



## Standard Guide for Installation of Paintball Barrier Netting<sup>1</sup>

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### INTRODUCTION

This guide is intended to outline installation requirements for the safe and effective installation of paintball barrier netting. The proper installation of safe paintball barrier netting at paintball playing facilities is critical to protect non-players from accidental impact of a paintball.

Paintball is a sport that, like all sports, has intrinsic hazards for the active participants. These hazards include being hit by paintballs. Spectators not separated from the active playing field by an appropriate barrier can experience accidental impact of a paintball. Although surrounding an active playing field with paintball barrier netting cannot eliminate all injuries, paintball barrier netting can substantially reduce the severity and frequency of injuries when properly installed.

This guide is written within the current state-of-the-art of paintball barrier netting technology. The intent is to revise this guide whenever substantive information becomes available that justifies revising existing requirements or adding new requirements.

### 1. Scope

1.1 This guide provides recommendations for the installation of paintball barrier netting that may be used to delineate playing fields, chronograph areas, target ranges, and other “goggle-on” areas of an active paintball site.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units in parentheses are provided for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

F1979 [Specification for Paintballs Used in the Sport of Paintball](#)

F2272 [Specification for Paintball Markers](#)

F2278 [Test Method for Evaluating Paintball Barrier Netting](#)

### 3. Terminology

#### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *barrel, n*—that portion of a paintball marker through which the paintball is discharged.

3.1.2 *billowing, n*—lateral movement of the netting that may occur from influence of the wind.

3.1.3 *muzzle, n*—the end of the barrel at which the ball exits the barrel.

3.1.4 *paintball, n*—a spherical ball, commonly with a diameter of 17.3 mm (0.68 in.), composed of a shell and a fill, that is designed to be expelled from a paintball marker and conforms to Specification F1979.

3.1.5 *paintball barrier netting, n*—netting used in the sport of paintball as a protective barrier.

3.1.6 *paintball marker, n*—~~a device specifically designed to discharge paintballs. The device is sometimes referred to as a paintball gun.~~ a device specifically designed to discharge paintballs that conforms to Specification F2272.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.7 *SAT* (Standard Ambient Temperature), *n*—used to describe a substance at a temperature of  $25 \pm 2^\circ\text{C}$  ( $77 \pm 4^\circ\text{F}$ ).

3.1.8 *shell*, *n*—a rigid to semi-rigid material (generally of gelatin) that encapsulates the fill of a paintball.

#### 4. Significance and Use

4.1 This guide recommends minimum installation requirements to provide a reasonable degree of safety in the normal use of paintball barrier netting.

#### 5. General Requirements

5.1 *Layout* (see Fig. 1):

5.1.1 Paintball barrier netting shall be installed not closer than  $6.10 \pm 0.15$  m ( $20.0 \pm 0.5$  ft) from the playing field boundary line.

5.1.1.1 If the  $6.10 \pm 0.15$  m ( $20.0 \pm 0.5$  ft) buffer zone cannot be respected due to space constraints, the netting must conform to 5.2.1 at the distance of closest approach.

5.1.2 A spectator exclusion zone will extend a minimum of  $0.61 \pm 0.15$  m ( $2.0 \pm 0.5$  ft) beyond the paintball barrier netting allowing for billowing.

5.2 *Paintball Barrier Netting Performance Testing*:

5.2.1 At the point of closest approach as defined in 5.1 and upon discharge of a paintball from a paintball marker, the paintball barrier netting must prevent an intact paintball from passing the paintball barrier netting and shall not allow shell fragments larger than  $3 \times 5$  mm ( $0.118 \times 0.197$  in.) to pass the paintball barrier netting. New installations of paintball barrier netting shall be tested in accordance with the procedure described in Test Method F2278 prior to use.

5.2.2 Existing installations of paintball barrier netting are effected by various factors such as wind, rain, animal population, etc., and should be inspected on a regular basis to confirm the integrity of the installation. This inspection must include impact testing of the paintball barrier netting based on Test Method F2278.

5.3 *Installation*:

5.3.1 Netting should be installed in a manner that substantially reduces the likelihood of a paintball injuring spectators or players located in areas where eye protection is not required. Recommended practices include and are not limited to:

5.3.1.1 Where top enclosures are not used or available, netting shall be a minimum of 3.7 m (12 ft) high. The use of berms is allowed as a barrier. The combined height of the berm and netting should be a minimum of 3.7 m (12 ft) above the playing surface. If spectators are allowed to stand on the berm, the netting must extend a minimum of 2.1 m (7 ft) from the top of the berm.

5.3.1.2 Vertical supports for netting shall be of sufficient strength and length to support netting in condition that it is to be used (for example, indoors, outdoors with breeze, etc.).

5.3.1.3 Vertical supports should be spaced not more than  $7.6 \pm 0.15$  m ( $25.0 \pm 0.5$  ft) apart.

5.3.1.4 Netting sag between vertical supports should not exceed  $30.5 \pm 2.5$  cm ( $12 \pm 1$  in.).

(1) The use of a 0.95-cm ( $\frac{3}{8}$ -in.) steel cable or equivalent strung across the top of the vertical supports through eyebolts with a 5-cm (2-in.) inside diameter (ID) will reduce sag between the vertical supports.

5.3.1.5 If netting traverses a vertical support, it should be kept a minimum of 10 cm (4 in.) from the support to reduce wear on the net and mounted on the interior of the vertical supports (see Fig. 2).

5.3.1.6 The bottom of the net should be secured to reduce the ability to lift the netting between the vertical supports.

(1) The use of a 0.95-cm ( $\frac{3}{8}$ -in.) steel cable or equivalent strung across the bottom of the vertical supports through eyebolts with a 5-cm (2-in.) ID is effective in reducing lift.

(2) The use of pegs spaced  $61.0 \pm 2.5$  cm ( $24 \pm 1$  in.) apart and extending a minimum of 15.2 cm (6 in.) into the ground or equivalent will reduce lifting of the bottom of the net.

5.3.1.7 Sufficient means of fastening the netting to the top and bottom horizontal supports are required.

(1) Tie-wraps or equivalent spaced  $15.2 \pm 2.5$  cm ( $6 \pm 1$  in.) can be used.

5.3.1.8 Where cables or ropes are used in the installation, the use of turnbuckles to tension cables or ropes is recommended.

5.3.1.9 Billowing of the netting should be reduced. The use of a 6.35-mm (0.25-in.) nylon rope or equivalent can be zigzagged across the netting. One cable should pass on the interior of the field while the second passes in an opposite direction on the exterior of the field (see Fig. 3).

5.4 *Entrances*:

5.4.1 Entrances to the playing field shall be designed to prevent a paintball from passing through in a straight line.

5.4.2 A recommended configuration is a zigzag (see Fig. 4).

5.5 *Joints*:

5.5.1 All joints shall consist of a rolled or bunched joint consisting of netting overlapped by a minimum of  $15.2 \pm 1$  cm ( $6 \pm 0.5$  in.) and be fastened with tie-wraps or equivalent at  $15.2 \pm 2.5$  cm ( $6 \pm 1$  in.) intervals (see Figs. 5-7).

5.6 *Repairs*:

5.6.1 Repairs to the netting shall consist of patches that extend  $15.2 \pm 2.5$  cm ( $6 \pm 1$  in.) in all directions and are fastened to the inside of the netting with tie-wraps or equivalents at  $7.6 \pm 1$  cm ( $3 \pm 0.5$  in.) intervals (see Fig. 8).

#### 6. Keywords

6.1 paintball; paintball sports; paintball markers; paintball barrier netting