

Cover and frame systems to suit all applications, loadings and sizes

Rhinocast - Ductile Iron Access Covers
Urbanfil - Galvanised Steel Access covers
Hermelock® - Composite Access Covers
Special Application Access Covers

ACO - A World Leader in Access Cover Solutions



ACO is one of the world leaders in the design and manufacture of access covers.

Established in 1946, the ACO Group has manufactured products for the construction industry for over 50 years and operates on a global basis through its subsidiaries and manufacturing facilities. ACO is an acknowledged innovator in products manufactured from ductile iron, polymer concrete and other corrosion resistant materials.

ACO employs more than 3,200 people, has sales in excess of \$A800 million and manufacturing operations in 28 countries.

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Quality

The ACO Group is dedicated to achieving the highest possible standard of quality throughout the organisation. ACO Polycrete Pty Ltd is an ASI registered firm assessed to ISO 9001, the internationally recognised standard for quality.



**Quality
Endorsed
Company**

ISO 9001
QEC : 1883
SAI Global
Assurance
Services

Certified Products

All Rhinocast ductile covers are designed and manufactured in full compliance with the requirements of AS 3996 Metal Access Covers Road Grates and Frames.

Other ACO Access products are independently tested to meet the loading requirements of AS 3996.

Hermelock® and Servokat covers are load tested to EN 124.



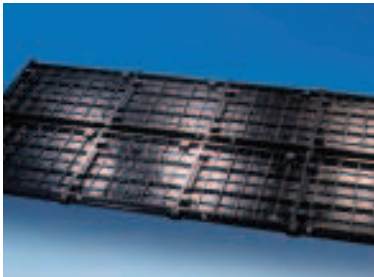
**Australian
Standard**

AS 3996 Lic 2646
Standards Australia

ACO Polycrete manufactures and distributes Australia's most comprehensive range of access covers. Products are available for every application from architectural to heavy duty industrial.

Rhinocast - Ductile Iron

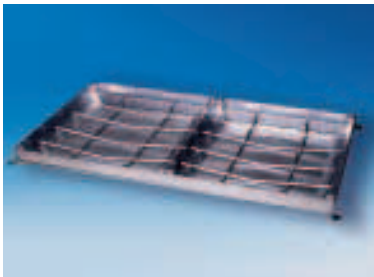
- Circular solid top and recessed
- Square/rectangular recessed
- 2-part, 3-part, multipart and trench run recessed covers



Ductile iron multipart recessed cover

Urbanfil - Galvanised Steel

- Square/rectangular recessed
- 2-part, 3-part, multipart and trench run recessed covers
- Pavermate covers



