COMPARISON OF US and EUROPEAN HIGH VISIBILITY WORKWEAR STANDARDS

CHARACTERISTIC	ANSI/ISEA 107-1999	EN 471
Approval Date	06/01/1999	03/21/1994
Garment certification	"Self-certification" of garments using certified components	EEC 89-686 requires third party certification of all PPE's, including garments
Design	Flexible;requires contiguous areas of retroreflective material encircling torso (and legs). Suggests designs.	More rigid; additional specific requirements, compatible with ANSI/ISEA 107-1999 suggestions
- design examples	Appendix B2	Annex B - same except minimum distance between trim bands always 50mm
- Conspicuity Class guidelines	Appendix B1	None
-minimum retroreflective trim width	Class 1: 25mm Class 2: 35mm Class 3: 50mm	All classes: 50mm
- minimum retroreflective trim area	Class 1: 0.1sqm Class 2: 0.13sqm Class 3: 0.2sqm	Same as ANSI/ISEA 107-1999
- minimum combined performance trim width	Class 1: 50mm	Same as ANSI/ISEA 107-1999
- minimum combined performance trim area	Class 1: 0.2sqm	Same as ANSI/ISEA 107-1999
- minimum background fabric area	Class 1: 0.14sqm Class 2: 0.5sqm Class 3: 0.8sqm	Same as ANSI/ISEA 107-1999

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Design (Continued)		
- minimum spacing between trim bands	Equal to trim width	50mm
- minimum distance trim from edge	50mm	Same as ANSI/ISEA 107-1999
- gaps to fasten (all materials)	50mm max	Same as ANSI/ISEA 107-1999
- trousers	Class E: ensemble accessory; background min. 0.3sqm, retro min. 0.07sqm; used with Class 2 garment = Class 3	No Class E
- harness	Min. 50mm wide retro trim; encircle waist, go over shoulders.	Minimum 30mm wide retroreflective trim; same design
- garment sizes	No requirements	EN 340
Initial photometric performance (5^o/12')		
- retroreflective material	Level 2: 330 Level 1: 250	Same as ANSI/ISEA 107-1999, but Class 2 = Level 2 Class 1 = Level 1
- combined performance material	Level 2: 330 Level 1: 250	65 (no class/level)
- test method	ASTM E808 & E809	CIE 54:1982
Photometric Performance after exposure to:	minimum 100	Same as ANSI/ISEA 107-1999, except combined performance material = 30minimum
-abrasion	EN530, Method 2; 5000 cycles, 9kPa wt.	Same as ANSI/ISEA 107-1999
- flexing	ISO 7854, Method A; 7500 cycles	Same as ANSI/ISEA 107-1999
- folding	ISO 4675; -20C	Same as ANSI/ISEA 107-1999

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Initial photometric performance (5^o/12') (Continued)		
- temperature cycle	12 hours@ 50C/20 hours @ -30C	Same as ANSI/ISEA 107-1999
- wash according to care label	ISO 6330, Method 2A; 5 cycles or as stated on label	Same as ANSI/ISEA 107-1999
- dry-clean according to care label	ISO 3175, section 9.1; as stated on label	Same as ANSI/ISEA 107-1999
- during rainfall	Appendix A	Annex A (similar), except combined performance material = 15 minimum
Initial color-background & combined performance		
- chromaticity	Defined color box coordinates	Same as ANSI/ISEA 107-1999
- luminance	Defined minimum luminance factors	Same as ANSI/ISEA 107-1999
- test method	ASTM E1164, D65 illumination, etc.	CIE 15.2 (similar)
Colorfastness (background & combined performance) after exposure to:		
-xenon light	Meet original color/luminance requirements	Same as ANSI/ISEA 107-1999
- test:combined	ISO 105-B02, Method 1	Same as ANSI/ISEA 107-1999
- test: background	AATCC 16	ISO 105-B02, Method 1
Colorfastness of background material after exposure to:	Meet stated AATCC color change/staining requirements	Same terminology as ANSI/ISEA 107-1999, but uses ISO references

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- rubbing test, wet/dry	AATCC 8	ISO 105-X12
- perspiration resistance	AATCC 15	ISO 105-E04
- home & commercial laundry	AATCC 61	ISO 105-C06& C2S
- dry-cleaning	AATCC 132	ISO 105-D01
- hypochlorite bleach	AATCC 61	ISO 105-N01
- hot pressing	AATCC 133	ISO 105-X11
- water	AATCC 107	None
Mechanical properties of background fabrics		
- dimensional change	Not to exceed +/-4% length, +/- 2% width; 5 cycles AATCC 135 or AATCC 96, wash only	Not to exceed +/- 3% both directions; 5 cycles EN340, 5.4, wash or dry-clean
- tensile	ASTM D5034; min. 445N length & cross	ISO 5081; minimum 850N length, 650N cross
- burst (knit fabric)	ASTM D3787; minimum 378kN/sqm	ISO 2960; minimum 1000 kN/sqm
- tear resistance (coated fabric)	ASTM D1424; minimum 13N	prEN 343, sections 4.4 & 4.5
- water resistance (if required)	AATCC 35 max 1g & AATCC 127, min 200 cm, original & after 5 launderings	prEN 343
- water repellency (if required)	AATCC 22; 90 original, 70 after 5 launderings	None
- water vapor permeability (if required)	ASTM E96, Method B: 600 minimum; Method BW 3600 minimum	prEN 343, section 4.2

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Garment ergonomics	Should not adversely affect wearer	prEN 340, section 4
Garment markings	* on product or label attached to product	Same as ANSI/ISEA 107-1999
	*affixed so visible/legible	Same as ANSI/ISEA 107-1999
	*durable for appropriate number of cleanings	Same as ANSI/ISEA 107-1999
	*large enough for immediate understanding	Same as ANSI/ISEA 107-1999
	*name of manufacturer, product type, size, description	Same as ANSI/ISEA 107-1999
	*ANSI standard number, pictogram with level	Same except use EN standard number
Instructions for use	Fit, misuse, storage, cleaning, limitations, etc.	Same as ANSI/ISEA 107-1999

Notes:

Year of test method approval omitted for brevity

These are guidelines only. Different test methods used in the two standards should not be assumed to be exactly the same. Please read each test in case of questions.

3M

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