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Standard Terminology Relating to Inflatable Restraints¹

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1. Scope

1.1 This standard covers terminology which is used in the evaluation of inflatable restraint fabrics, cushions, and modules.

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D123 [Terminology Relating to Textiles](#)

D3990 [Terminology Relating to Fabric Defects](#)

3. Terminology

3.1 *Definitions:*

abrasion, *n*—for inflatable restraint fabrics, a fuzzy cluster of broken filaments damaged by scraping.

accelerated aging, *n*— in textile processing and testing, the use of controlled environmental conditions to promote rapid physical or chemical change in a textile material.

DISCUSSION—For inflatable restraints, practices for conducting accelerated aging are designed to determine the aggravated effects on a fabric from exposures to heat, humidity, or ozone, or a combination thereof. These environmental conditions may also be cycled in combination. The four accelerated aging procedures of concern to the design and manufacture of inflatable restraints are referred to as cycle aging, heat aging, humidity aging, and ozone aging.

adhesive failure, *n*—for inflatable restraint sealed and sewn seams, a failure of seam sealant at the interface of two substrates where the sealant is sheared such that a portion of the sealant greater than 90 % of the original thickness of the

sealant layer must remain attached to one of the two substrate surfaces, while a portion of the sealant less than 10 % of the original thickness of the sealant layer must remain attached to the other of the two substrate surfaces.

air splice, *n*—for inflatable restraint fabrics, the thicker portion of a yarn resulting from the entanglement of the filaments at the ends of two multifilament yarns to create a continuous yarn.

average dynamic air permeability (ADAP), *n*—for inflatable restraints, the average of all of DAP measurements within a specified range of pressure differentials.

bleedthrough, *n*— for coated inflatable restraint fabrics, the presence of coating material on the uncoated side, between two yarns, without covering either yarn.

blip, *n*—for inflatable restraint fabrics, any short, irregularly shaped or textured portion of an individual multifilament yarn that has been woven into the fabric, including slough offs, stripbacks, fuzz balls, snarls, and slubs.

breakout pressure, *n*— for inflatable restraints, the pressure level during deployment which ruptures the module cover.

broken filament, *n*— for inflatable restraint fabrics, an individual filament, separated from a multifilament yarn bundle, that lies on the surface of the fabric.

bruise, *n*—for inflatable restraint fabrics, a shift in the squareness of the weave pattern in an area that has been subjected to impact or pressure.

coated fabric, *n*—a flexible material composed of a textile fabric and an adherent polymeric material applied to one or both sides.

coating slub, *n*— for coated inflatable restraint fabrics, an irregularly shaped lump of coating material on the surface of the coated layer resembling a yarn slub.

coating streak, *n*— for coated inflatable restraint fabrics, minor variation in the color or opacity of the coated layer.

coating transfer, *n*— for coated inflatable restraint fabrics, the presence of coating material on the uncoated side, covering one or more yarns.

¹ This terminology is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.20 on Inflatable Restraints.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

cohesive failure, *n*—for inflatable restraint sealed and sewn seams, a failure of seam sealant at the interface of two substrates where the sealant is sheared such that a portion of the sealant greater than 10 % of the original thickness of the sealant layer must remain attached to both of the two substrate surfaces.

contamination, *n*—for coated inflatable restraint fabrics, the presence of non-coating material in the coated layer.

cushion, *n*—for inflatable restraints, the inflatable fabric envelope portion of a module.

cushion overpressurization, *n*—for inflatable restraints, the process of inflating a cushion at internal pressures greater than design deployment pressures; bag burst.

defect, *n*—specific for inflatable restraints, an imperfection in a cut piece of fabric that judgment and experience indicate is likely to result in either hazardous or improper deployment of the inflatable restraint module in which the imperfection is incorporated.