Galvanised steel 2-part recessed cover

Hermelock® - Composite

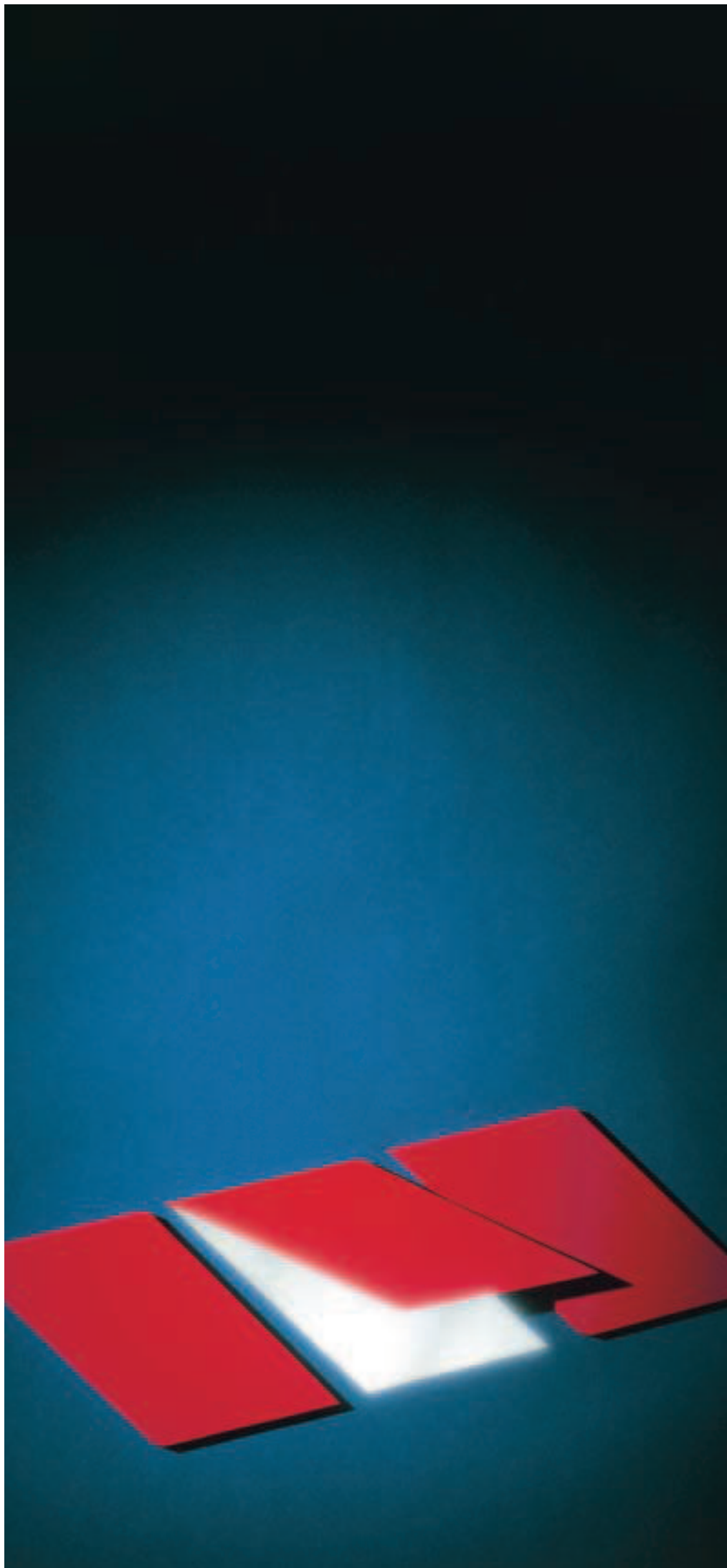
- Circular solid top
- Square solid top



Hermelock® composite single cover

Special Applications

- Servokat - Assisted lift covers
- Fire rated covers



Materials Information

ACO Access covers and frames are manufactured from either cast iron, galvanised steel or composite. A choice of materials is available to provide a range of solutions to various application requirements – such as loading, health and safety, aesthetics, lifting and chemical resistance.



Cast Iron

Grey iron is made when pig iron is melted in small cupola furnaces and poured into moulds to make castings. Containing around 2% - 6% carbon, scrap iron or steel is often added to vary the composition.

Ductile iron is produced by adding magnesium to the molten pig iron; when the iron is cast, the carbon forms tiny spherical graphite nodules around the magnesium.

Engineering Properties:

- 600/3 ductile iron to AS 1831:1985
- Tensile Strength - 600 MPa min.
- 0.2% Proof Stress - 370 MPa min.
- Hardness, 145-185 (HRB)
- Density - 7.15 gm/cc
- Elongation - 3% minimum
- Black bitumen coating to BS 3416 Type 2 (cold applied)



Galvanised Steel

Hot rolled mild steel is low carbon steel, with traces of manganese, silicon and phosphorus. Recessed access covers fabricated from mild steel are typically reinforced with either 8mm merchant rods or 12mm Tempcore-400Y deformed bars.

Engineering Properties:

- 2mm steel frames and covers to AS 1365
- Hot dip galvanised to AS 4680 for maximum corrosion resistance
- Yield Strength: 280MPa
- Tensile Strength: 395MPa
- Elongation on 80mm %: 35%
- Hardness, 55 (HRB)



Composite

Composites usually contain a reinforcing fibre such as fibreglass in a polymer mix.

For high strength applications, aramid and carbon are sometimes used. The polymer matrix is a thermoset resin, with polyester, vinyl ester and epoxy resins most often the matrix of choice.

