



## Standard Terminology Relating to Spill Response Barriers<sup>1</sup>

This standard is issued under the fixed designation F 818; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This document defines the terminology used in the field of spill response barriers. Only those terms commonly used or peculiar to this field have been included; no attempt has been made to list all terms used. Where a second term is in common use, “aka” is used to mean “also known as.”

1.2 Design, engineering, and performance terms are listed separately: barrier design terminology (3.1), barrier engineering terminology (3.2), and barrier performance terminology (3.3).

### 2. Referenced Documents

#### 2.1 ASTM Standards:

F 625 Practice for Classifying Water Bodies for Spill Control Systems<sup>2</sup>

### 3. Terminology

3.1 *Barrier Design Terminology*—Terms associated with Spill Response Barrier Design:

#### General

**boom**—floating mechanical barrier used to control the movement of substances that float.

**boom section**—length of boom between two end connectors.

**boom segment**—repetitive identical portion of the boom section.

#### Types

**air bubble barrier**—special-purpose barrier created by rising stream of air bubbles and entrained water, produced by injecting air at some depth below water surface.

**bottom-tension boom**—boom with tension member located along the bottom of the skirt.

**calm water boom**—boom intended for use in calm waters (see Practice F 625 for environmental descriptors).

**“curtain type” boom**—boom consisting of a flexible skirt

supported by flotation.

**“fence type” boom**—boom consisting of a self-supporting or stiffened membrane supported by flotation.

**fire resistant boom (aka fire containment boom)**—boom intended for containment of burning oil slicks.

**ice boom**—boom intended for use in ice-infested waters, designed to withstand effects of ice contact.

**inflatable boom**—boom that uses inflated gas-filled chambers as the flotation.

**net boom**—special purpose boom in which all or part of the membrane material is netting.

**open water boom**—boom intended for use in open waters (see Practice F 625 for environmental descriptors).

**permanent boom**—boom intended for long-term or permanent deployment.

**plunging water jet barrier**—special purpose barrier created by a series of coherent streams of water directed vertically downward into a body of water.

**protected water boom**—boom intended for use in protected waters with moderate environmental conditions (see Practice F 625 for environmental descriptors).

**river boom (aka fast water boom)**—boom intended for use in currents greater than 1 knot.

**shore seal boom**—boom that, when grounded, seals against the shoreline.

**silt barrier**—boom with very deep skirt used to control the movement of suspended sediments.

**sorbent boom**—sorbent material contained or arranged in the form of a long cylinder.

**special purpose boom**—boom that departs from the general characteristics of “fence type” and “curtain type” booms, either in design or intended use.

**submersible boom**—boom that normally resides on the seabed and is positioned by inflating with air, causing it to rise to the water surface.

**water jet barrier**—barrier created by stream of pressurized water spray directed across the water surface.

**weir boom (aka skimming boom/barrier)**—boom that has a weir skimming device(s) built into its face.

#### Components

**accessories**—*optional* mechanical devices used on or in conjunction with a boom system but not included with the basic

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee F20 on Hazardous Substances and Oil Spill Response and is the direct responsibility of Subcommittee F20.11 on Control. Current edition approved May 15, 1993. Published July 1993. Originally published as F 818 – 84. Last previous edition F 818 – 86.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.04.

boom and end connector; for example, lights, paravanes, drogues, buoys, anchor systems, storage bags, boxes or reels, bulkhead connectors or repair kits, and so forth.

**anchor point**—structural point on the end connector or along the length of a boom section designed for the attachment of an anchor or mooring lines.

**ancillary equipment**—mechanical devices *essential* to the operation of a given boom system; for example, air pumps, hydraulic power supplies, control manifolds, and so forth.

**ballast**—weight applied to the skirt to improve boom performance.

**bridle**—device attached to a boom to distribute the load exerted by towing or anchoring the boom.

**buoyancy chamber (aka flotation chamber)**—enclosed compartment of air or other buoyant material providing flotation for the boom.

**end connector**—device permanently attached to the boom used for joining boom sections to one another or to other accessory devices.

**external flotation (aka outboard flotation)**—flotation element located external to the boom membrane.

**external tension**—external tension member separated from the boom membrane by bridles.

**fin**—portion of the boom membrane above the float.

**float**—separable component of a boom that provides buoyancy.

**flotation**—portion of a boom that provides buoyancy.

**handhold**—any strap, handle, depression, or other provision for grasping the boom by hand.

**hinge**—location between boom segments at which the boom can be folded back 180° upon itself.

**internal flotation**—flotation element located within the boom membrane.

**lifting point**—structural point on the end connector or along the length of a boom section designed for the attachment of a lifting device, such as a crane.

