



# MultiFunction Boom™ Series

## DESIGN

Pacific Netting Products' MultiFunction Booms (U.S. Patent No. 29,610,480) are designed to provide a low-maintenance, highly versatile floating barrier system at an affordable price. Designed for a service life of 50 years, MultiFunction Booms are watertight, corrosion-free, rot-resistant, UV-stable and capable of withstanding temperatures to -140°F. They are constructed with very few moving parts and customized (e.g., diameter and wall thickness) to support site-specific load requirements. Modular and available in various lengths, MultiFunction Booms are compatible with PNP's wide selection of accessories that allow them to be configured or customized to address unique fish passage, debris, ice, security, safety, environmental, operational, or structural requirements.

## MATERIAL DETAIL

MultiFunction Booms are manufactured using custom extruded, high density polyethylene (HDPE) PE4710 material that conforms to ASTM D3350 with the cell classification of 445574C/E. These booms can be filled with type 1, closed cell, expanded polystyrene foam logs, conforming to ASTM C578, and sized to fit the I.D. of the boom.

MultiFunction Booms are formulated with minimum of 2% carbon black and/or ultraviolet stabilizer for maximum protection against UV rays for added assurance. The smooth, non-stick surface of HDPE results in low friction factors with exceptional resistance to fouling. To meet the unique requirements of many applications, these booms offer the capacity for high deformation without fracture (strain-ability) and are suitable for grounding on a regular basis. MultiFunction Booms can also be manufactured using co-extrusion to provide a highly visible color (e.g., yellow or orange). Co-extrusion lowers operation and maintenance costs by offering superior impact resistance and coating resilience.



### ► Modular

Length, diameter, wall thickness, and connections to fit site-specific requirements.

### ► Strong

Heavy-duty, bullet-proof MultiFunction Booms serve as a strength member with no wire, chains, or cables.

### ► Cost effective

Long post-installation life expectancy, little maintenance required. Often the lowest lifetime cost in the industry.

### ► Flexible

Attachments allow the booms to be configured or customized to address unique requirements.

## SIZES

Standard MultiFunction Boom Sizes									
	Class 1A			Class 2			Class 3		
Boom Size	Min. Wall	Weight	Safe Pull	Min. Wall	Weight	Safe Pull	Min. Wall	Weight	Safe Pull
Dia.	(inches)	(lbs./ft.)	(pounds)	(inches)	(lbs./ft.)	(pounds)	(inches)	(lbs./ft.)	(pounds)
18	1.05	24.77	78,894	0.69	16.54	52,701	0.55	13.36	42,498
24	1.41	44.03	140,256	0.92	29.42	93,690	0.73	23.72	75,552
30	1.76	68.80	219,151	1.15	45.98	146,391	0.92	37.09	118,050
36	2.11	99.07	315,577	1.38	66.22	210,803	1.10	53.42	169,991

## TYPES OF BOOM SECTIONS AND CONNECTIONS

### FLANGE BOLTED SECTIONS

When boom sections can be flange-bolted together, the entire boom becomes the structural load member, with no moving parts between boom sections. In addition to providing strength, this methodology is ideal for applications where debris exclusion or guidance is necessary; the resulting uniform boom surface, without gaps between sections, prevents debris from becoming impinged on the boom. When sections are positioned properly, prevailing winds and current can assist in guiding floating debris toward a collection point.

Section lengths are usually 20 to 50 feet but can be made to suit any size required. Sections are bolted together using A325 galvanized steel backer rings and hardware. Figure A shows the debris skirt (in black) below the boom, Figure B is a typical flange-bolted connection, and Figure C is an installation where debris exclusion and guidance reduce the operation and maintenance cost of the facility.

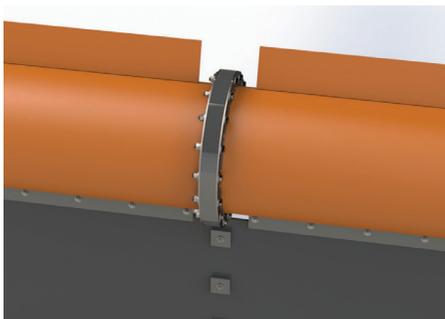


Figure A



Figure B



Figure C

## ARTICULATING SECTIONS

To accommodate pool fluctuation, provide roll prevention between sections and shore connections, or to reduce installation expense, MultiFunction Booms are fitted with padeye (Figure D) or universal link connections (Figure E) that are sized to match the safe working load of the boom. Boom sections are generally shorter and, in the case of shore sections, the boom lengths are designed to fit a site's unique bathymetry.

