MARINE

ROCK BAG
FILTER UNITS

COASTAL | PORTS | HARBOURS | RIVERS

INFRASTRUCTURE

ROCK BAG
FILTER UNITS

ROAD | RAIL | BRIDGES | PORTS

ENVIRONMENTAL

ROCK BAG
FILTER UNITS

LANSCAPES | WATERWAYS | MANGROVES | REVETMENTS

ROCK BAG FILTER UNITS

COASTAL | PORTS | HARBOURS | RIVERS

What are Rock Bag Filter Units?

Rock Bag Filter Units are a relatively new technology however over the last decade, Rock Bag Filter Units have become increasingly utilised in erosion control and other civil applications.

What materials are Rock Bag Filter Units made from?

Currently there are two prominent materials used for the manufacture of Rock Bag Filter Units; these are Polyester (PET) and High Density Polyethylene (HDPE), Though PET can be made from recycled materials, Project Material only use virgin feed materials to ensure purity of the finished product.

How are Rock Bag Filter Units made?

The Rock Bag Filter Unit manufacturing process utilises "Warp" knits exclusively manufactured on a Chain Loom, with each warp controlled by a separate needle. "Raschel Warp Knits" produce run-resistant, closer, flatter, and less elastic knits. Project Material are Joint Venture partners with the manufacturer, ensuring complete chain of custody and Quality Management Systems

What tests do Rock Bag Filter Units go through?

Rock Bag Filter Units as with all Geosynthetics used in the built environment are subject to a series of internationally recognised tests. The following page provides general construction detail and independent test results.

CE Declaration of Performance (DoP)

In accordance with Regulation (EU) No 305/2011 (Construction Products Regulation), this Declaration of Performance is issued under the sole responsibility of the manufacturer identified below.

1. Manufacturer of Record: Project Material Pty Ltd, Unit 12/18 Hinkler Court, Brendale, Queensland 4500, Australia

2. Unique Identification of Product: Product: Rock Bag Filter Unit (RBFU), Models /Types: 1T, 2T, 4T, 6T, 8T, 10T, 12T

3. Intended Use: For use in erosion control, coastal defence, river training, and scour protection works.

4. Assessment and Verification of Constancy of Performance (AVCP) System 4

5. Harmonised Standard Applied: EN ISO 10319:2024

6. Declared Performance: Performance values are based on independent laboratory testing. The following characteristics are declared in accordance with the referenced standards:

7. Reference to Test Documentation

Test Report Reference: CE-RH25082001-SO-CPR

Verification Number: TD52952501

Verification Issue Date: 21/08/2025 — Verification Expiry Date: 20/08/2030

8. Presumed durability :

PET: Minimum 50 years in soil and submerged conditions at temperatures < 25°C.

PET: Minimum 25 years in exposed or bio engineered conditions at temperatures < 25°C.

Signed on behalf of Project Material Pty Ltd:

Name: Stephen Leslie Carney
Function: Product Manager
Date: 09/09/20258

PROJECT MATERIAL PTY LTD
THE COMMON SEAL OF
ABN 93 639 926 195 ACN 639 926 195

Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	56.9
Cross Machine Direction	12.6
Maximum Elongation,(%)	
Machine Direction	34.7
Cross Machine Direction	48.4
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	469
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	2.77
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	56.9
Cross Machine Direction	12.7
After UV Exposure	
Machine Direction	47.8
Cross Machine Direction	11.4
Strength retained,(%)	
Machine Direction	84.1
Cross Machine Direction	91
Elongation (%) Before UV Exposure .	
Machine Direction	34.7
Cross Machine Direction	48.4
After UV Exposure	
Machine Direction	38.1
Cross Machine Direction	44.3
Elongation retained,(%)	
Machine Direction	100
Cross Machine Direction	91.5
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	50
Cross Machine Direction	11.8
Strength retained,(%)	
Machine Direction	88
Cross Machine Direction	93.3
Elongation (%)	
Machine Direction	38.1
Cross Machine Direction	44.4
Elongation retained,(%)	
Machine Direction	100
Cross Machine Direction	91.7

CE 1 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Specifications at Factor of Safety (FoS) 3.5:1

