



Punkin Futz
Lisa Radcliffe
243 Waverly Avenue
Brooklyn, NY 11205

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Page 1 of 8

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Design Evaluation Report Punkin Pak



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Product Description

The product consists of multiple different items that make up the “Punkin Pak”, including a compression vest, attachable bag (2 designs being considered), and a cape and/or wings.

- **Compression Vest**
 - Fabric material is “breathable”. External soft loop allows for fully customized fit and the application of infinite attachments. The vest is intended to provide comfort to children with a variety of sensory issues, including anxiety and ADHD. Vest will have pockets in the front and at the back wait to accommodate therapeutic weights (not included). In addition, a D-ring will be provided on the center back, for parents wishing to secure the vest to a tether (not included). The compression vest will include highly reflective 3M detailing for safety.
 - Compression vest will be secured at the shoulders, sides and in front with 2” wide hook for fully customizable fit/adjustable snugness. Vest is intended to sit with the base upon the top of the child’s hips. The placement will be adjustable at the shoulders. Two sizes planned: small (4-6) and medium (8-10).
- **Attachable Bags**
 - Neon colors with reflective heat-applied “face” for safety. Intended to be waterproof and to accommodate a juice box and small snack at a maximum. Intended to carry objects such as snacks, an inhaler, metrocard/bus pass/ID, fidget, or small comfort object, etc. Bags attach anywhere on the compression vest by their hook back. Also, a covering loop flap will allow bags to secure by wrapping around the straps of a regular backpack. These bags will also feature D-rings both inside and out for securing objects such as fidgets, oral stimulation toys or keys carried by the child.
 - Interior of bag will be lined with anti-microbial PUL to discourage bacteria from growing, given the contents may go in a child’s mouth (such as fidgets or food).
 - Two bags have been proposed: one with zippers on both side of the round body of the bag for use by either the left or right hand (larger, water resistant YKK zippers to be used). The other bag has a fold over top to be secured by magnets. By offering two different types of closures, we hope to accommodate children with a broad range of motor skills, while also being cognizant of the fact that magnets cannot be used near certain medical devices. This will be clearly noted on product warning labels.
 - Nearly the entire back of bags will be covered with hook to allow bag to be attached anywhere on vest (back, front, hip, side, etc.). For children choosing to use the bag separate from our vest, there will be a loop cover with extending flaps of corresponding hook and loop to both cover the rough hook backing and to attach to the bag around handlebars, arms, backpack straps or walkers.
 - The cover flap as a separate piece will allow bag to be secured to other things, such as a backpack strap, child’s arm, walker structure or bike handlebars. Flap will have loop to cover bag’s hook back entirely and then wrap hook and loop closures around external objects.

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- **Cape**
 - Cape will attach to back shoulder area of vest (loop exterior of vest makes this very customizable to the child). Vertical hook on cape is intended to make tear-away easy to avoid any strangulation risk on swings or slides for child's play. Cape may have reflective edging or heat-applied reflective design for added safety. This has not yet been fully designed.
- **Wings**
 - A flexible wire structure is planned, that will be entirely covered by a gauze fabric (similar products currently exist on the market and may be leveraged). Wings will attach at the back shoulder area of vest (loop exterior of vest makes this very customizable per child). Vertical hook on wings is intended to make tear-away easy to avoid any entanglement risk during child's play. Wings may have reflective edging or heat-applied design for additional safety. This has not yet been fully designed.

Age Determination/Appropriateness

The Consumer Product Safety Commission's Age Determination Guidelines would likely place the Punkin Pak items under review in the category of "Dress-Up Materials". When determining the age appropriateness of dress-up materials, emphasis should be placed on the level of realism/detail, licensing, materials, and motor skills required.

Around 19 to 23 months of age, the appeal of dress-up materials starts to increase along with the child's increase in fine-motor dexterity and control, such as the use of a pincer grasp between thumb and forefinger. They become more skillful at undoing hook-and-loop, Velcro®, or touch fasteners, though they still have some difficulty re-matching these types of fasteners.

Children under two years of age are attracted to a variety of basic dress-up materials such as shoes, hats, headscarves, other hair accessories, clip-on ties, bracelets, and necklaces. They prefer a simple level of detail such as basic shapes and bright colors. They continue putting necklaces and other items around their neck, so toys and costumes of this kind must not present a strangulation hazard. Children in this age group enjoy wearing costumes or accessories that remind them of characters from television programs or videos.

At two years of age, children start to pretend-play more often and in more complex ways, preferring dress-up materials that have a low degree of realistic detail. They are learning to appreciate and enjoy the symbolic transformations that dress-up materials provide. As they grow closer to three years of age, they can easily become the character that their costume suggests, acting out the typical behaviors and expressions of characters and pets (i.e. running around or pretending to fly if they are wearing a cape), especially those from television and other media. They are developing greater dexterity, and around 30 months of age they become more adept at matching hook-and loop, Velcro®, or touch fasteners, and using large buttons, buckles, or hooks as on frames and cubes. They enjoy independently putting on simple costumes.