DISCUSSION—An example of a defect is a hole in the piece of fabric through which inflation gases can vent improperly.

deployment, *n*—for inflatable restraints, the sequence of events related to the activation of a module.

dynamic air permeability (DAP), *n*—for inflatable restraints, the dynamic air permeability measured at a single specified pressure differential.

edgecombing, *n*—for inflatable restraints, the separation of yarns from their normal orthogonal configuration in a woven fabric due to seam stress or similar action near the edge of a cut part

environmental conditions, *n*—in textile testing, the atmosphere in which specified moisture levels, temperature ranges, and concentrations of gases are controlled.

exponent of dynamic air permeability (EXP), *n*—for inflatable restraints, a descriptive factor used in a mathematical model integral to the apparatus software which relates the change in dynamic air permeability as the pressure differential changes.

extractable matter, *n*—for inflatable restraint fabrics, non fibrous material in or on a textile, not including water, which is removable by a specified solvent or solvents, as directed in a specified procedure.

filling bar, *n*—for inflatable restraint fabrics, a temporary change in the filling-wise density of the weave pattern. (Syn: stop/start mark.)

finished, *adj*—for inflatable restraint fabrics, a descriptive term for fabric that has been treated after weaving and that is suitable for coating or piece cutting.

flat fabric, *n*—for inflatable restraints, fabric composed of a single woven layer. (See also one-piece woven).

fold over, *n*—for inflatable restraint fabrics, a hard ridge where a layer is overlapped upon itself where if applicable coating integrity is compromised.

foreign matter, *n*—for inflatable restraint fabrics, an extraneous interwoven fragment whose size, color, or texture indicates that it is not of the same material as the fibers in the base fabric.

grading, *n*—the procedure used to identify and quantify the number of imperfections in a roll of fabric detected during visual inspection.

hard contamination, *n*—for coated inflatable restraint fabrics, the presence of non-coating material within or on the coating layer, such material visibly appearing to be of large size, coarse or sharp in texture, and of a thickness that protrudes significantly above the surface of the coating layer.

DISCUSSION—Examples are metal filings, glass, plastic, or wood splinters.

DISCUSSION—Side lighting of fabric during fabric inspection may be used to determine how significantly contamination protrudes from the surface of the fabric.

heavy coating streak, *n*—for coated inflatable restraint fabrics, a narrow area of fabric, generally in the shape of a line oriented in the warp direction of the fabric, in which the coating layer is visibly at a higher rate of coverage than the surrounding material.

hole, *n*—for inflatable restraint fabrics, an opening not characteristic of the normal weave pattern where one or more yarns is cut, torn, or shifted.

imperfection, *n*—a departure of a quality characteristic from its intended level or state.

inflatable restraint, *n*—a vehicular safety device designed to cushion an occupant or equipment during collision; an airbag.

inflator, *n*—for inflatable restraints, a device for generating and directing expansion gases into a cushion.

ink stain, *n*—for inflatable restraint fabrics, presence of marking ink in an area of fabric not provided for identification by an applicable specification.

inspection, *n*—in fabric grading, the process of viewing, measuring, examining, or otherwise comparing the visual characteristics of a fabric with applicable requirements.

kinky filling, *n*—for inflatable restraint fabrics, an area of the fabric in which a short section of the weft yarn is folded back upon itself, causing the appearance of a thick or heavy section of yarn. This is contrasted to a loop in that the excess yarn does not protrude from the surface of the fabric.

light coating, *n*—for coated inflatable restraint fabrics, a localized amorphous area of fabric in which the coating layer is visibly at a lower rate of coverage than the surrounding material.

light coating streak, *n*—for coated inflatable restraint fabrics, a narrow area of light coating, generally in the shape of a line oriented in the warp direction of the fabric.

long float, *n*—for inflatable restraints fabrics, a small change in the weave pattern where a warp or filling yarn extends over six or more filling or warp yarns with which it should be interlaced.

loop, *n*—for inflatable restraint fabrics, a continuous yarn that curls back on itself and protrudes from the surface of the fabric. (Syn. *kink*, *snag*.)

major imperfection, *n*— in fabric grading, a deviation in a roll of fabric that judgment and experience indicate is likely to have an adverse affect on subsequent use or processing of the fabric.

DISCUSSION—Examples of major imperfections are a yarn loop that could become snagged upon deployment of the cushion and a fabric stain that could affect the physical properties of the material.

marking ink, *n*— for inflatable restraint fabrics, pigment in the shape of characters or patterns intentionally applied on fabric for the purpose of identification.

maximum inflation pressure, *n*—for inflatable restraints, the maximum internal cushion pressure occurring after breakout pressure.

minor imperfection, *n*— in fabric grading, a deviation in a roll of fabric that judgment and experience indicate is likely to have no bearing on subsequent use or processing of the fabric.