Netting: 2 layers

Arc Length: 2.075 m

Vertical Ropes: 4 × 6 mm

Lifting Loops: 4 loops, 10 mm rope

Netting WLL ≈ 13.76 tonnes

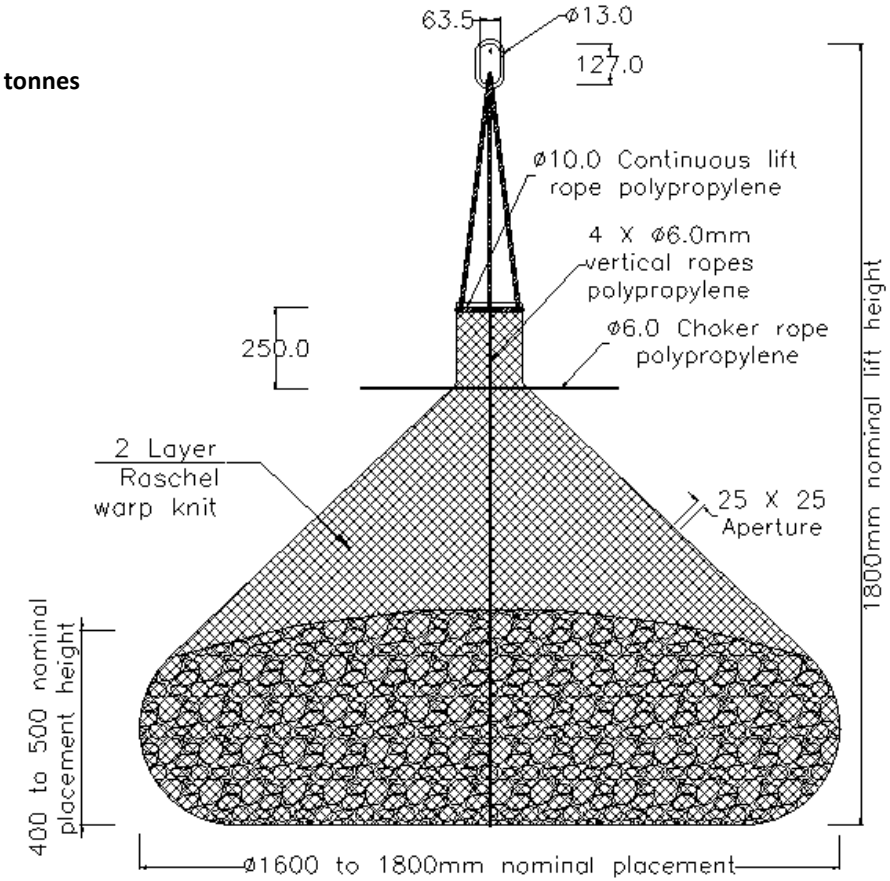
Vertical Rope WLL = 8.57 kN

Bag Assembly WLL = 143.51 kN ≈ 14.63 tonnes

Lifting System

Total Rope Legs = 8

Lifting System WLL ≈ 4.20 tonnes



Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	27.9
Cross Machine Direction	18.8
Maximum Elongation,(%)	
Machine Direction	37.6
Cross Machine Direction	44.7
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	276.1
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	2.57
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	27.9
Cross Machine Direction	18.8
After UV Exposure	
Machine Direction	24.6
Cross Machine Direction	16.2
Strength retained,(%)	
Machine Direction	88.4
Cross Machine Direction	86.1
Elongation (%) Before UV Exposure .	
Machine Direction	37.6
Cross Machine Direction	44.7
After UV Exposure	
Machine Direction	43.2
Cross Machine Direction	40.4
Elongation retained,(%)	
Machine Direction	100
Cross Machine Direction	90.3
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	24.2
Cross Machine Direction	17
Strength retained,(%)	
Machine Direction	86.9
Cross Machine Direction	90
Elongation (%)	
Machine Direction	41.8
Cross Machine Direction	44.8
Elongation retained,(%)	
Machine Direction	100
Cross Machine Direction	100

CE 2 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Specifications at Factor of Safety (FoS) 3.5:1

