM:

TOXICITY	IRRITATION
Oral (dog) LDLo: 230 mg/kg	Nil Reported [Manufacturer]

MANGANESE:

TOXICITY	IRRITATION
Oral (rat) LD50: 9000 mg/kg	Skin (rabbit): 500 mg/24h - Mild
Inhalation (man) TCLo: 2.3 mg/m³	Eye (rabbit): 500 mg/24h - Mild

■ The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SILICA AMORPHOUS:

TOXICITY	IRRITATION
Oral (rat) LD50: 3160 mg/kg	Skin (rabbit): non- irritating *
Dermal (rabbit) LD50: >5000 mg/kg *	Eye (rabbit): non- irritating *
Inhalation (rat) LC50: >0.139 mg/l/14h * * [Grace]	

■ For silica amorphous:
When experimental animals inhale synthetic amorphous silica (SAS) dust, it dissolves in the lung fluid and is rapidly eliminated. If swallowed, the vast majority of SAS is excreted in the faeces and there is little accumulation in the body. Following absorption across the gut, SAS is eliminated via urine without modification in animals and humans. SAS is not expected to be broken down (metabolised) in mammals. After ingestion, there is limited accumulation of SAS in body tissues and rapid elimination occurs. Intestinal absorption has not been calculated, but appears to be insignificant in animals and humans. SASs injected subcutaneously are subjected to rapid dissolution and removal. There is no indication of metabolism of SAS in animals or humans based on chemical structure and available data. In contrast to crystalline silica, SAS is soluble in physiological media and the soluble chemical species that are formed are eliminated via the urinary tract without modification.
Both the mammalian and environmental toxicology of SASs are significantly influenced by the physical and chemical properties, particularly those of solubility and particle size. SAS has no acute intrinsic toxicity by inhalation. Adverse effects, including suffocation, that have been reported were caused by the presence of high numbers of respirable particles generated to meet the required test atmosphere. These results are not representative of exposure to commercial SASs and should not be used for human risk assessment. Though repeated exposure of the skin may cause dryness and cracking, SAS is not a skin or eye irritant, and it is not a sensitiser.

continued...

Repeated-dose and chronic toxicity studies confirm the absence of toxicity when SAS is swallowed or upon skin contact.
Long-term inhalation of SAS caused some adverse effects in animals (increases in lung inflammation, cell injury and lung collagen content), all of which subsided after exposure.
Numerous repeated-dose, subchronic and chronic inhalation toxicity studies have been conducted with SAS in a number of species, at airborne concentrations ranging from 0.5 mg/m3 to 150 mg/m3. Lowest-observed adverse effect levels (LOAELs) were typically in the range of 1 to 50 mg/m3. When available, the no-observed adverse effect levels (NOAELs) were between 0.5 and 10 mg/m3. The difference in values may be explained by different particle size, and therefore the number of particles administered per unit dose. In general, as particle size decreases so does the NOAEL/LOAEL.
Neither inhalation nor oral administration caused neoplasms (tumours). SAS is not mutagenic in vitro. No genotoxicity was detected in in vivo assays. SAS does not impair development of the foetus. Fertility was not specifically studied, but the reproductive organs in long-term studies were not affected.
In humans, SAS is essentially non-toxic by mouth, skin or eyes, and by inhalation. Epidemiology studies show little evidence of adverse health effects due to SAS. Repeated exposure (without personal protection) may cause mechanical irritation of the eye and drying/cracking of the skin.
There is no evidence of cancer or other long-term respiratory health effects (for example, silicosis) in workers employed in the manufacture of SAS. Respiratory symptoms in SAS workers have been shown to correlate with smoking but not with SAS exposure, while serial pulmonary function values and chest radiographs are not adversely affected by long-term exposure to SAS.
The substance is classified by IARC as Group 3:
NOT classifiable as to its carcinogenicity to humans.
Evidence of carcinogenicity may be inadequate or limited in animal testing.
Reports indicate high/prolonged exposures to amorphous silicas induced lung fibrosis in experimental animals; in some experiments these effects were reversible. [PATTYS]

CARBON BLACK:

TOXICITY	IRRITATION
Inhalation (rat) TCLo: 50 mg/m³/6h/90D- I	Nil Reported
Inhalation (rat) TCLo: 7 mg/m³	
Dermal (rabbit) LD50: >3000 mg/kg	

■ WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

TITANIUM DIOXIDE:

TOXICITY	IRRITATION
Oral (Rat) LD50: >20000 mg/kg *	Skin (human): 0.3 mg /3D (int)- Mild *
Oral (Mouse) LD50: >10000 mg/kg *	

■ The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
Exposure to titanium dioxide is via inhalation, swallowing or skin contact. When inhaled, it may deposit in lung tissue and lymph nodes causing dysfunction of the lungs and immune system. Absorption by the stomach and intestines depends on the size of the particle. It penetrated only the outermost layer of the skin, suggesting that healthy skin may be an effective barrier. There is no substantive data on genetic damage, though cases have been reported in experimental animals. Studies have differing conclusions on its cancer-causing potential.
* IUCLID

LEAD CHROMATE:

TOXICITY	IRRITATION
Oral (mouse) LD50: 12000 mg/kg	Nil Reported

■ WARNING: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.
Lead can cross the placenta, and cause miscarriage, stillbirths and birth defects. Exposure before birth can cause mental retardation, behavioural disorders and infant death. Lead can also cause reduced sex drive, impotence, sterility and damage the sperm of males, increasing the potential for birth defects. Periods in women can also be affected.

continued...

CARCINOGEN

Silica, amorphous	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Carbon black	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2B
Titanium dioxide	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2B
Lead compounds, inorganic	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2A
Chromium (VI) compounds	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1

REPROTOXIN

manganese	ILO Chemicals in the electronics industry that have toxic effects on reproduction	Reduced fertility or sterility	H si

Section 12 - ECOLOGICAL INFORMATION

MAGNESIUM:
MANGANESE:
TITANIUM DIOXIDE:
LEAD CHROMATE:
ALUMINIUM:
■ For Metal:
Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.
Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.
Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms. Ionic species may bind to dissolved ligands or sorb to solid particles in water.
Ecotoxicity: Even though many metals show few toxic effects at physiological pH levels, transformation may introduce new or magnified effects.

MAGNESIUM:

continued...

MANGANESE:
SILICA AMORPHOUS:
CARBON BLACK:
TITANIUM DIOXIDE:
LEAD CHROMATE:
ALUMINIUM:
■ DO NOT discharge into sewer or waterways.

ALUMINIUM:
■ For Aluminium and its Compunds and Salts:
Environmental Fate - As an element, aluminium cannot be degraded in the environment, but may undergo various precipitation or ligand exchange reactions. Aluminium in compounds has only one oxidation state (+3), and would not undergo oxidation-reduction reactions under environmental conditions. Aluminium can be complexed by various ligands present in the environment (e.g., fulvic and humic acids). The solubility of aluminium in the environment will depend on the ligands present and the pH.
Atmospheric Fate: Air Quality Standards: none available.
Aquatic Fate: The hydrated aluminium ion undergoes hydrolysis. The speciation of aluminium in water is pH dependent. The hydrated trivalent aluminium ion is the predominant form at pH levels below 4. Between pH 5 and 6, the predominant hydrolysis products are Al(OH)2+ and Al(OH)2+, while the solid Al(OH)3 is most prevalent between pH 5.2 and 8.8. The soluble species Al(OH)4- is the predominant species above pH 9, and is the only species present above pH 10. Polymeric aluminium hydroxides appear between pH 4.7 and 10.5, and increase in size until they are transformed into colloidal particles of amorphous Al(OH)3, which crystallize to gibbsite in acid waters. When enough silica is present, aluminium is precipitated as poorly crystallized clay mineral species. Hydroxyaluminium compounds can act as both acids and bases in solution. Because of this property, aluminium hydroxides can act as buffers and resist pH changes within the narrow pH range of 4-5. Polymeric aluminium species react slowly in the environment. Aluminium has a strong attraction to fluoride in an acidic environment. Within the pH range of 5 - 6, aluminium complexes with phosphate and is removed from the solution. This may result in depleted nutrient states in surface water.
Terrestrial Fate: Soil - Clay soils may act as a sink or a source for soluble aluminium depending on the degree of aluminium saturation on the clay surface. Soil Guideline: none available. Plants - Plant species and cultivars of the same species differ considerably in their ability to take up and translocate aluminium to above-ground parts. Tea leaves may contain very high concentrations of aluminium, >5,000 mg/kg in old leaves. Other plants that may contain high levels of aluminium include clubmosses (also known as ground pines or creeping cedar), a few ferns, Symplocos (Symplocaceae), and Orites (Proteaceae). Aluminium is often taken up and concentrated in root tissue. In sub-alpine ecosystems, the large root biomass of the Douglas fir takes up aluminium and immobilizes it, preventing large accumulation in above-ground tissue. It is unclear to what extent aluminium is taken up into root food crops and leafy vegetables.
Ecotoxicity: Aluminium is toxic to many aquatic species thus it is not bioaccumulated to a significant degree in most fish and shellfish; therefore, consumption of contaminated fish does not appear to be a significant aluminium exposure in humans. Bioconcentration of aluminium has also been reported for several aquatic invertebrate species. Aluminium is highly toxic to fish, amphibians and planktonic crustaceans. Aluminium can affect the population growth of algal species with single-celled plants generally more sensitive to aluminium. Fish are generally more sensitive to aluminium than aquatic invertebrates due to gill toxication. The inorganic single unit aluminium species (Al(OH)2 +) is thought to be the most toxic At approximately neutral pH values, the toxicity of aluminium is greatly reduced. The solubility of aluminium is also enhanced under alkaline conditions and acute toxicity of aluminium increases from pH 7 to pH 9. However, the opposite relationship was found in other studies. The uptake and toxicity of aluminium in freshwater organisms generally decreases with increasing water hardness under acidic, neutral and alkaline conditions. Complexing agents such as fluoride, citrate and humic substances reduce the availability of aluminium to organisms, resulting in lower toxicity. Silicon can also reduce aluminium toxicity to fish.