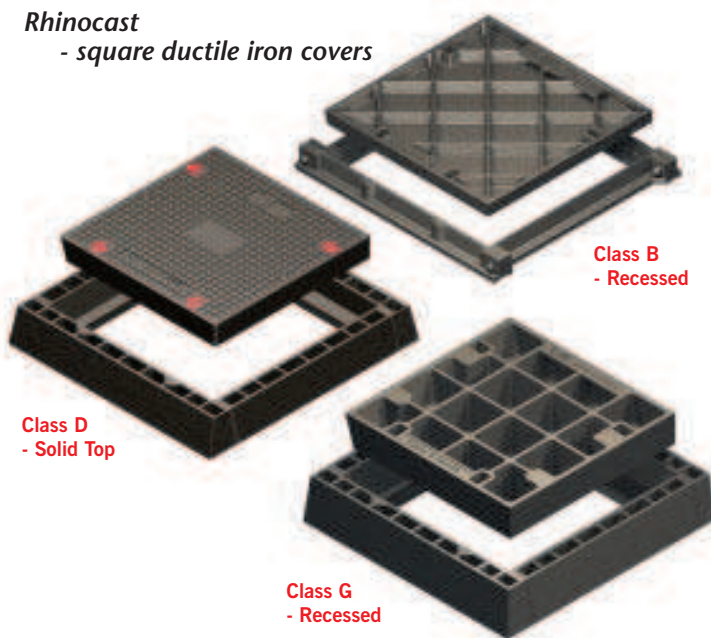
Engineering Properties:

- Recycled composite material with glass fibre reinforcing in the frame
- Density: 1.18 g/cm³
- Tensile strength: 40 MPa
- Bending strength: 65 MPa
- Strain at Break: 24%
- Coefficient of Expansion: 133 x 10⁻⁶ m/m. K
- Impact Strength: 48 kJ/m²
- Shrinkage: 0.89%
- Coefficient of Thermal Conductivity: 0.22 W/K.m
- Offers excellent corrosion and chemical resistance

Product Range

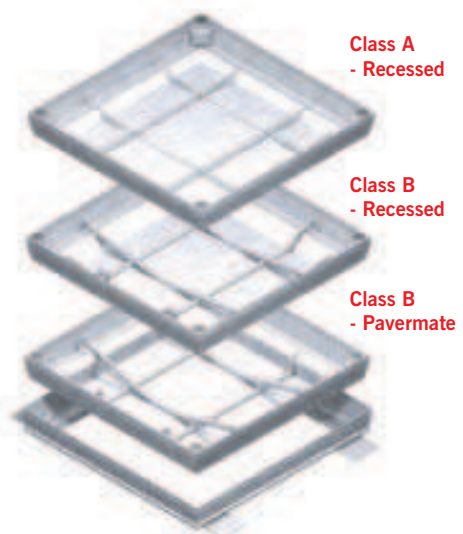
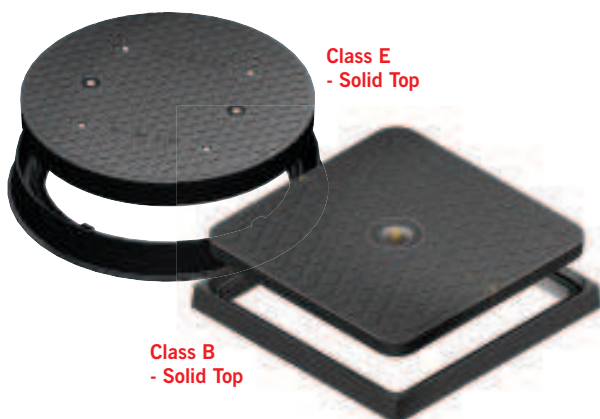
ACO Access covers and frames are manufactured from either galvanised steel or ductile iron. Galvanised steel access covers are typically used for light duty applications and ductile iron covers for light to extra heavy duty applications.

Rhinocast - square ductile iron covers



Rhinocast - circular ductile iron covers

Hermelock® - composite covers



Urbanfil - galvanised steel covers

ACO Access Product Selector

This diagram is provided as a guide to aid selection of the right access cover. It illustrates the various applications where access covers are used and key factors to consider when selecting an access cover.