Netting: 2 layers

Arc Length: 2.319 m

Vertical Ropes: 4 × 6 mm

Lifting Loops: 4 loops, 10 mm rope

Netting WLL ≈ 15.38 tonnes

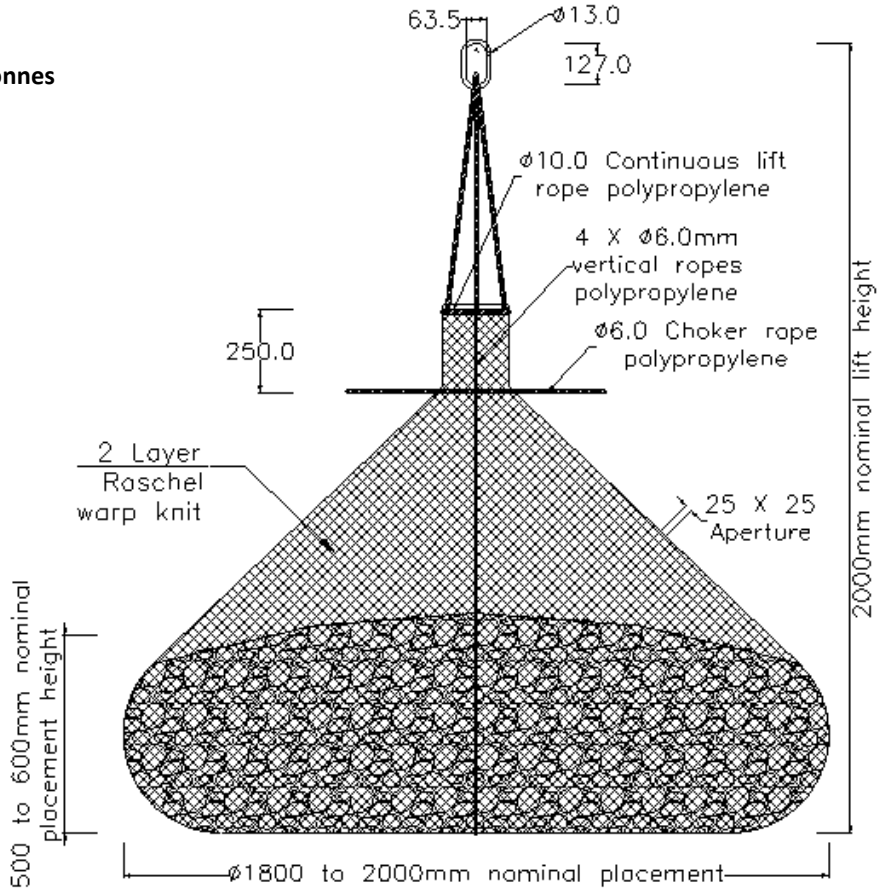
Vertical Rope WLL = 8.57 kN

Bag Assembly WLL = 159.37 kN ≈ 16.25 tonnes

Lifting System

Total Rope Legs = 8

Lifting System WLL ≈ 4.20 tonnes



Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	44.2
Cross Machine Direction	17.5
Maximum Elongation,(%)	
Machine Direction	49.4
Cross Machine Direction	72.5
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	482.7
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	3.31
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	44.2
Cross Machine Direction	17.5
After UV Exposure	
Machine Direction	38.4
Cross Machine Direction	16.7
Strength retained,(%)	
Machine Direction	86.8
Cross Machine Direction	95.9
Elongation (%) Before UV Exposure .	
Machine Direction	49.9
Cross Machine Direction	72.5
After UV Exposure	
Machine Direction	36.2
Cross Machine Direction	41.2
Elongation retained,(%)	
Machine Direction	73.2
Cross Machine Direction	56.8
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	39.7
Cross Machine Direction	16.7
Strength retained,(%)	
Machine Direction	89.9
Cross Machine Direction	95.9
Elongation (%)	
Machine Direction	36.5
Cross Machine Direction	41.2
Elongation retained,(%)	
Machine Direction	73.8
Cross Machine Direction	56.8

CE 4 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Note 4 Ton and 6 Ton are constructed from same material therefore have the same test results