DISCUSSION—Examples of minor imperfections are a seam mark and a stop/start mark.

missing coating, *n*— for coated inflatable restraint fabrics, portions of the coated layer containing exposed base fabric or scrape marks in the coated layer.

missing yarn, *n*— for inflatable restraint fabrics, a yarn discontinuity resulting in a change in weave pattern.

misweave, *n*—for inflatable restraint fabrics, a change in the weave pattern caused by incorrect interlacing or insertion of a yarn. (Includes *mispick*, *wrong*, *draw*, *jerk-in*.)

module, *n*—for inflatable restraints, an assembly composed of an inflator, cushion, mounting device, trigger, and cover.

one-piece woven, *adj*— for inflatable restraints, a descriptive related to either 1) a tubulary woven fabric composed of two-layer inflatable sections, visible lines where the two layers initially interlace, and non-inflatable woven sections, or 2) the cushion cut from such fabric.

DISCUSSION—Under certain designs, a weaving machine is capable of simultaneously weaving two separate layers of fabric, one over the other, with tight interlacings selectively woven between them. Where the layers are not interlaced, the fabric is capable of being inflated; where they are interlaced, inflation is not possible. Although the pattern in the fabric described by the visible line where the two inflatable layers interlace may be a complex shape other than a tube, the construction is commonly referred to as tubularly woven. such weaving methods are sometimes used to minimize sewn seams in the manufacture of inflatable restraint cushions.

packability, *n*—for inflatable restraints, the compressibility of a folded airbag cushion relative to the space available in an airbag module.

rework, *n*—for inflatable restraints, the deviation from normal process flow remedially altering finished fabric, coated fabric, or cut pieces for the purpose of minimizing or removing a major imperfection.

sealed and sewn seam, *n*—in inflatable restraint cushions, a seam formed by applying a layer of seam sealant between two layers of substrate prior to a seam being sewn.

DISCUSSION—This is done to prevent the leakage of gas at the seam interface.

seam efficiency, *n*— in inflatable restraints, the ratio of seam strength to fabric strength.

seam failure, *n*— in inflatable restraints, the point at which an external force ruptures a seam assembly or the fabric, or causes excessive yarn slippage adjacent to the seam assembly.

seam sealant, *n*—in sewn and sealed seams used for inflatable restraint cushions, a liquid material applied between two layers of substrate and allowed to cure to at least a semi-solid state prior to a seam being sewn through the combination of the seam sealant sandwiched between the two layers of substrate.

seam slippage, *n*— in sewn fabrics, the displacement of fabric yarn parallel and adjacent to the stitch line.

seam strength, *n*— in inflatable restraints, the maximum force required to create a seam failure.

sharp crease, *n*— for inflatable restraint fabrics, a sharp ridge that can be felt easily, caused by a hard folding of the fabric over itself not by design.

short float, *n*— for inflatable restraints fabrics, a warp or filling yarn extending over five or fewer filling or warp yarns with which it should be interlaced.

short knot, *n*—for inflatable restraints fabrics, a small knob of yarn and associated tails where two yarns are tied together by interlocking loops for the purpose of maintaining yarn continuity.

sizing, *n*—for inflatable restraints fabrics, , a generic term for compounds which, when applied to yarn or fabric, form a more or less continuous solid film around the yarn and individual fibers.

soft contamination, *n*— for coated inflatable restraint fabrics, the presence of non-coating material within or on the coating layer, such material visibly appearing to be of small size, smooth in surface texture, and of a thickness that does not protrude significantly above the surface of the coating layer.

DISCUSSION—Examples are dirt smudge, lint, human hair, yarn filaments, and flies and similarly small insects.

DISCUSSION—Side lighting of fabric during fabric inspection may be used to determine how significantly contamination protrudes from the surface of the fabric.

specific packability, *n*— for inflatable restraints, volumetric index of compressibility for a folded fabric specimen measured at specified levels of compression.

spit mark, *n*—for coated inflatable restraint fabrics, an essentially round spot of coating material on the surface of the coated layer.