G900kN 1 4
Docks and aircraft pavements subject to very high wheel loads

- 1 Rhinocast covers
- 2 Urbanfil covers
- 3 Hermelock® covers
- 4 Servokat covers



A10kN
Footways and areas accessible only to pedestrians & pedal cyclists

- 1
- 2
- 3
- 4



B80kN 1 2 3 4
Footways that can be mounted by vehicle or livestock, and light tractor paths

NOTE: The Load Classes shown above are indicative only. It is the customer's responsibility to determine/verify the anticipated design loads for each application. Engineering advice may be necessary.



E400kN 1 3 4
 General docks and aircraft pavements



F600kN 1 4
 Docks and aircraft pavements subject to high wheel loads



B80kN 1 2 3 4
 Footways that can be mounted by vehicle or livestock, and light tractor paths



D210kN 1 3
 Carriageways of roads and areas open to commercial vehicles



B80kN 1 2 3 4
 Footways that can be mounted by vehicle or livestock, and light tractor paths



C150kN 1 3 4
 Malls and pedestrian areas open to slow moving commercial vehicles

Choosing the Right Access Cover

Choosing the right access cover for the given application is essential to prevent problems and product failures in the future. The key factors to consider are listed below and covered in more detail on pages 7-9.

ACO's Technical Services can also offer additional advice and assistance in choosing the right access cover.

<p>1 Load Class</p>		<p>Choose the right cover and frame to withstand the anticipated type and frequency of traffic. ACO's covers are certified to AS 3996 loadings. See details on page 7 for full information.</p>
<p>2 Size</p>		<p>Access cover sizes are quoted in terms of clear opening. ACO offers a range of sizes & formats; Single-parts, 2-part, 3-part, Trench runs and Multi-parts.</p>
<p>3 Aesthetics</p>		<p>Recessed covers allow matching infill. Decorative brass or stainless steel edging can be added to rectangular & square covers.</p>
<p>4 Security</p>		<p>Certain covers are bolted as standard, others can have bolts added as an option. Security Barri bolts are also available.</p>
<p>5 Gas & water tight</p>		<p>All covers are gas and water tight under normal atmospheric pressure. Hold down bolts are available to assist with back pressure applications.</p>
<p>6 Cover orientation</p>		<p>In fast moving traffic, covers should be positioned with the drawcut facing the traffic flow to prevent the cover from accidentally lifting. Covers should be positioned to avoid obstacles that may prevent easy cover removal.</p>
<p>7 Handling</p>		<p>Smaller individual covers can be combined to create the required opening if there are manual handling restrictions. ACO ACCESS also offers a range of composite and assisted lift covers for easier lifting.</p>

1 Load Class



AS 3996 – Clause 1.1 Scope

“This standard specifies requirements for access covers and grates for use in vehicular and pedestrian areas. It applies to access covers & grates having a clear opening of up to 1300mm...”

NATA Certification

As part of ACO’s continuous product development and commitment to quality, ACO has NATA certified testing equipment (Licence no. 15193), operated by fully trained and certified technicians

In practice, there are a number of key factors affecting a cover’s resistance to load:

- i) **Type of traffic** - pedestrians, cars, trucks, forklifts etc. crossing the cover. For trolleys and forklifts particularly, consider the weight of loads being carried.
- ii) **Frequency of traffic** - more frequent traffic may require a heavier load class.
- iii) **Speed of traffic** - fast moving traffic can intensify the load effect on the cover.
- iv) **Position of cover** - if the cover is positioned where traffic will be turning, braking or if the cover is installed at the bottom of a ramp, it will be subjected to extreme forces. Selecting the right cover and frame is essential.
- v) **Wheel type** - solid tyres exert loads through smaller contact areas than pneumatic tyres. A heavier duty cover may be required.