Specifications at Factor of Safety (FoS) 3.5:1

Netting: 2 layers

Arc Length: 2.991 m

Vertical Ropes: 4 × 6 mm

Lifting Loops: 4 loops, 12 mm rope

Netting WLL ≈ 19.83 tonnes

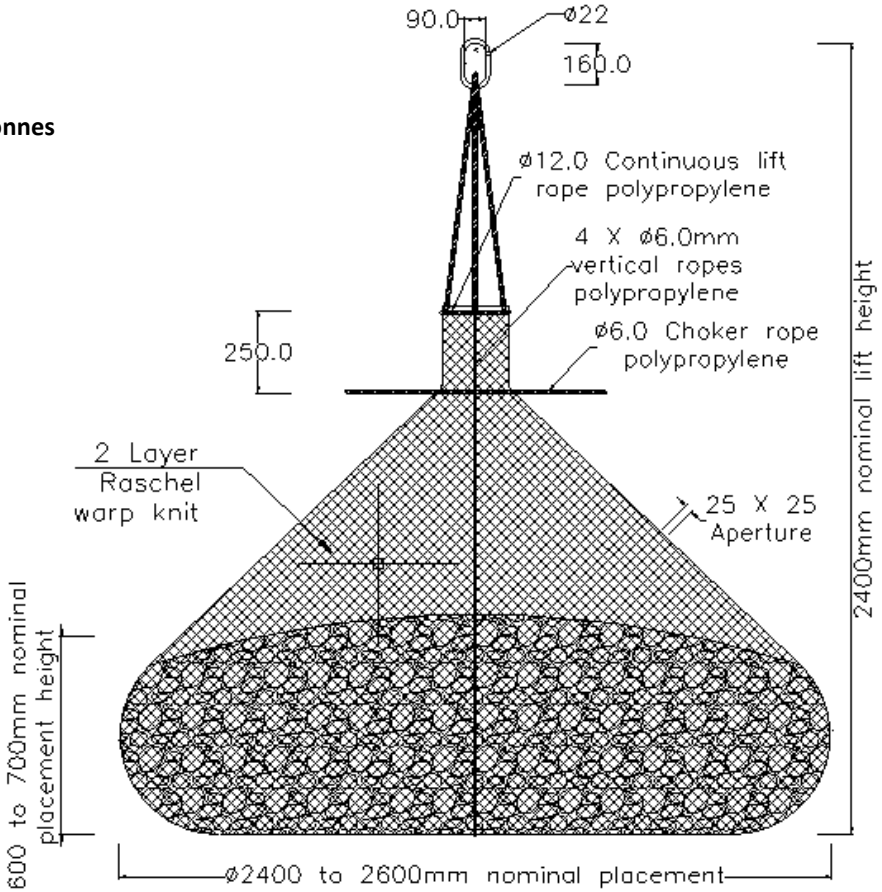
Vertical Rope WLL = 8.57 kN

Bag Assembly WLL = 203.07 kN ≈ 20.71 tonnes

Lifting System

Total Rope Legs = 8

Lifting System WLL ≈ 4.64 tonnes



Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	44.2
Cross Machine Direction	17.5
Maximum Elongation,(%)	
Machine Direction	49.4
Cross Machine Direction	72.5
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	482.7
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	3.31
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	44.2
Cross Machine Direction	17.5
After UV Exposure	
Machine Direction	38.4
Cross Machine Direction	16.7
Strength retained,(%)	
Machine Direction	86.8
Cross Machine Direction	95.9
Elongation (%) Before UV Exposure .	
Machine Direction	49.9
Cross Machine Direction	72.5
After UV Exposure	
Machine Direction	36.2
Cross Machine Direction	41.2
Elongation retained,(%)	
Machine Direction	73.2
Cross Machine Direction	56.8
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	39.7
Cross Machine Direction	16.7
Strength retained,(%)	
Machine Direction	89.9
Cross Machine Direction	95.9
Elongation (%)	
Machine Direction	36.5
Cross Machine Direction	41.2
Elongation retained,(%)	
Machine Direction	73.8
Cross Machine Direction	56.8

CE 6 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Note 4 Ton and 6 Ton are constructed from same material therefore have the same test results

Specifications at Factor of Safety (FoS) 3.5:1

Netting: 4 layers

Arc Length: 3.267 m

Vertical Ropes: 6 × 6 mm

Lifting Loops: 6 loops, 12 mm rope

Netting WLL ≈ 43.33 tonnes

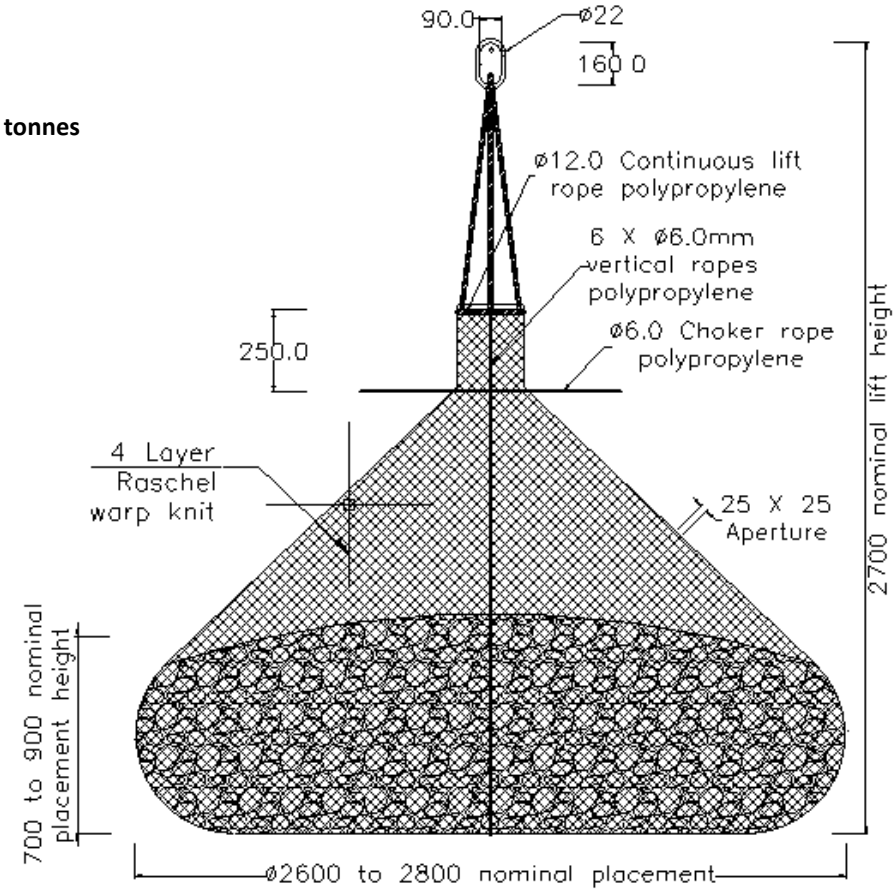
Vertical Rope WLL = 12.86 kN

Bag Assembly WLL = 437.75 kN ≈ 44.64 tonnes

Lifting System

Total Rope Legs = 12

Lifting System WLL ≈ 6.96 tonnes



Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	33.8
Cross Machine Direction	34.1
Maximum Elongation,(%)	
Machine Direction	47.6
Cross Machine Direction	48
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	406.7
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	3.6
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	33.8
Cross Machine Direction	34.1
Machine Direction	29.3
Cross Machine Direction	31.1
Strength retained,(%)	
Machine Direction	88.1
Cross Machine Direction	91.4
Elongation (%) Before UV Exposure .	
Machine Direction	47.6
Cross Machine Direction	48
After UV Exposure	
Machine Direction	37
Cross Machine Direction	33.8
Elongation retained,(%)	
Machine Direction	77.7
Cross Machine Direction	70.4
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	30.5
Cross Machine Direction	31.1
Strength retained,(%)	
Machine Direction	90.3
Cross Machine Direction	91.2
Elongation (%)	
Machine Direction	35.4
Cross Machine Direction	33.8
Elongation retained,(%)	
Machine Direction	74.3
Cross Machine Direction	70.4