MAGNESIUM:

MANGANESE:
■ For manganese and its compounds:
Environmental fate:
It has been established that while lower organisms (e.g., plankton, aquatic plants, and some fish) can significantly bioconcentrate manganese, higher organisms (including humans) tend to maintain manganese homeostasis. This indicates that the potential for biomagnification of manganese from lower trophic levels to

continued...

higher ones is low.
There were two mechanisms involved in explaining the retention of manganese and other metals in the environment by soil. First, through cation exchange reactions, manganese ions and the charged surface of soil particles form manganese oxides, hydroxides, and oxyhydroxides which in turn form absorption sites for other metals. Secondly, manganese can be adsorbed to other oxides, hydroxides, and oxyhydroxides through ligand exchange reactions. When the soil solution becomes saturated, these manganese oxides, hydroxides, and oxyhydroxides can precipitate into a new mineral phase and act as a new surface to which other substances can absorb. The tendency of soluble manganese compounds to adsorb to soils and sediments depends mainly on the cation exchange capacity and the organic composition of the soil. The soil adsorption constants (the ratio of the concentration in soil to the concentration in water) for Mn(II) span five orders of magnitude, ranging from 0.2 to 10,000 mL/g, increasing as a function of the organic content and the ion exchange capacity of the soil; thus, adsorption may be highly variable. In some cases, adsorption of manganese to soils may not be a readily reversible process. At low concentrations, manganese may be "fixed" by clays and will not be released into solution readily. At higher concentrations, manganese may be desorbed by ion exchange mechanisms with other ions in solution. For example, the discharge of waste water effluent into estuarine environments resulted in the mobilization of manganese from the bottom sediments. The metals in the effluent may have been preferentially adsorbed resulting in the release of manganese. The oxidation state of manganese in soil and sediments may be altered by microbial activity; oxidation may lead to the precipitation of manganese. Bacteria and microflora can increase the mobility of manganese.
The transport and partitioning of manganese in water is controlled by the solubility of the specific chemical form present, which in turn is determined by pH, Eh (oxidation-reduction potential), and the characteristics of the available anions. The metal may exist in water in any of four oxidation states.
Manganese(II) predominates in most waters (pH 4-7) but may become oxidized at a pH >8 or 9. The principal anion associated with Mn(II) in water is usually carbonate (CO_3^{2-}), and the concentration of manganese is limited by the relatively low solubility (65 mg/L) of $MnCO_3$. In relatively oxidized water, the solubility of Mn(II) may be controlled by manganese oxide equilibria, with manganese being converted to the Mn(II) or Mn(IV) oxidation states. In extremely reduced water, the fate of manganese tends to be controlled by formation of a poorly soluble sulfide. Manganese in water may undergo oxidation at high pH or Eh and is also subject to microbial activity. For example, Mn(II) in a lake was oxidized during the summer months, but this was inhibited by a microbial poison, indicating that the oxidation was mediated by bacteria . The microbial metabolism of manganese is presumed to be a function of pH, temperature, and other factors.
Manganese in water may be significantly bioconcentrated at lower trophic levels. A bioconcentration factor (BCF) relates the concentration of a chemical in plant and animal tissues to the concentration of the chemical in the water in which they live. The BCF of manganese was estimated as 2,500 - 6,300 for phytoplankton, 300 -5,500 for marine algae, 80 - 830 for intertidal mussels, and 35 - 930 for coastal fish. Similarly, the BCF of manganese was estimated to be 10,00 -20,000 for marine and freshwater plants, 10,000 - 40,000 for invertebrates, and 10 - 600 for fish. In general, these data indicate that lower organisms such as algae have larger BCFs than higher organisms. In order to protect consumers from the risk of manganese bioaccumulation in marine mollusks, the U.S. EPA has set a criterion for manganese at 0.1 mg/L for marine waters.