AS 3996 table of load classification

Load Class A 10kN Extra light duty	Load Class B 80kN Light duty	Load Class C 150kN Medium duty	Load Class D 210kN Heavy duty	Load Class E 400kN Extra heavy duty	Load Class F 600kN Extra heavy duty	Load Class G 900kN Extra heavy duty
Typical uses						
Footways and areas accessible only to pedestrians & pedal cyclists	Footways that can be mounted by vehicle or livestock, and light tractor paths	Malls and pedestrian areas open to slow moving commercial vehicles	Carriageways of roads and areas open to commercial vehicles	General docks and aircraft pavements	Docks and aircraft pavements subject to high wheel loads	Docks and aircraft pavements subject to very high wheel loads

Approximate wheel load

330kg 2,670kg 5,000kg 8,000kg 13,700kg 20,000kg 30,000kg

EN 124 table of load classification

CLASS A 15kN	CLASS B 125kN	CLASS C 250kN	CLASS D 400kN	CLASS E 600kN	CLASS F 900kN
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Rhinocast - Ductile Iron Covers

Circular covers - p12

Square/rectangular covers ¹ - p14

Urbanfil - Galvanised Steel Covers

Standard covers - p28

Pavermate cover ¹ - p32

Special sizes made to order
- contact ACO for details

Hermelock® - Composite Covers ²

Circular and square solid top covers - p36

Servokat - Assisted Lift Covers ²

Square/rectangular covers - p40

Notes:

¹ In block paver areas, pavers can decrease the stated loading of the access cover.

² Not certified to AS 3996 but have been tested to stated loads under different loading standards (EN 124). The industry standard is for covers to be tested in the single cover format.

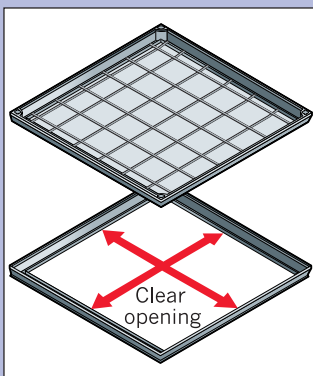
2 Size



Clear opening

The unobstructed opening inside the frame. Dimensions are given as width (W) by length (L).

Ductile iron covers are specified with the width parallel to the lifting ends and undercut. Length is parallel to the direction of cover removal.



Single cover

An access cover where a single cover is used.

Two-part

An access cover where two covers are seated lengthways on a single frame.

Three-part

An access cover where three covers are seated lengthways on a single frame.

Trench Run

An access cover where multiple covers are seated lengthways on a single frame.

Multi-part

An access cover where multiple covers are seated both lengthways and widthways on a single frame. Beams are required to support the covers but are removable to provide full access.

3 Aesthetics



Infill materials

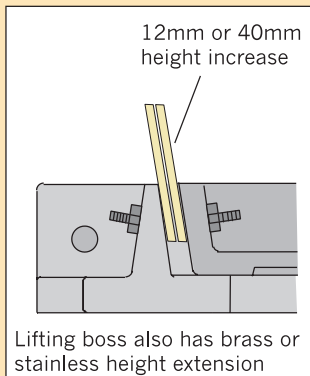
Recessed covers offer the ability to fill the cover with material to match or complement the surrounding pavement.

A maximum tile depth of 25mm and maximum paver depth of 40mm is recommended.

Tiles or pavers must be fully restrained and bonded to the concrete bed to prevent damage to the cover. An epoxy mortar is recommended.

Decorative edging

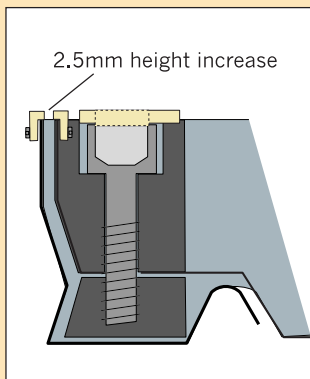
A strip of stainless steel or brass can be fixed to the edge of the cover and frame for an attractive finish



Lifting boss also has brass or stainless height extension

Ductile iron covers

Height increase : 12 or 40mm
Width/Length increase : 6mm



Galvanised steel covers

Height increase : 2.5mm
Width/Length increase : 2.5mm

4 Security



Locking

For additional security or back pressure applications, locking bolts can be added to the cover. Locking bosses are fitted to the cover. The cover and frame is drilled and tapped to accept the locking bolt.