CE 8 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Note 8, 10, and 12 Ton RBFU's are constructed from same material therefore have the same test results

Specifications at Factor of Safety (FoS) 3.5:1

Netting: 4 layers

Arc Length: 3.936 m

Vertical Ropes: 6 × 10 mm

Lifting Loops: 6 loops, 16 mm rope

Netting WLL ≈ 52.20 tonnes

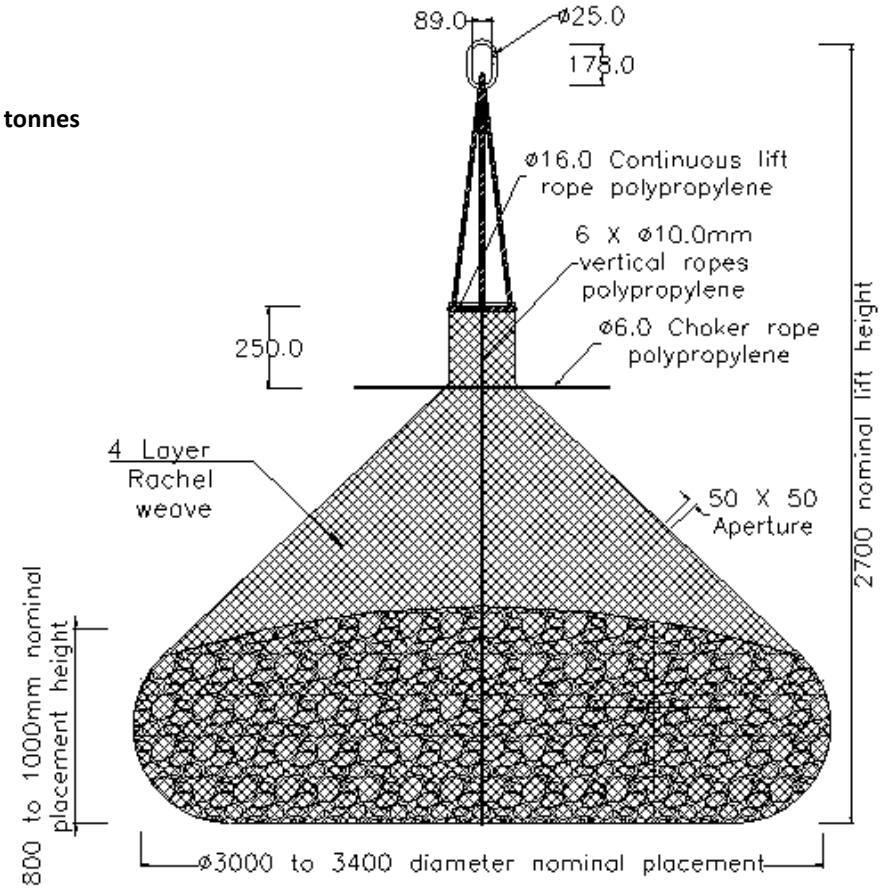
Vertical Rope WLL = 30.91 kN

Bag Assembly WLL = 542.81 kN ≈ 55.35 tonnes

Lifting System

Total Rope Legs = 12

Lifting System WLL ≈ 15.26 tonnes



Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	33.8
Cross Machine Direction	34.1
Maximum Elongation,(%)	
Machine Direction	47.6
Cross Machine Direction	48
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	406.7
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	3.6
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	33.8
Cross Machine Direction	34.1
Machine Direction	29.3
Cross Machine Direction	31.1
Strength retained,(%)	
Machine Direction	88.1
Cross Machine Direction	91.4
Elongation (%) Before UV Exposure .	
Machine Direction	47.6
Cross Machine Direction	48
After UV Exposure	
Machine Direction	37
Cross Machine Direction	33.8
Elongation retained,(%)	
Machine Direction	77.7
Cross Machine Direction	70.4
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	30.5
Cross Machine Direction	31.1
Strength retained,(%)	
Machine Direction	90.3
Cross Machine Direction	91.2
Elongation (%)	
Machine Direction	35.4
Cross Machine Direction	33.8
Elongation retained,(%)	
Machine Direction	74.3
Cross Machine Direction	70.4

CE 10 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Note 8, 10, and 12 Ton RBFU's are constructed from same material therefore have the same test results