Elemental manganese and inorganic manganese compounds have negligible vapor pressures but may exist in air as suspended particulate matter derived from industrial emissions or the erosion of soils. Manganese-containing particles are mainly removed from the atmosphere by gravitational settling, with large particles tending to fall out faster than small particles. The half-life of airborne particles is usually on the order of days, depending on the size of the particle and atmospheric conditions. Some removal by washout mechanisms such as rain may also occur, although it is of minor significance in comparison to dry deposition.
Ecotoxicity:
Manganese ion is toxic to aqueous organisms
Fish LC50 (28 d): orfe 2490 mg/l, trout 2.91 mg/l
Daphnia magna LC50: 50 mg/l
Pseudomonas putida LC50: 10.6 mg/l
Photobacterium phosphoreum LC50: 14.7 mg/l
Turbellarian worms (EC0): Polycelis nigra 660 mg/l (interference threshold); microregma 31 mg/l.

SILICA AMORPHOUS:
■ For Amorphous Silica: Amorphous silica is chemically and biologically inert. It is not biodegradable.
Aquatic Fate: Due to its insolubility in water there is a separation at every filtration and sedimentation process. On a global scale, the level of man-made synthetic amorphous silicas (SAS) represents up to 2.4% of the dissolved silica naturally present in the aquatic environment and untreated SAS have a relatively low

continued...

water solubility and an extremely low vapour pressure. Biodegradability in sewage treatment plants or in surface water is not applicable to inorganic substances like SAS.
Terrestrial Fate: Crystalline and/or amorphous silicas are common on the earth in soils and sediments, and in living organisms (e.g. diatoms), but only the dissolved form is bioavailable. On the basis of these properties it is expected that SAS released into the environment will be distributed mainly into soil/sediment. Surface treated silica will be wetted then adsorbed onto soils and sediments.
Atmospheric Fate: SAS is not expected to be distributed into the air if released.
Ecotoxicity: SAS is not toxic to environmental organisms (apart from physical desiccation in insects). SAS presents a low risk for adverse effects to the environment.
For silica:
The literature on the fate of silica in the environment concerns dissolved silica in the aquatic environment, irrespective of its origin (man-made or natural), or structure (crystalline or amorphous). Indeed, once released and dissolved into the environment no distinction can be made between the initial forms of silica. At normal environmental pH, dissolved silica exists exclusively as monosilicic acid [Si(OH)4]. At pH 9.4 the solubility of amorphous silica is about 120 mg SiO2/l . Quartz has a solubility of only 6 mg/l, but its rate of dissolution is so slow at ordinary temperature and pressure that the solubility of amorphous silica represents the upper limit of dissolved silica concentration in natural waters. Moreover, silicic acid is the bioavailable form for aquatic organisms and it plays an important role in the biogeochemical cycle of Si, particularly in the oceans.
In the oceans, the transfer of dissolved silica from the marine hydrosphere to the biosphere initiates the global biological silicon cycle. Marine organisms such as diatoms, silicoflagellates and radiolarians build up their skeletons by taking up silicic acid from seawater. After these organisms die, the biogenic silica accumulated in them partly dissolves. The portion of the biogenic silica that does not dissolve settles and ultimately reaches the sediment. The transformation of opal (amorphous biogenic silica) deposits in sediments through diagenetic processes allows silica to re-enter the geological cycle. Silica is labile between the water and sediment interface.
Ecotoxicity:
Fish LC50 (96 h): Brachydanio rerio >10000 mg/l; zebra fish >10000 mg/l
Daphnia magna EC50 (24 h): >1000 mg/l; LC50 924 h): >10000 mg/l.

