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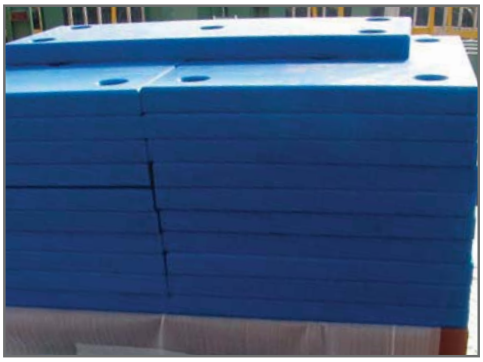
# Marine Plastics

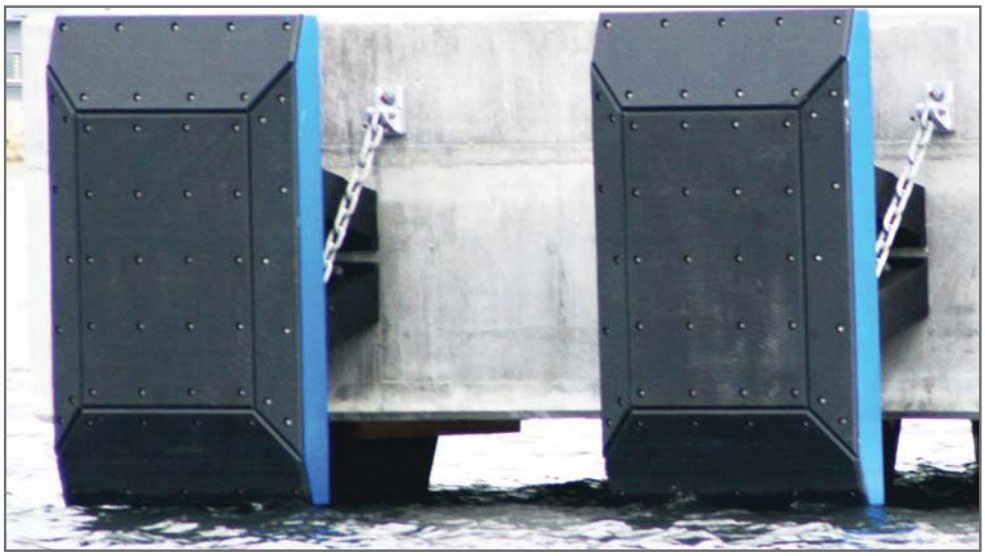
**PsG has a long experience to supply finished products in engineering plastics and we can offer a wide range of expertise and know-how within this area.**

PsG delivers standard products such as front plates in UHMW PE for our fender system, sliding fenders, composite materials for marinas and pedestrian pier constructs.

We are used to work with plastic materials such as PE, PP, PA, PETP and other engineered plastics.

You are welcome to send us enquiries.





Marine Plastics

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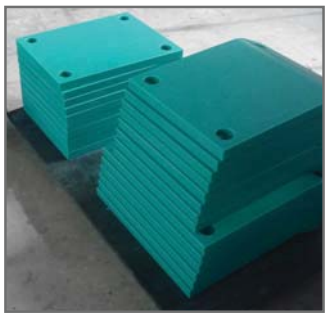
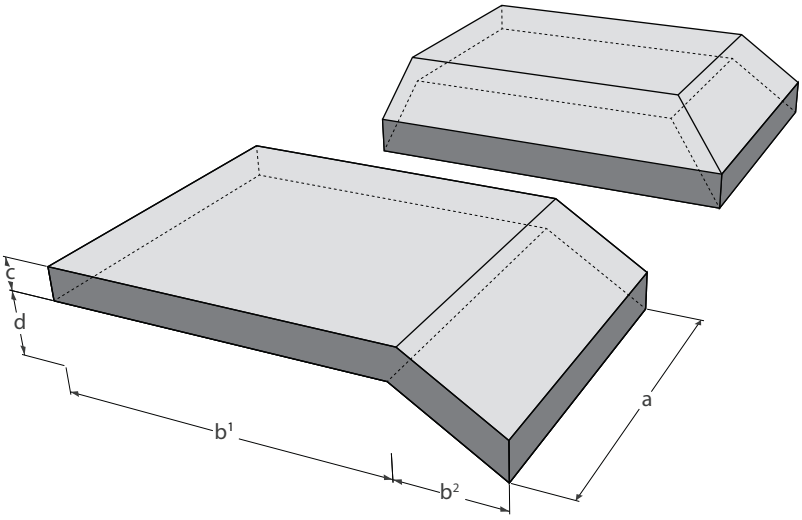
# UHMW PE Form Pads