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Three-year-olds look forward to pretending with costumes and accessories that have moderately realistic detail in either all types of colors. Due to increased dexterity, fine motor control, and problem-solving abilities, these children are better able to put on and take off costumes and accessories. They enjoy costumes and dress-up materials with themes such as superheroes, doctor, police, and fire-fighting. With some degree of success, these children can work with simple snaps and with relatively large buttons, hooks, lacing, and buckles. Three year-old children have a basic understanding of the dynamics of good and evil, and begin to enjoy games like cops and robbers.

Children four and five years of age develop greater sophistication in their pretend play and more often enact extended stories. They enjoy more elaborate, detailed costumes (i.e. superheroes and professions) that increase their opportunities for independently developing and encompassing more complex dramas and fantasies. Adult coaching helps these children to extend their pretend play. Their dexterity and fine-motor skills are moderately developed to the point where they can better handle typical adult-size snaps, buttons, buckles, hooks, and lacing challenges. The dress-up materials that interest them to the greatest degree are based on themes from various experiences and media (television, videos, computer games, movies, and books), including doctor, house/family, school, police, military, fire fighters, dinosaurs, pets, and spaceships.

The surrounding media culture, the immediate community, their school, peers, and experiences have a significant impact on school-age children six through eight years of age. These play a larger role in the fantasy themes and dress-up materials that appeal to their interests and impact their choices. Children in this age range display a deeper interest in themes that promote chase games (i.e. cops and robbers, the military), rough and tumble play (i.e. wrestling and king-of-the-mountain), movie reenactments, and comic book characters. Appealing costumes are more realistic looking in size, detail, and function. Toward the end of this age range, children prefer semi-structured group drama performances or staged plays. Typical themes include major historical events, fairy tales, adventures in space and elsewhere, cops and robbers, battles of all kinds, ballet, circus, school, house and fire fighter, all involving various accessories including capes and fairy wings.

Since the Punkin Pak items under review are expected to be utilized by children with various levels of motor skill impairments, as well as those with sensory, ADHD, and/or anxiety issues, it can be assumed that these children may not behave within the 'norms' of their chronological age. We know that children under three years of age greatly enjoy placing all types of objects into their mouth, but children with various impairments may continue this behavior far longer than a child without impairments. In addition, a child without disabilities may be able to dress themselves at four or five years of age, while a child with disabilities may always need a little help with buttons, clips, hooks, Velcro® closures, zippers, etc.

The simpler the fasteners and closures for the compression vest and attachable bags are, then more children of various ages and abilities will be able to utilize the Punkin Pak items. Based on the intended sizes of the vest (small and medium) and the interest and capabilities of young children, it appears that the vest should be appropriate for children 3 to 10 years of age. Children

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in this age range with mild impairments will likely be able to put the vest on by themselves (likely after being shown how), as well as attach the bag(s) to their vest. Children with moderate to severe impairments will likely have a parent or caregiver who will be able to assist the child with the vest and bags. Children of all ages and abilities can be expected to need assistance adding the cape or wings to their vest.

Key Safety Issues/Concerns and Recommendations

Regulatory Requirements

- The compression vest, attachable bags, cape, and wings must meet the federal safety requirements for flammability in textiles, as defined in 16 CFR 1610.
- In clothing and textiles, metal components (i.e. buttons, snaps, and zippers), plastic, paints, screen printing inks, and pigments are subjected to the CPSIA Section 101 Lead in Substrates requirement of no more than 100ppm maximum.
- All metal components must pass Sharp Edge testing, while all other materials must pass Sharp Point testing, as defined in 16 CFR 1500.

Additional UL Human Factors Concerns / Recommendations:

- It is recommended that the Punkin Pak items not contain the phthalates DEHP, DBP, BBP, DINP, DIDP, DnOP, or DNHP, in concentrations exceeding 0.1 percent.
- It is probable that different parts of the Punkin Pak will be mouthed by children, so it is recommended that the items included in the Punkin Pak do not create small parts under reasonably foreseeable use or misuse.
- All edges and surfaces of the plastic components should be well rounded and radiused to reduce the potential for laceration injuries.
- Ensure that the skin of small fingers cannot be pinched when any types of closures are utilized.
- Cleaning instructions for all items included in the Punkin Pak should be clear and easily located.
- The compression vest, attachable bags, and cape should all be comprised of a colorfast material, as mouthing of these items is very likely to occur.
- The attachable cape and wings should contain a break-away or tear-away mechanism that requires less than 5 lbs. of force to detach from the vest to minimize the risk of strangulation.
- Magnets in attachable bag must be completely inaccessible in order to avoid ingestion or choking hazards.
- Any item containing magnets should be clearly labeled to avoid any interaction with medical devices.