Specifications at Factor of Safety (FoS) 3.5:1

Netting: 4 layers

Arc Length: 4.181 m

Vertical Ropes: 8 × 10 mm

Lifting Loops: 6 loops, 16 mm rope

Netting WLL ≈ 55.45 tonnes

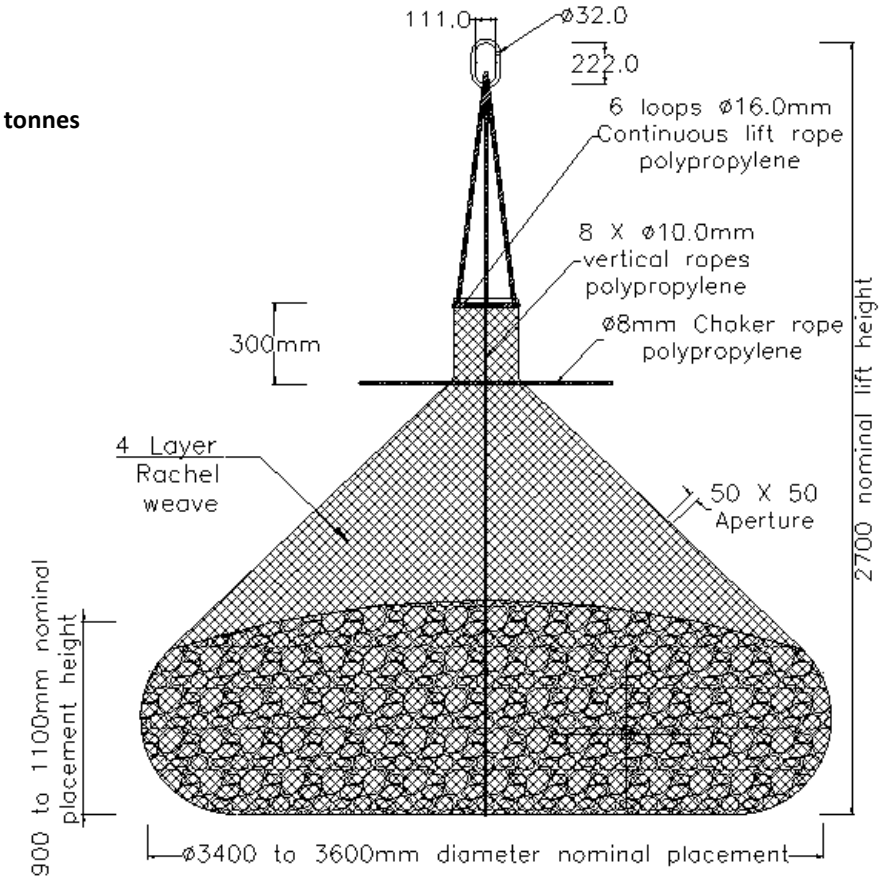
Vertical Rope WLL = 41.21 kN

Bag Assembly WLL = 584.98 kN ≈ 59.65 tonnes

Lifting System

Total Rope Legs = 12

Lifting System WLL ≈ 15.26 tonnes



Test Parameter Wide Width Tensile Strength and Elongation (ISO :10319-2015) Tensile Strength (kN/m)	Result
Machine Direction	33.8
Cross Machine Direction	34.1
Maximum Elongation,(%)	
Machine Direction	47.6
Cross Machine Direction	48
Mass per square meter (ISO: 9864-2005)	
Mass per square meter (g/m^2)	406.7
Thickness (EN ISO 9863-2016)	
Thickness @ 2kpa (mm)	3.6
UV Resistance by Xenon arc lamp for 500 hours (EN-12224:2001) Tensile Strength (kN/m)	
Before UV Exposure	
Machine Direction	33.8
Cross Machine Direction	34.1
Machine Direction	29.3
Cross Machine Direction	31.1
Strength retained,(%)	
Machine Direction	88.1
Cross Machine Direction	91.4
Elongation (%) Before UV Exposure .	
Machine Direction	47.6
Cross Machine Direction	48
After UV Exposure	
Machine Direction	37
Cross Machine Direction	33.8
Elongation retained,(%)	
Machine Direction	77.7
Cross Machine Direction	70.4
Resistance to Hydrolysis (EN 12447 : 2021) Tensile strength after hydrolysis, (kN/m)	
Machine Direction	30.5
Cross Machine Direction	31.1
Strength retained,(%)	
Machine Direction	90.3
Cross Machine Direction	91.2
Elongation (%)	
Machine Direction	35.4
Cross Machine Direction	33.8
Elongation retained,(%)	
Machine Direction	74.3
Cross Machine Direction	70.4

CE 12 Ton PET Rock Bag Filter Unit

RBFU construction incorporates multiple netting layers, vertical ropes and lifting ropes with or without a lift ring. This configuration ensures robust performance under standard and offshore lifting conditions. Our netting and ropes are inhouse manufactured maintaining full chain of custody and quality assurance Both our Rock Bag Filter Units and Certified lift rings are batch tested at each run.