**PsG UHMW PE form fender provides the features corrosion-free low friction, resistance to salt water, excellent tensile strength and high shock impact resistance, even at low temperatures. This set of features makes this material especially suitably for hydraulic architectures.**



The form fender is manufactured in a single process, and there is no need for a expensive machining process. This ensures a stable form and minimizes the risk of tension brake.




| | | Corner pad | | | Edge pad | | |
|---|---|---|---|---|---|---|---|
| **Thickness** | mm | 30 | 50 | 75 | 30 | 50 | 75 |
| **a** | mm | 200-1000 | 200-1000 | 200-1000 | 200-1000 | 200-1000 | 200-1000 |
| **$b^1 + b^2$** | mm | 200-900 | 200-900 | 300-850 | 200-900 | 200-900 | 300-850 |
| **$b^2$** | mm | 100 | 100 | 150 | 100 | 100 | 150 |
| **c** | mm | 30/40/50 | 30/40/50 | 30/40/50 | 30/40/50 | 30/40/50 | 30/40/50 |
| **d** | mm | 30 | 50 | 75 | 30 | 50 | 75 |

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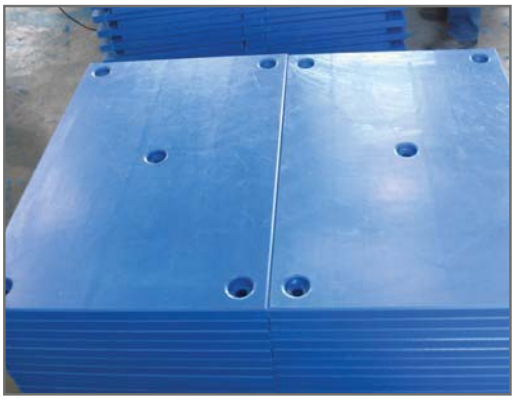
# UHMW PE

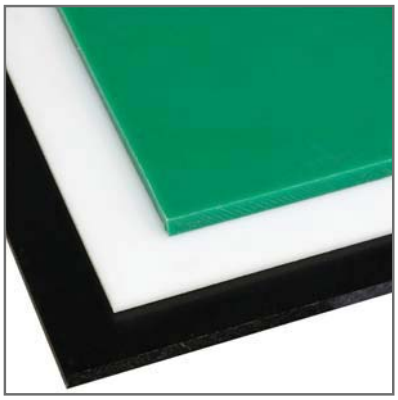
**We want to present PsG 1000 (PE-UHMW) as our "all-round material".**

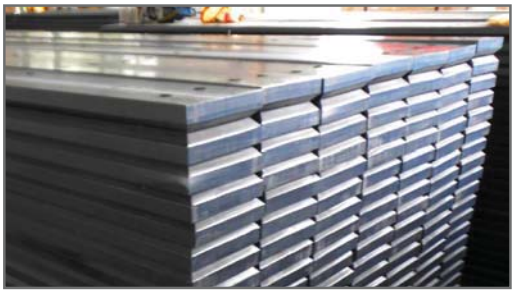
Thanks to its physical properties:

- High abrasion.
- High impact strength at low temperatures.
- Low friction.
- Chemical resistant.

These properties imply that the material can be used in a wide range of industries and machine construction. PsG 1000 is ideal for use in engineering, performance requirements, conveyor technology, but also, of course, as a low-friction material in a fender design.







UHMW PE

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# UHMW PE

## PsG 1000R, UHMW PE black multicoloured

Description: PsG 1000 R is a recycled high molecular weight polyethylene, with an extremely long molecular chain. This means that the material is extremely good properties for outdoor environments and where there are high demands on wear and tear.

| | |
|---|---|
| **Properties:** | Excellent sliding properties |
| | High wear resistance |
| | Self lubricating |
| | Chemical resistant |
| | Recyclable |
| | UV & Ozon resistant |
| **Colour:** | Black multicoloured, black, blue, green, red, yellow * |
| **Application fields:** | Slide profile and pads, Bushings, Cutting boards |