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Recalls and Injuries associated with similar products

Recalls associated with capes, wings, and vests:

A search of the CPSC and Health Canada recall websites was conducted. Results below:

Recall Organization	Search Timeframe	Date	Item	Country	Details
CPSC	Jan 2006 to March 2016	4/7/2016	IKEA Recalls Children's Bat Cape Costumes Due to Strangulation Hazard	US Canada	The fabric hook and loop fastener at the neck of the bat cape can fail to detach readily during use, posing a strangulation hazard to children.
		10/29/2010	Girls' Ruffle Vests Recalled by The Children's Place Due to Choking Hazard	US	Metal snaps can detach from garment causing a choking hazard.
		12/30/2008	Boys Reversible Vests Recalled by Bon-Ton Stores Due to Choking Hazard	US	The zipper tabs on these vests fail to meet the children's torques test standards, posing a choking hazard to children.
		10/31/2006	Family Dollar Recalls "Creepy Cape" Costumes Due to Flammability Hazard	US	These vinyl capes fail to meet the standard for the flammability of vinyl plastic film, posing fire and burn hazards to consumers.
		9/30/2015 10/17/2014	Spirit Halloween recalls feather boas and feather angel wings	Canada	Health Canada's sampling and evaluation program has determined that the feather boas and large feather angel wings do not meet the requirements for textile flammability under the Canada Consumer Product Safety Act.
Health Canada	Jan 2006 to March 2016	10/30/2014	Expanded Recall: Fun World recalls Fun World Fantasy Feather Wings	Canada	Health Canada's sampling and evaluation program determined that the feathered wings of the "Fun World Fantasy Feather Wings" adult costume accessories do not meet the requirements for textile flammability under Canadian law.
		10/18/2012	Spirit "Feather Angel Wings"	Canada	Health Canada's sampling and testing program revealed that the some components of the Spirit brand Feather Angel Wings do not meet the requirements for textile flammability under Canadian law.
		10/19/2009	Halloween Costume Capelet with Marabou Trim	Canada	Health Canada's sampling and evaluation program has revealed that the marabou trim on the Halloween costume does not meet the requirements for textile flammability under Canadian law.

Incidents associated with capes, wings, and vests:

An online search of the NEISS (National Electronic Injury Surveillance System) database was conducted through the Consumer Product Safety Commission's website. Incidents summarized below include the years 2011 through 2015 for children 14 years and younger and involved the NEISS codes 1342 Costumes or Masks and 1645 Day Wear. Based on these parameters, only a few injuries were found:

Search Timeframe	Age	Product Code(s)	Code Description	Keyword(s)	Incident Details	Injury
2011 to 2015	1 Month to 14 Years	1342	Costumes or Masks	Cape, Wing, Vest	2 year-old female scraped knee on fabric wing from costume	Knee Abrasion
					4 year-old male tripped on cape and fell to floor	Chin Laceration
					3 year-old female slipped on cape and fell	Facial Laceration
					3 year-old male tripped on cape, fell, hit head on coffee table	Scalp Laceration
					5 year-old male running and tripped on cape, twisting foot	Foot Sprain
					4 year-old female tripped on cape and fell	Lip laceration
2011 to 2015	1 Month to 14 Years	1645	Day Wear	Vest, Cape	8 year-old male running with cape on, got tangled and fell	Chin Laceration
					14 year-old female got finger caught in vest	Finger Dislocation
					22 month-old female not moving arm after mom took vest off	Nursemaid's Elbow

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Design Evaluation

This Design Evaluation includes human factors concerns of potential hazards that may not be identified by regulatory (country specific) testing requirements. Below information is based on submitted photos provided and shown on page one of this report. Changes made to these designs or additional information provided may result in revised report.

Gauges	Comments	Agency must address: Yes/No
Small Parts Fixture	Items included in the Punkin Pak should not create small parts under reasonably foreseeable use or misuse.	
1.75" Ball gauge	NA	
1.68" Supplemental Fixture	NA	
1.96" x 1.37" Rattle Fixture	NA	
Other Potential Safety Issues		
Sharp Points	NA	
Sharp Edges	NA	
Strangulation	Break-away or tear-away mechanism < 5 lbs. of force for cape and wings	Agency has stated that this potential hazard will be addressed.
Suffocation	NA	
Finger Entrapment	NA	
Entrapment, Other (i.e. hand, head, leg)	NA	
Ear Impaction	NA	
Laceration / Projection	All edges and surfaces of the plastic components should be well rounded and radiused to reduce the potential for laceration injuries.	
Pinching	Ensure that the skin of small fingers cannot be pinched when any types of closures are utilized.	
Projectile	NA	
Sound Level	NA	
Light Intensity	NA	
Aspiration	NA	

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Prepared by

Melissa Beran
Sr. Human Factors Specialist

Resources:

1. ISO Guide 50: Safety Aspects – Guidelines for child safety
2. EN71-1:2011: Safety of Toys
3. ISO 8124 -1: Safety of Toys
4. EN Directive 2009/48/EC: Toy Safety
5. ASTM F963 – 11: Toy Safety
6. Age Determination Guidelines: 2002
7. Canada’s Hazardous Products (Toys) Regulation CCPSA
8. Industry Guide to Canadian Safety Requirements for Children’s Toys and Related Products: 2006
9. The Code of Federal Regulations – 16 CFR 1500

***** End of Report *****

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