CARBON BLACK:

TITANIUM DIOXIDE:

LEAD CHROMATE:
■ Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
Lead is primarily an atmospheric pollutant that enters soil and water as fallout, a process determined by physical form and particle size. Lead in the form of alkyls has been introduced to the environment primarily from leaded petrol. These are converted to water-soluble lead compounds of high toxicity and availability to plants. Such compounds easily leach from soil to contaminate water sources close to highways. Lead that has entered the aquatic system from run-off or as fallout of insoluble precipitates is found in sediments. The biological methylation of inorganic lead by lake sediment micro-organisms has been demonstrated although its significance is not entirely clear. Other forms of soluble or insoluble lead may also enter the environment and undergo bioaccumulation through a series of biological incidents.
For Chromium: Chromium is poorly absorbed by cells found in microorganisms, plants and animals. Hexavalent chromate anions are readily transported into cells and toxicity is closely linked to the higher oxidation state.
Ecotoxicity - Toxicity in Aquatic Organisms: Chromium is harmful to aquatic organisms in very low concentrations. Organisms consumed by fish species are very sensitive to low levels of chromium. Chromium is toxic to fish although less so in warm water. Marked decreases in toxicity are found with increasing pH or water hardness; changes in salinity have little if any effect. Chromium appears to make fish more susceptible to infection. High concentrations can damage and/or accumulate in various fish tissues and in invertebrates such as snails and worms. Reproduction of water fleas is affected by exposure to 0.01 mg/kg hexavalent chromium/L. Toxicity of chromium in fresh-water organisms resulted in mortality rates of 50%. The most sensitive species to the hexavalent chromium anion are invertebrates, scud, fathead minnow, rainbow trout, cladoceran and water flea vertebrate species and guppy.