The standard padeye is built with A572 high-strength low-alloy steel plate fitted with galvanized finish padeye and domestic safety anchor shackles. A galvanized A36 backing plate is installed behind the HDPE end flange. The entire assembly is bolted together in a sandwich fashion. With the padeye fitting, shackles and chain can be attached to connect to shore side anchors.

Figure F shows a padeye connection to an anchor slider assembly, which allows full vertical movement for maximum flexibility. When completed, boom sections with different types of fittings can be connected for site-specific solutions.

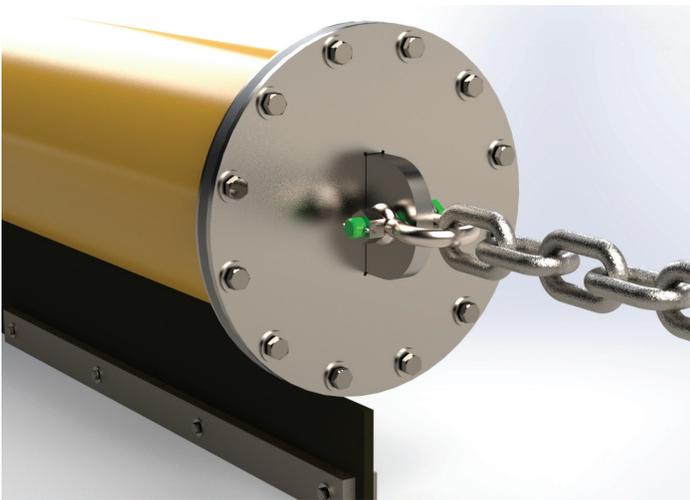


Figure D

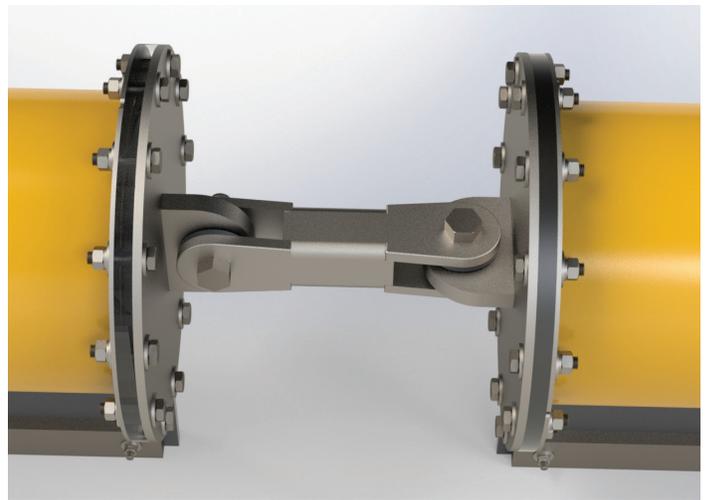


Figure E

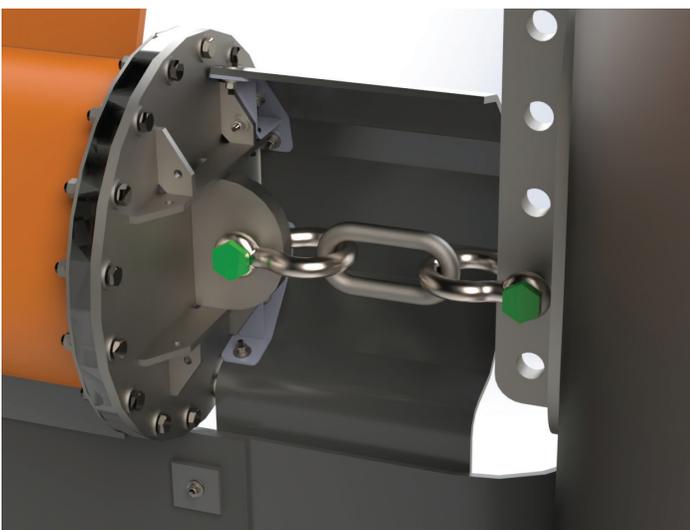


Figure F

## CONNECTIONS

To enhance safety, efficiency and reduce operations and maintenance, standard MultiFunction Boom sections have no moving connections located below the waterline. In addition, all connections between booms (including boat gates) are designed and rated to match boom breaking strengths, except in the case of safety connections designed to part at a pre-determined load.