**Characteristics and standard values**

| **Mechanical data** | **Standard** | **Unit** | **Value** |
|---|---|---|---|
| Molecular weight | | g/mol | ≥3 Mio |
| Density | ISO 1183-1 | g/cm $^3$ | 114 |
| Charpy notched impact strength | ISO 11542-2 | KJ/m$^2$ | ≥70 |
| Abrasion index (Sand slurry test PsG 1000 Virgin=100%) | ISO 15527 | % | 130-150 |
| Tensile strength | ISO 527-2 /1B/50 mm/min | N/mm $^2$ | ≥20 |
| Breaking strength | ISO 527-2 /1B/50 mm/min | N/mm $^2$ | ≥20 |
| Elongation (break) | ISO 527-2 /1B/50 mm/min | % | ≥50 |
| Tensile E-modulus | ISO 527-2 /1B/50 mm/min | N/mm $^2$ | ≥700 |
| Flexural modulus | ISO 178 / ASTM D790 | N/mm $^2$ / psi | - |
| Dynamic friction µ | ASTM D 1894 | | ~ 0,10 - 0,17 |
| Static friction µ | ASTM D 1894 | | ~ 0,16 - 0,22 |
| Shore D hardness / 3 sec.value 6 m plate. | ISO 868 | Shore D | |
| Ball indentation hardness | ISO 2039 | N/mm $^2$ | 36 (± 3) |
| Water absorption | ISO 62 | % | < 0,01 |
| **Thermal data** | | | |
| Melt point (DSC) | ISO 11357-1 | °C | 133-137 |
| Operating temperature range (long term) | --- | °C | - 40 + 80 |
| Coefficient of thermal expansion | ISO 11359, 23-80 ° C | mm / mm ° C | ≈ 0,0002 |
| Thermal conductivity | Wire method | W / (K*m) | 0,41 |
| **Electrical data** | | | |
| Atec-Directive* (TUV report nr.09204555068)94/9/EG | | No | |
| Volume resistively | IEC 60093 | Ω*cm | ≤10$^{14}$ Ω*cm |
| Surface resistively | IEC 60093 | Ω | ≤10$^{13}$ Ω |
| Fire resistance | DIN 4102/UL 94 | | B2 / HB |

The above data are based upon information of the manufacturer and are given without guarantee.

* Further information by request

UHMW PE

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# Sliding Fenders

**PsG LD Sliding Fenders are solid PE profiles manufactured and machined in sizes to suit your application. Extremely hard wearing and highly resistant, they are an environmentally beneficial alternative to timber or rubber facings as well as providing a low maintenance, low friction and low cost solution.**

## Applications

PsG LD Sliding Fenders are used in many applications including the replacement of timber piles, beams and dolphins, as well as other applications where lumber would have been the traditional fender material. They are also ideal wherever the requirement is for a durable sliding surface rather than energy absorption.

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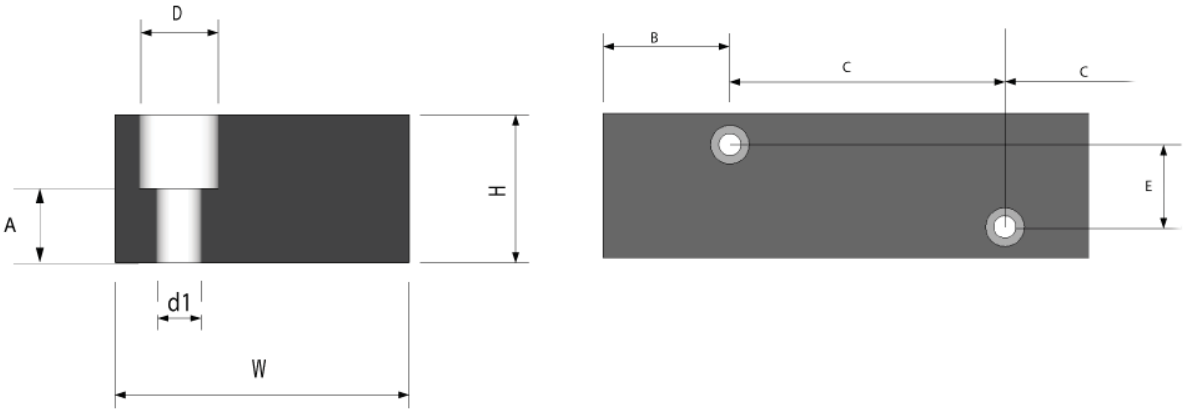
# Sliding Fenders