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Toxicity in Microorganisms: In general, toxicity for most microorganisms occurs in the range of 0.05 -5 mg chromium/kg. Trivalent chromium is less toxic than the hexavalent form. The main signs of toxicity are inhibition of growth and the inhibition of photosynthesis or protein synthesis. Gram-negative soil bacteria are generally more sensitive to hexavalent chromium (1-12 mg/kg) than the gram-positive types. Toxicity to trivalent chromium is not observed at similar levels. Soil microbial transformation processes such as nitrification may be affected by low levels of hexavalent chromium (1 mg/kg). Chromium should not be introduced to municipal sewage treatment facilities.
Toxicity in Plants: Chromium in high concentrations can be toxic for plants. The main feature of chromium intoxication is chlorosis, which is similar to iron deficiency. Chromium affects carbohydrate metabolism and leaf chlorophyll concentration decreases with hexavalent chromium concentration (0.01-1 mg/L). The hexavalent form appears to more toxic than the trivalent species.
Water Standards: Chromium is identified as a hazardous substance in the Federal (U.S.) Water Pollution Control Act and further regulated by Clean Air Water Act Amendments (US). These regulations apply to discharge. The US Primary drinking water Maximum Contaminant Level (MCL), for chromium, is 0.05 mg/L. (total chromium).
For chromium:
Aquatic Fate - Most chromium released into water will be deposited in the sediment. A small percentage of chromium can be found in soluble and insoluble forms with soluble chromium making up a very small percentage of the total chromium. Most of the soluble chromium is present as chromium (VI) and soluble chromium (III) complexes. In the aquatic phase, chromium (III) occurs mostly as suspended solids adsorbed onto clayish materials, organics, or iron oxide present in water. Soluble forms and suspended chromium can undergo intramedia transport. Chromium (VI) in water will eventually be reduced to chromium (III) by organic matter in the water. This process may be slower depending on the type and amount of organic material present and on the redox condition of the water. The reaction was generally faster under anaerobic than aerobic conditions. The oxidation of chromium (III) to chromium (VI) during chlorination of water was highest in the pH range of 5.5 - 6.0.
Atmospheric Fate: Transport of chromium from water to the atmosphere is not likely, except by transport in windblown sea sprays.
Terrestrial Fate: Ecotoxicity - Bioaccumulation is not expected to occur in rainbow trout. Bioaccumulation in bottom feeder bivalves, such as the oyster, blue mussel, and soft shell clam is low. Chromium ranges from slightly toxic to highly toxic in water fleas. Chromium is not expected to biomagnify in the aquatic food chain. Chromium (III) has very low solubility and low mobility in the environment and low toxicity in l organisms. In these forms, chromium is relatively soluble, mobile, and toxic to living organisms. Plants - Bioaccumulation of chromium from soil to above-ground parts of plants is unlikely. There is no indication of biomagnification of chromium along the terrestrial food chain (soil-plant-animal). Chromium concentration in plants may vary with geographic location. Soil - Chromium (VI) may be present in soil as chromate and chromic acid. The fate of chromium in soil is dependent upon the chromium species, which is a function of redox potential and soil pH. Most commonly, soil chromium is in the chromium (III) state. In deeper, anaerobic soils, chromium (VI) will be reduced to chromium (III) by disulfur and ferrous sulfate in soil. The reduction of chromium (VI) to chromium (III) is possible in aerobic soils that contain appropriate organic energy sources. The reduction of chromium (VI) to chromium (III) is facilitated by low pH. Chromium (VI) may exist in the aerobic zone of some natural soil. The oxidation of chromium (III) to chromium (VI) is facilitated by the presence of low oxidisable organic substances, oxygen, manganese dioxide, and moisture. However, when availability of mobile chromium (III) is low, a large portion of chromium in soil will not be oxidized to chromium (VI), even in the presence of magnesium dioxide and favorable pH. Organic forms of chromium (III) are more easily oxidized than insoluble oxides. Factors affecting the microbial reduction of chromium (VI) to chromium (III) include biomass concentration, initial chromium (VI) concentration, temperature, pH, carbon source, oxidation-reduction potential and the presence of both oxyanions and metal cations. Although high levels of chromium (VI) are toxic to most microbes, several resistant bacterial species have been identified which could ultimately be employed in remediation strategies. Most soil chromium is present mainly as insoluble chromium oxide and nH20 and is not very mobile. Chromium was not found in leachate from soil, possibly because it formed complexes with organic matter. The leachability of chromium (VI) increases as soil pH increases. A small percentage of total chromium in soil exists as soluble chromium (VI) and chromium (III), which are more mobile in soil. Sorption depends primarily on the clay content of the soil and, to a lesser extent, on the amount of iron oxide and the organic content. Ecotoxicity: Chromium irreversibly sorb soil will not be bio-available to plants and animals under any condition.
Atmospheric Fate: Chromium in soil may be transported to the atmosphere as an aerosol. The low pH of acid rain may facilitate leaching of acid-soluble chromium (III) and (VI) into soil. In the atmosphere, chromium (VI) may be reduced to chromium (III) at a significant rate if vanadium (V2+, V3+ and VO+), ferrous sulfate,

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bicarbonate ions and arsenic are present. The estimated half life of atmospheric chromium (VI) reduction to chromium (III) has been reported to be from 16 hrs to about 5 days. Aquatic Fate: Surface runoff can transport soluble and bulk precipitates of chromium to surface water. Soluble and unadsorbed chromium (III) and (VI) complexes in soil may leach into groundwater.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
aluminium	No Data Available	No Data Available		
magnesium	No Data Available	No Data Available	LOW	
manganese	No Data Available	No Data Available		
silica amorphous	HIGH	No Data Available	LOW	HIGH
carbon black	No Data Available	No Data Available		
titanium dioxide	HIGH	No Data Available	LOW	HIGH
lead chromate	No Data Available	No Data Available		

Section 13 - DISPOSAL CONSIDERATIONS

■ - Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:
None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE None