Note 8, 10, and 12 Ton RBFU's are constructed from same material therefore have the same test results

Specifications at Factor of Safety (FoS) 4.0:1

Netting: 6 layers

Arc Length: 4.287 m

Vertical Ropes: 8 × 12 mm

Lifting Loops: 6 loops, 24 mm rope

Netting WLL ≈ 74.62 tonnes

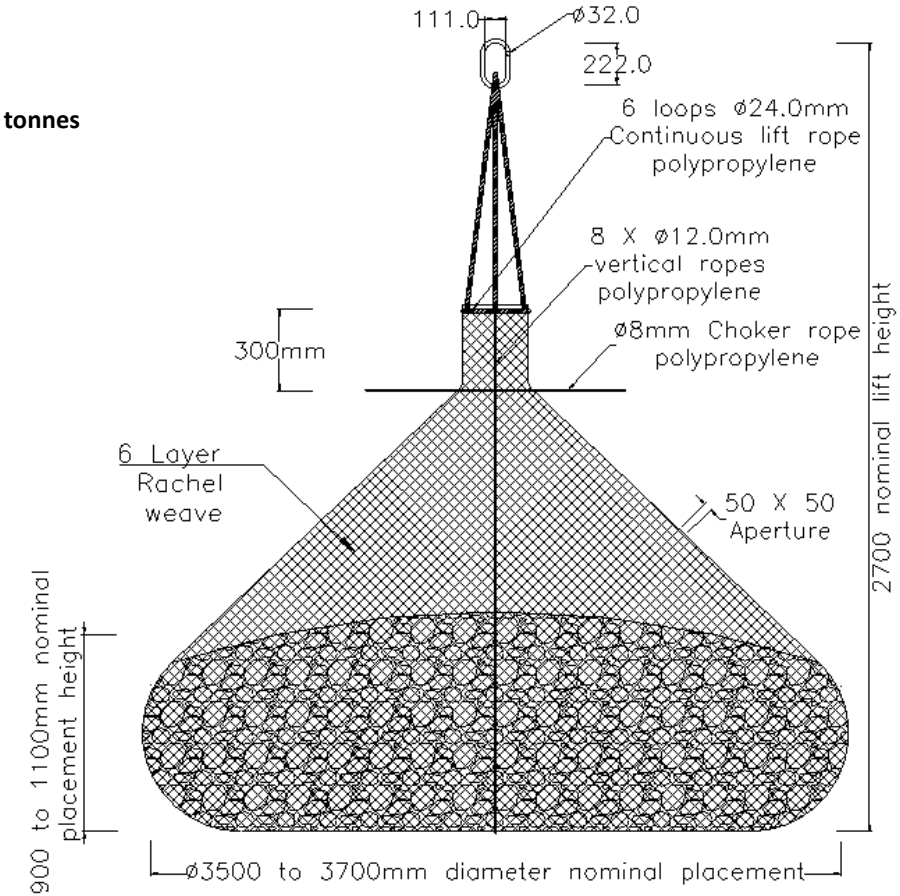
Vertical Rope WLL = 39.80 kN

Bag Assembly WLL = 771.59 kN ≈ 78.68 tonnes

Lifting System

Total Rope Legs = 12

Lifting System WLL ≈ 20.39 tonnes



ROCK BAG
FILTER UNITS

COASTAL | PORTS | HARBOURS | RIVERS

Lifespan Position Statement & Declaration of Performance

How We Talk About Lifespan

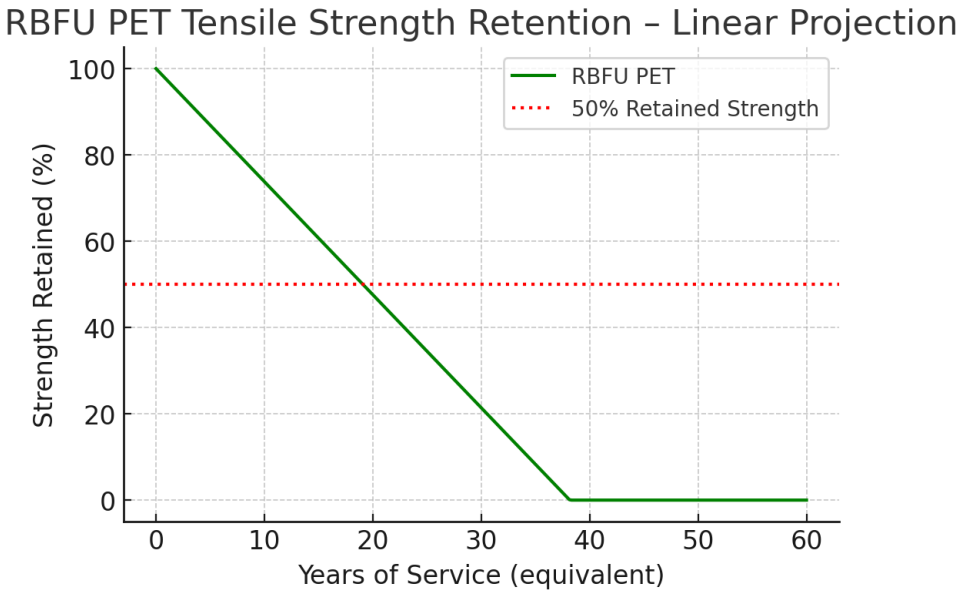
When people ask, “How long will these Rock Bag Filter Units last?” the honest answer is that our statements come from a mix of science, testing, and engineering judgement. We don’t yet have 50 years of field history because the technology itself is younger than that. What we do have are internationally recognised accelerated tests – UV resistance, hydrolysis, tensile retention – that simulate decades of exposure in a matter of months. From those results, engineers can reasonably project a design life whether 25 to 50 years or beyond.