| Width x Hight | std length | Weight/m | A | B | C | D | d1 | E | Bolt size |
|---|---|---|---|---|---|---|---|---|---|
| 50 x 50 | 5,500 | 2,40 | 25 | 50-100 | 200-300 | 32 | 16 | 0 | M12 |
| 70 x 50 | 2,500 | 3,30 | 25 | 75-125 | 200-300 | 32 | 16 | 0 | M12 |
| 60 x 60 | 5,500 | 3,40 | 30 | 75-125 | 200-300 | 32 | 16 | 0 | M12 |
| 80 x 60 | 5,000 | 4,50 | 30 | 75-125 | 250-300 | 32 | 16 | 0 | M12 |
| 70 x 70 | 6,500 | 4,60 | 30 | 75-125 | 250-300 | 32 | 16 | 0 | M12 |
| 100 x 50 | 5,500 | 4,75 | 25 | 75-125 | 250-300 | 32 | 16 | 0 | M12 |
| 100 x 65 | 5,500 | 6,10 | 30 | 75-125 | 250-300 | 32 | 16 | 0 | M12 |
| 120 x 80 | 5,000 | 9,00 | 40 | 100-150 | 300-350 | 40 | 20 | 0 | M16 |
| 140 x 70 | 5,500 | 9,20 | 35 | 100-150 | 300-350 | 40 | 20 | 0-50 | M16 |
| 100 x 100 | 6,000 | 9,40 | 50 | 100-150 | 250-300 | 40 | 20 | 0-50 | M16 |
| 160 x 70 | 5,000 | 10,50 | 35 | 100-150 | 300-350 | 40 | 20 | 0-70 | M16 |
| 180 x 70 | 5,000 | 11,80 | 35 | 125-175 | 350-450 | 50 | 23 | 0-80 | M20 |
| 120 x 120 | 6,000 | 13,50 | 60 | 100-150 | 300-350 | 50 | 23 | 0-50 | M20 |
| 200 x 75 | 5,000 | 14,10 | 35 | 125-175 | 350-450 | 50 | 23 | 0-100 | M20 |
| 200 x 100 | 6,000 | 18,80 | 50 | 125-175 | 350-450 | 50 | 23 | 0-100 | M20 |
| 170 x 120 | 5,500 | 19,20 | 60 | 100-150 | 300-350 | 50 | 23 | 0-80 | M20 |
| 190 x 110 | 5,000 | 19,60 | 55 | 125-175 | 350-450 | 50 | 23 | 0-90 | M20 |
| 160 x 160 | 6,000 | 24,10 | 80 | 100-150 | 300-350 | 50 | 23 | 0-80 | M20 |
| 200 x 150 | 5,500 | 28,20 | 75 | 125-175 | 350-450 | 50 | 23 | 0-100 | M20 |
| 300 x 100 | 5,500 | 28,30 | 50 | 150-200 | 450-550 | 50 | 23 | 0-160 | M20 |
| 180 x 180 | 6,000 | 30,50 | 90 | 125-175 | 350-450 | 50 | 23 | 0-80 | M20 |
| 210 x 165 | 6,000 | 32,60 | 75 | 125-175 | 450-550 | 65 | 28 | 0-100 | M24 |
| 250 x 150 | 6,500 | 35,30 | 75 | 150-200 | 450-550 | 65 | 28 | 0-130 | M24 |
| 200 x 200 | 6,000 | 37,55 | 100 | 125-175 | 350-450 | 65 | 28 | 0-100 | M24 |
| 250 x 160 | 5,000 | 37,60 | 80 | 150-200 | 450-550 | 65 | 28 | 0-130 | M24 |
| 250 x 250 | 5,000 | 58,80 | 125 | 150-200 | 450-550 | 70 | 36 | 0-130 | M30 |
| 300 x 210 | 5,000 | 59,20 | 105 | 175-225 | 500-600 | 70 | 36 | 0-160 | M30 |
| 300 x 300 | 5,000 | 84,60 | 150 | 175-225 | 500-600 | 70 | 36 | 1-160 | M30 |
| 440 x 160 | 2,000 | 66,90 | 80 | 175-225 | 500-600 | 70 | 36 | 0-300 | M30 |

units ( mm, kg)

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# Sliding Fenders

Friction coefficient PEHD against steel

| Speed v (mm/sec) | Friction coefficient μ |
|---|---|
| 0,01 | 0,1159 |
| 0,04 | 0,1267 |
| 0,1 | 0,138 |
| 0,4 | 0,1578 |
| 1 | 0,1728 |
| 4 | 0,1963 |
| 10 | 0,2169 |
| 30 | 0,2443 |

| Property | Test method | Unit | Avarage value |
|---|---|---|---|
| Density | DIN EN ISO 1183-1 | $g/cm^3$ | 0,931 |
| Hardness | Shore D acc.DIN 53505 | Shore D | 48 |
| Tensile strength | DIN EN ISO 527 (lengthwise) | $N/mm^2$ | 6,8 |
| Strain at the tensile strength | DIN EN ISO 527 (lengthwise) | % | 11,2 |
| Tensile strength | DIN EN ISO 527 (across) | $N/mm^2$ | 6,2 |
| Strain at the tensile strength | DIN EN ISO 527 (across) | % | 13,2 |
| Impact strength | DIN 53453 (lengthwise) | $kJ/m^2$ | 43,7 |
| Impact strength | DIN 53453 (across) | $kJ/m^2$ | 43,7 |

The values were obtained from a number of samples with different dimensions in order to obtain such correct values as possible. However, we must point out that when specimens are cut from a produced dimension so a variance can occur in the material which can affect variability in the test results. Fixed values are performed by a test Institute, but we would like to point out that the above values are for guidance only.