REGULATIONS

Regulations for ingredients

aluminium (CAS: 7429-90-5) is found on the following regulatory lists;
"Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (AQUA/1 to 6 - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (Domestic water supply - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (IRRIG - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (STOCK - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Aquatic habitat)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Domestic water supply quality)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (IRRIG)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (STOCK)","Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","WHO

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Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established"

magnesium (CAS: 7439-95-4) is found on the following regulatory lists;

"Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Illicit Drug Precursors/Reagents - Category II","Australia Inventory of Chemical Substances (AICS)"

manganese (CAS: 7439-96-5) is found on the following regulatory lists;

"Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (Domestic water supply - inorganic chemicals)", "Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (IRRIG - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Domestic water supply quality)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (IRRIG)","Australia Inventory of Chemical Substances (AICS)","WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

silica amorphous (CAS: 7631-86-9,112945-52-5,67762-90-7,68611-44-9,68909-20-6,112926-00-8, 61790-53-2,60676-86-0,91053-39-3,69012-64-2) is found on the following regulatory lists;

"Australia Exposure Standards","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines","CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP","GESAMP/EHS Composite List - GESAMP Hazard Profiles", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","International Council of Chemical Associations (ICCA) - High Production Volume List"

MOGUL L (CAS: 1333-86-4) is found on the following regulatory lists;

"Australia Dangerous Goods Code (ADG Code) - Goods Too Dangerous To Be Transported","Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","International Council of Chemical Associations (ICCA) - High Production Volume List"

TITANIUM DIOXIDE KRONOS 2063S (CAS: 13463-67-7,1317-70-0,1317-80-2,12188-41-9,1309-63-3,100292-32-8,101239-53-6,116788-85-3,12000-59-8,12701-76-7,12767-65-6,12789-63-8,1344-29-2,185323-71-1, 185828-91-5,188357-76-8,188357-79-1,195740-11-5,221548-98-7,224963-00-2,246178-32-5,252962-41-7,37230-92-5,37230-94-7,37230-95-8,37230-96-9,39320-58-6,39360-64-0,39379-02-7,416845-43-7, 494848-07-6,494848-23-6,494851-77-3,494851-98-8,55068-84-3,55068-85-4,552316-51-5,62338-64-1, 767341-00-4,97929-50-5,98084-96-9) is found on the following regulatory lists;

"Australia Exposure Standards","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines","Australia Therapeutic Goods Administration (TGA) Sunscreening agents permitted as active ingredients in listed products","CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","International Fragrance Association (IFRA) Survey: Transparency List"

lead chromate (CAS: 7758-97-6) is found on the following regulatory lists;

"Australia Exposure Standards","Australia Hazardous Substances","Australia Inventory of Chemical Substances (AICS)","International Chemical Secretariat (ChemSec) SIN List (*Substitute It Now!)","International Council of Chemical Associations (ICCA) - High Production Volume List"

No data for Metaline Splashbacks (CW: 15-9910)

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
silica amorphous	7631- 86- 9, 112945- 52- 5, 67762- 90- 7, 68611- 44- 9, 68909- 20- 6, 112926- 00- 8, 61790- 53- 2, 60676- 86- 0, 91053- 39- 3, 69012- 64- 2
titanium dioxide	13463- 67- 7, 1317- 70- 0, 1317- 80- 2, 12188- 41- 9, 1309- 63- 3, 100292- 32- 8, 101239- 53- 6, 116788- 85- 3, 12000- 59- 8, 12701- 76- 7, 12767- 65- 6, 12789- 63- 8, 1344- 29- 2, 185323- 71- 1, 185828- 91- 5, 188357- 76- 8, 188357- 79- 1, 195740- 11- 5, 221548- 98- 7, 224963- 00- 2, 246178- 32- 5, 252962- 41- 7, 37230- 92- 5, 37230- 94- 7, 37230- 95- 8, 37230- 96- 9, 39320- 58- 6, 39360- 64- 0, 39379- 02- 7, 416845- 43- 7, 494848- 07- 6, 494848- 23- 6, 494851- 77- 3, 494851- 98- 8, 55068- 84- 3, 55068- 85- 4, 552316- 51- 5, 62338- 64- 1, 767341- 00- 4, 97929- 50- 5, 98084- 96- 9

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

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A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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This is the end of the MSDS.

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