Figure G

## DEBRIS SKIRT

At some sites, MultiFunction Booms are installed with a continuous length, heavy-duty, four-ply poly-nylon debris guidance skirt. Built generally with a depth of 48 inches, the skirt is permanently attached to the boom keel to allow debris to easily move along the face of the boom, rather than getting entrained in porous, steel screens. (See Figure G.) This design allows debris to be guided with the assistance of wind and current to a point on shore for removal. The skirt is resistant to impacts, tearing, and abrasion. It is flexible and weighted with galvanized chain in areas where the skirt may be in contact with the substrate at low pool and, in all other areas, weighted with steel weight bars.

## DEBRIS OVERTOPPING GUARD (SPLASHGUARD)

To help prevent debris from splashing over the top of the boom, a debris overtopping guard runs the entire length of each boom section on the upstream side of the boom. Working like the bow of a boat, its flare prevents waves and debris from rolling over the top of the boom and provides the boom with additional freeboard. (See Figure H.) This is ideal for sites where increased debris deflection or wave attenuation is required, such as fish collection facilities.



Figure H

## CUSTOMIZATION

MultiFunction Booms are modular and can be customized to fit a variety of strength, security, or operational requirements. Fittings for walkways, structures for ice booms, methods for wave attenuation, or designs for ballasted portions of booms or turning points can be produced using our patented design. A double boom might provide improved operational success on steep shorelines where grounding is expected or it may offer a more stable platform for lights and signs. Booms can allow for the fitting of signs, navigation lights, security fences, safety or other attachments as required by the site. (See Figures I through L.)



Figure I



Figure J



Figure K



Figure L

## BOAT GATES

To prevent the passage of unauthorized vessels and allow vessels operated by project staff access to restricted areas, the heavy-duty PNP Boat Gate is designed so that a single boater can easily open or close the gate from either side of the boom using a safe gate latch with a long surface-mounted gate bar. Built with rigid, heavy-duty galvanized steel and a box frame construction, the gate becomes an integral part of the debris boom. The gate can be locked in an open or closed position. Rubber skirting is placed between boom and boat gate to prevent debris from passing through gaps. (See Figures M, N, and O.)



Figure M



Figure N



Figure O

## COLOR

MultiFunction Booms can be delivered with standard black or HDPE color (RAL 2009 orange) or (RAL 1021 yellow) to meet regulatory requirements. Custom colors are available.

## WARRANTY

PNP provides an industry-leading 10-year watertight warranty. Details on request.

## A CLOSER LOOK AT HDPE MANUFACTURING

PNP uses customized and proprietary manufacturing processes to produce its MultiFunction Boom Series. The raw materials are extruded in a continuous surface method of production. In addition to tensile or safe pull strength and consistent cross sections (wall thickness), the other benefit of this method of manufacture is the consistency of the finished material properties, which are defined in standards such as ASTM D3350 describing key properties and ranges of performance.

During the manufacturing process, plastic pellets or powder are mixed with other materials, such as UV inhibitors and then pushed through the die. Because higher operating pressures are created during the extrusion process, higher density resins can be used. Together, the materials and manufacturing process make MultiFunction Booms ideally suited for debris, demarcation, and security applications.

## A CLOSER LOOK AT HDPE CO-EXTRUSION MANUFACTURING

When a structure requires greater visibility than what is offered by standard black, PNP offers a full line of colorful co-extrusion MultiFunction Boom products. In standard HDPE extrusion, solid plastic pellets are gravity-fed into a forming mechanism, where jacketed compression screws melt and feed the materials into a die. Co-extrusion involves multiple extruders of different pigments and, if necessary, properties forming a homogeneous product. PNP's HDPE co-extrusion products do not chip, peel, or fade and are the obvious choice when demarcation and impact resistance is essential. Co-extrusion has the same service life and superior impact resistance as the standard black HDPE with the added value of color and superior coating resilience.



### About PNP

PNP's administrative headquarters and manufacturing facility are located in Kingston, Washington, USA. As a family-owned and operated company, PNP was founded on the principle that listening carefully to customers is the best way to deliver the quality they need and surpass the service they expect. PNP has been manufacturing and supplying systems since 1997, so we know what it takes to successfully execute and deliver a project on schedule and within budget.