

Blu**Seal** AKS ANCHOR KNOB SHEET

Blu**Seal** AKS is an HDPE sheet with extruded integral anchors which are cast into concrete to form a flexible and durable corrosion protection lining.

Concrete wastewater assets have traditionally been lined with epoxies and wet applied coatings. Whilst chemically resistant, spray applied coatings rarely achieve target design service life due to failures caused by substandard surface preparation, non-compatibility with damp substrates or an inability to release negative pressure.

Bluey Technologies provides a corrosion protection liner, BluSeal AKS, that offers a 50 - 100 year design life.



ADVANTAGES AND APPLICATIONS

ADVANTAGES OF USING BLUSEAL AKS

- 50 100 year design life
- Low whole of life cost
- Low maintenance
- High anchor pull out resistance

- Broad chemical resistance
- Highly puncture and abrasion resistant
- Bridges live cracks
- Homogenous lining system



WHERE TO USE BLUSEAL AKS

BluSeal AKS is used to protect concrete surfaces in chemically aggressive environments. It comes in a range of colours and thicknesses and can be applied to new and existing structures for protection or enhancement.

Common applications include:

- Sewerage tunnels
- Treatment plants
- Pump stations

- Manholes
- Piles and foundations
- Chemical retention bunds

PRODUCT INFORMATION

QUALITY MANUFACTURING

- Pinhole free and defect free, as all sheets are manufactured at the Anchor Lining Systems factory in South Africa, under an ISO9001 certified quality system
- Offsite manufacturing also ensures a set thickness, thus eliminating the need for thickness controls on site
- Up to 100 year design life in non-UV environments

LOW WHOLE OF LIFE COST AND MAINTENANCE

- Cast into structural concrete
- Forms fully homogeonous lining system
- Endures ground water inflow and crack bridging (700% elongation at break)
- All welds are 100% tested
- Highly chemical resistant and meets extreme exposure classification requirements
- Damage is uncommon but easily repaired using extrusion welded HDPE patches

FASTER CONSTRUCTION

- Once cast into concrete, the formwork can be stripped, and the seams welded. Upon completion, the asset can go into service.
- No 28-day concrete curing before coating (Often required for spray and epoxy coatings)
- Can significantly decrease project construction times
- Slip forming times can be reduced through the application of BluCem HS200







PRODUCT INFORMATION

HIGH ANCHOR ENGAGEMENT

- 1240 anchors per square metre
- Provides up to 700KPa pullout resistance
- The membrane also has 13% elasticity
- Endures ground water inflow
- Crack bridging (700% elongation at break)

HIGHLY PUNCTURE AND ABRASION RESISTANT

- HDPE protects the concrete from abrasion and sharp debris
- Sheets range from 2mm to 10mm in thickness
- Membrane thickness, density and elongation all tested to ASTM standards
- Often used for slurry transfer in pipelines and mining operations.

BRIDGES LIVE CRACKS

- Only the anchors clutch the concrete.
 The flat surface between anchors will not bond to concrete
- This allows the anchored membrane to release negative pressure and endure ground water inflow and crack bridging
- 700% elongation at break
- Allows vapour transmission.

HOMOGENOUS LINING SYSTEM

- Most welding complete using computer controlled extrusion welder
- Weld temperatures at +200°C
- All welds tested either using a vacuum box or spark test



Blu**Seal** AKS QUALITY

We understand that trust is built on quality outcomes.

That's why BluSeal AKS undergoes extensive testing, prior to and after the manufacturing process. The testing, which meets strict International Standards provides our partners with the confidence of reliable and consistent results.

- Factory manufacturing to ISO 9001
- Water Services Association of Australia (WSAA) recognised system
- Australian Water Authorities product approval E.g Sydney Water, Melbourne Water.
- Potable Water Certification to AS/NZ4020, 2018.
- Almost two decades of successful projects in Australia
- Reliable and repeatable results.







INSTALLATION METHODS

Industry acknowledges the ongoing need to replace and repair assets subjected to chemical and biogenic corrosion.

Stakeholders are seeking long term solutions to extend asset life and reduce whole of life costs.

Our extensive experience and technical knowledge allows us to assist with product selection, detailed design and installation of engineered solutions.

PRECAST CONCRETE

- Cast in lining for precast manufacturing
- Lining can be prefabricated off site for on site casting works

CAST INSITU TO NEW STRUCTURES

- Cast in situ for rehabilitation works
- Lining can be prefabricated off site for on site casting works
- Non-slip sheeting for traffic able areas

RETROFITTING TO EXISTING STRUCTURES

- No 28-day concrete curing period for retrofitting
- Minimal surface preparation required
- Highly tolerant of moisture and therefore does not inhibit installation
- Rapid installation using fast setting grout technology
- Non-slip sheeting for traffic able areas







Blu**Seal** AKS MANUFACTURING

We believe that it's always better to do something right the first time.

BluSeal AKS is manufactured in South Africa from the highest quality HDPE, under ISO9001 manufacturing conditions.

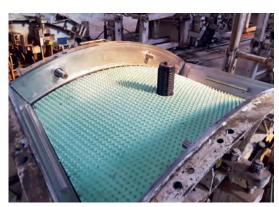
BLUSEAL AKS PERFORMANCE TESTING

- ISO9001 QA System
- Highest quality HDPE polymers
- Anchors cast at time of manufacture ->1,200 anchors per/m²
- Abrasion resistance testing Technische Hoschule Darmstadt
- Hydraulic Load Test negative pressure tested to 5 bar
- Pull Out Test pull out resistance tested to failure at 77,800kg/m²
- Service Design Life anti oxidant depletion testing depletion life ~200 years
- Ultra Violet Stabilisation up to 20 years.