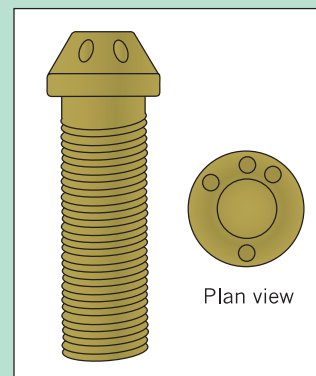
Note: the following covers are locked as standard;

- Ductile iron solid top circular covers
- All Urbanfil galvanised steel covers
- Hermelock® covers (twist action locking)
- Servokat covers

Barri Bolt

A tamper resistant locking bolt for security applications. Special tools are required to remove the bolt.

Barri bolts are not available with Hermelock® covers.



5 Gas and Water seal



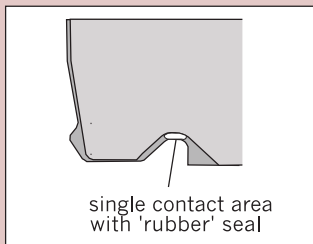
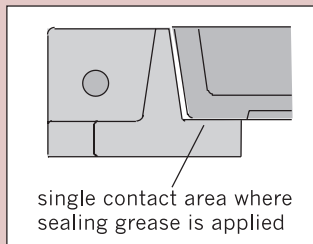
All standard covers are gas and water sealed as standard, to normal atmospheric pressure (up to 1kPa). This type of seal also offers a seal against odours.

Pressure tight

For applications where back pressure is over 1kPa the addition of locking bolts prevents the ingress of gas or water.

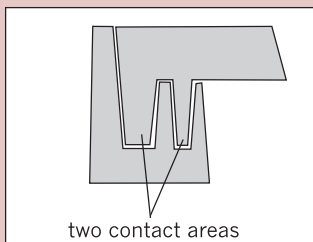
Single Seal

There is one point of contact between the frame and cover where the seal is achieved. The seal can be achieved with grease (RhinoCast) or a 'rubber' gasket (Urbanfil & Servokat).



Double Seal

Two points of contact between the frame and cover where the seal is achieved. Refer to Hermelock® covers, page 36.

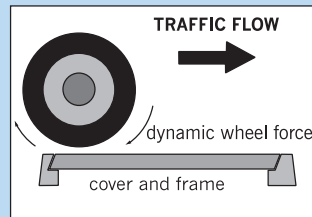


6 Traffic Flow



Traffic Flow

For RhinoCast covers, the drawcut edge should face the orientation traffic flow to prevent cover lifting.

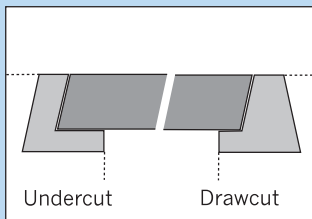


Drawcut

Top of cover is set back from bottom.

Undercut

Top of cover overhangs the bottom.



7 Handling



Work Cover Lifting Guidelines

Work Cover National Code of Practice for Manual Handling recommends a maximum unassisted lifting weight of 55kg. Weights above this require the use of mechanical lifters. All Hermelock® composite covers comply with this code.

Note: Certain states/companies may have different maximum lifting requirements.

Assisted lift

A gas strut is fitted to the frame and cover to enable the cover to be easily lifted.

Refer to Servokat covers (pg 40).

Lifting Keys

Ductile iron and galvanised steel covers can be lifted using standard Australian lifting keys. A selection of short handle, long handle and mechanical lifters are available - see pg 43/44 for details.

Other Commonly Used Terms

Anti-slip surface

A textured finish on solid top covers to reduce the risk of slipping.

Concrete ties

Profile that holds the frame into the concrete bed and prevents the frame being lifted out of its surround.

Keyhole cap

A cover above the keyhole to prevent dirt and debris ingress.

Lead seal

Lead is used to seal the joint between cast iron frames. Lead provides a flexible seal that does not deteriorate in extreme temperatures.

Lifting boss

The recess where the lifting key is inserted and turned to enable the cover to be lifted. ACO's ductile iron and galvanised steel covers use standard lifting keys to AS 3996.

Recessed cover

A cover that requires a concrete infill material added on site. Also allows infill paving materials to complement or match surrounding area.

Reo-bar

Steel bars used for reinforcing galvanised steel covers.

Seating

The frame has an angle at the bottom upon which the cover sits and seals.