**membrane**—continuous portion of a boom that serves as a barrier to the movement of a substance.

**pressure inflated**—inflatable boom that requires pressurized gas for its flotation.

**self-inflating**—boom that automatically inflates as it is deployed.

**skirt**—continuous portion of the boom below the floats.

**solid flotation**—boom that uses solid buoyant material for the flotation element.

**stiffener**—component that provides support to the membrane.

**tension member**—any component that carries horizontal (axial) tension loads imposed upon the boom.

### Characteristics

**boom weight**—dry weight of a fully assembled boom section including end connectors.

**compactibility**—measure of a boom's storage volume per unit length (m<sup>3</sup>/m).

**draft**—minimum vertical depth of the membrane below the water line.

**freeboard**—minimum vertical height of the boom above the waterline.

**height**—sum of draft and freeboard.

**maximum draft**—maximum vertical dimension of the boom below the water line.

**overall height**—maximum vertical dimension of boom.

3.2 *Barrier Engineering Terminology*—Terms associated with Spill Barrier Engineering:

**catenary drag force**—load imposed on a boom, deployed in a catenary configuration, resulting from towing, current, and/or wind forces.

**current response**—change in freeboard or draft due to current forces acting to displace the boom from rest.

**gross buoyancy**—weight of fresh water displaced by a boom totally submerged.

**gross buoyancy to weight ratio**—gross buoyancy divided by boom weight.

**heave response**—ability of the boom to react to the vertical motion of the water surface.

**maximum dynamic load**—sum of all instantaneous dynamic loads including those due to acceleration, wave forces, and so forth.

**reserve buoyancy**—gross buoyancy minus boom weight.

**reserve buoyancy to weight ratio**—reserve buoyancy divided by boom weight.

**roll response**—rotation of the boom from rest due to wave, wind, or current forces.

**straight line drag forces**—load on a boom that results from towing it from one end.

**wind response**—change in freeboard or draft due to wind force acting to displace the boom from rest.

3.3 *Barrier Performance Terminology*—Terms associated with Spill Response Barrier Performance:

**apex (aka pocket)**—pocket formed at the downstream end of a U, V, J, or W shaped configuration.

**boom planing**—heeling over of a boom and loss of draft.

**boom submergence (aka submarining)**—containment failure due to loss of freeboard.

**bridging failure**—portions of a boom emerging from the water due to poor wave conformance, with resulting containment failure.

**catenary configuration (aka “U,” “J” configuration)**—booming configuration formed by towing or anchoring each end of a length of boom, resulting in a characteristic “U” or “J” shape.

**cascading booms**—booming configuration formed by positioning two or more booms in a deflection mode such that successive booms progressively move oil to the desired area.

**chevron configuration**—booming configuration used in narrow watercourses, formed by positioning two lengths of boom in a deflection mode, the leading end of each length is positioned in the middle of the watercourse and the trailing ends lead to opposite shores.

**conformance**—ability of a boom to maintain freeboard and draft when subjected to a given set of environmental conditions.

**containment mode**—placement of a boom to prevent free movement of a floating substance.

**deployment**—placing a boom in the water and making it operational.

**diversion mode**—placement of a boom to redirect the movement of a floating substance.

**drainage loss**—oil accumulating and pooling against the boom skirt and escaping with the flow of water down and along the skirt.

**entrainment loss**—oil droplets escaping with the flow of water diverted under the skirt.

**exclusion booming**—placement of a boom to protect an area from the entry of a floating substance.

**first-loss tow/current velocity**—minimum tow/current velocity normal to the membrane at which oil escapes past a boom.

**gap ratio**—sweep width divided by boom length.

**loss rate**—rate at which oil is lost past a boom ( $\text{m}^3/\text{h}$ ).

**performance**—ability of a boom to contain or deflect oil under a given set of environmental conditions.

**retrieval**—removing a deployed boom from the water.

**splashover**—oil splashing over a boom’s freeboard.

**stability**—resistance to overturning moment.

**sweep width (aka swath)**—width intercepted by a boom in collection mode, the projected distance between the ends of a boom deployed in a “U,” “V,” or “J” configuration.

**sweeping mode**—movement of a boom relative to the water for the purpose of controlling or collecting a floating substance.

**towing**—transporting a boom from one place to another by pulling from one end.

**vortex loss**—oil escaping past a boom due to drainage vortices produced at the boom.

**“J” configuration**—boom positioned in a “J” shape.

**“U” configuration (aka catenary configuration)**—boom positioned in a “U” shape.

**“V” configuration**—boom positioned in a “V” shape.

**“W” configuration (aka “3” configuration)**—boom positioned in a “W” shape.

*ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).*