Manufacturing to these standards allows us to offer a consistent, quality product to partners in Australia, New Zealand and South East Asia.







DESIGN AND PLANNING

Prior preparation prevents poor performance.

The most important aspect of any BluSeal AKS project is to ensure the design, planning and preparation is properly executed. Bluey employs Civil and Wastewater Engineers to assist in all design and planning needs for each project.

- Complying to International Code DVS2227 for the welding of semi-finished products made of HDPE
- Sheet layout plans for each structure
- Manufacturer Installation manuals
- Only approved applicators install the BluSeal AKS
- Formal training of technicians through the Bluey/Partec accreditation
- On site and workshop technical support available







APPLICATIONS

MANHOLES

The greatest corrosive attack in manholes occurs due to an aggressive bacterium; Thiobacillus Concretivourus. These bacteria use sulphur as a primary energy source which breaks down concrete and epoxies over time.

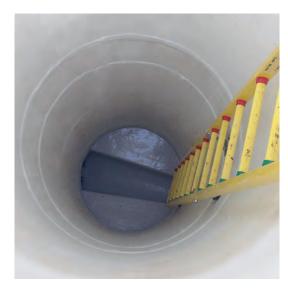
What has made BluSeal AKS successful over the past 15 years is its impressive durability and resistance to chemically aggressive environments. BluSeal AKS' highest quality HDPE resins makes the membrane more chemically resistant, meaning a 100 years design life in manholes.

PUMP STATIONS/WASTEWATER TREATMENT PLANTS

Despite being a plastic, which people consider to be typically soft, BluSeal AKS performs better than concrete in abrasion tests. This makes is an ideal material at pump stations and treatment facilities.

Infrastructure such as this are prone to incredibly harsh environments for concrete, both in relation to treatment chemicals and what is flushed down the pipelines.

- Often installed to the formwork prior to being lifted into place
- This process ensures a high-quality installation
- Saving both time and money.
- Exceeds highest chemical resistance levels





APPLICATIONS

POTABLE WATER

The infrastructure carrying clean, potable water must always be well maintained, to ensure that it's safe for the public to use.

BluSeal AKS can be installed to new of exisiting potable water networks and is frequently specified as a long term solution for potable water networks.

- Australian Standards approved
- Trusted by water authorities, such as Sydney Water

CHEMICAL RETENTION BUNDS

Bund walls act as barriers around storage tanks where dangerous substances are handled, processed or stored. Their purpose being to capture unintended spillage material in case the storage area is damaged.

The corrosion protection liner provides a cast in-situ barrier of HDPE, allowing the safe short-term storage of even the most harmful, and aggressive chemicals.

- Easy applications to tight corners and formwork
- High chemical resistance
- 2mm I0mm thickness
- Post application or cast in-situ.







COMPLIMENTARY PRODUCTS AND VARIATIONS

PRODUCTS

- Weld rod available in colours to match BluSeal AKS sheet
- Fleece-back BluSeal AKS sheets available for connection to non-HDPE surfaces
- BluSeal AKS anti-slip surface texture for specialised floor applications
- BluSeal AKS provided in various colours useful in identification of zones, etc and sheet sizes (to suit panel layouts or installation specific requirements)
- BluSeal AKS varied packaging for project specific handling requirements (ie. rolls sheet wrapped or sheets on pallet, etc.)





Blu**Seal** AKS PRODUCT DATA

BLUSEAL AKS – PRODUCT TEST DATA

TESTED CHARACTERISTIC	STANDARD	RESULT			
Density	ASTM D 505/D 792	≥940kg/m³			
Carbon Black Content**	ASTM D 1603	2.0 - 3.0%			
Carbon Black Dispersion**	ASTM D 5596	Category or Category 2			
ESCR (NCTL)	ASTM D 5397	>300 hours			
OIT	D 3895	>100 minutes			
Coefficient of Linear Expansion	ASTM E 831	1.1 - 1.4E-4cm/cm/°C			
Tensile Properties (Sheet Material)	ASTM D 6693-04	Yield Stress I5MPa	Break Stress 27MPa	Yield Elongation I2%	Break Elongation 700%
Shore Hardness	DIN 53505	>50 Shore D			
Tear Resistance	ASTM D 1004	I20N/mm			
Puncture Resistance	ASTM D 4833	300N/mm			
Dimensional Stability	ASTM D 1204	<2.0% change			
Water Absorption	ASTM D 570	<0.09%			
Flammability	UL94***	VO			

^{*} Average minimum thickness to ASTM D 5199. Minimum thickness membrane made to order

■ 14 Blu**Seal** AKS

^{**} Black AKS only

^{***} Plastics flammability standard released by Underwriters Laboratories of the USA



We deliver...

- Products developed for civil engineering
- Product technical knowledge
- Site application knowhow
- A collaborative approach
- Economical solutions for large projects

HEAD OFFICE QLD

1300 0 BLUEY | qld@bluey.com.au

bluey.com.au

NSW	VIC	SA	WA
nsw@bluey.com.au	vic@bluey.com.au	sa@bluey.com.au	wa@bluey.com.au

TAS	ACT	NT	NZ
tas@bluey.com.au	act@bluey.com.au	nt@bluey.com.au	nz@bluey.com.au

UK/EUROPE ASIA PACIFIC bluey@bluey.ie sales_sg@quicseal.com

Exclusive Distributors for