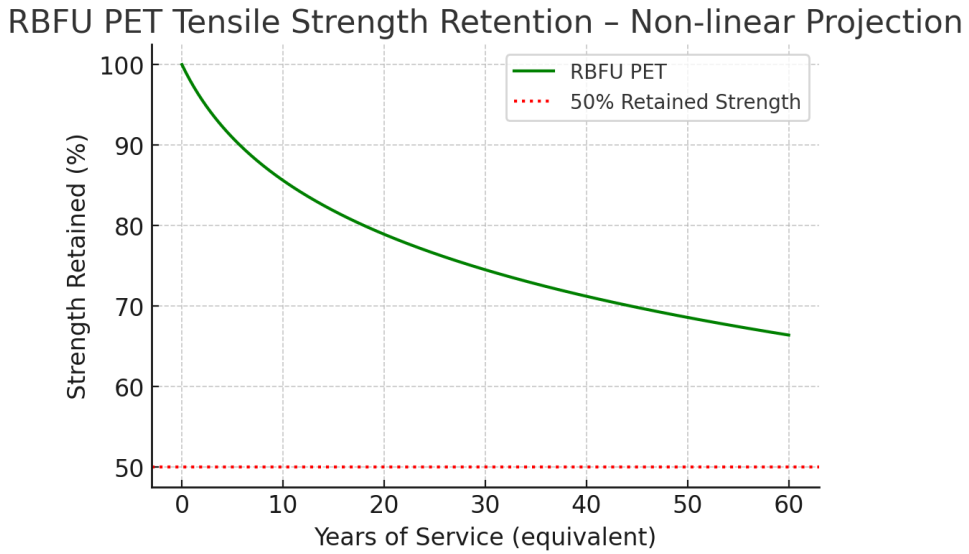
Here’s the important part: those numbers come from controlled conditions. In the real world, things are rarely controlled. A bag sitting high on a sun-exposed slope will age differently from one that’s always submerged in a river or under a bridge. Coastal environments bring salt spray and abrasion from sand. Tropical zones carry harsher UV and biological loads than temperate climates. Conversely, when bags are buried, shaded, or protected by vegetation, they often last even longer than the models suggest. So while the laboratory tells us what the polymers can do, it’s the environment that decides what they actually will do. That’s why we present lifespan as a guide, not a guarantee. It’s an informed projection – grounded in data, supported by precedent from other geosynthetics – but it will always be tempered by local conditions.

Bringing the Science Back In: 3rd Party Independent testing conducted by the Bombay Textile Research Association (BTRA) demonstrates that Rock Bag Filter Units after 500 hours of xenon arc UV exposure, Hydrolyses immersion test that on average 86.9% (MD) and 91.1% (CMD) tensile strength were retained and 90–97% strength retention respectively. If we conservatively assume 500 hours xenon arc ≈ ~5 years of natural exposure in subtropical climates, the math is straightforward, but polymers degrade logarithmically. At 13.1% loss over 5 years ≈ 2.6% per year. Linear projection gives ~33 years to 50% retained strength. Adjusted logarithmically, we can reliably achieve 40–50+ years of service life.

ROCK BAG FILTER UNITS

COASTAL | PORTS | HARBOURS | RIVERS





What the Literature Tells Us

This approach is consistent with global geosynthetic practice. The Geosynthetic Institute White Paper #6 defines service life using the “half-life” method (time to 50% retained strength). Koerner et al. (2017) applied this to geomembranes, showing buried HDPE could last hundreds of years. The Montana DEQ technical review models service life in three stages—antioxidant depletion, induction, and mechanical breakdown—again projecting very long durability when protected from UV. Industry standards such as GRI-GM13 specify HDPE geomembranes with service lives of 50–100 years when buried, while PET geotextiles in Europe are certified for up to 120 years in soil reinforcement applications.

ROCK BAG
FILTER UNITS

COASTAL | PORTS | HARBOURS | RIVERS

Contact Details

Project Material Pty Ltd

Unit 12/18 Hinkler Court

Brendale, Queensland

Australia 4500

design@projectmaterial.com.au

www.projectmaterial.com.au

PROJECT MATERIAL

GABION CAGES & BASKETS

BARRIER BAG

WATER RESTORE
Passive Barrier Filters