Are your protective eyewear products ready for the 11 November 2025 transition?

Understand what EN ISO 16321 means for your products – and how to stay compliant.

A BSI webinar

16th September 2025

Hello and welcome

- From 11 November 2025, EN 166:2001 will no longer provide presumption of conformity. All new products must comply with EN ISO 16321-1:2022+A1:2025.
- In this webinar, we will explore:
  - Key differences between EN 166 and EN ISO 16321
  - Transition timelines and certification pathways
  - Testing, CE/UKCA marking, and BSI Kitemark options
  - Implications for spectacles, goggles, face shields, prescription PPE and more
  - New standard development - how BS 30417:2023 supports inclusive PPE design and compliance
- Q+A at the end of the webinar – please add your questions to the chat
- You will get a copy of slides and a recording of the webinar
- Opportunity to ask for a follow up from BSI on the feedback form – available immediately after the webinar concludes.

Meet our speakers

Nathan Shipley

Certification Technical Manager

Expert in PPE testing and certification, supporting manufacturers in navigating CE/UKCA requirements and Kitemark approvals.

Sara Gibbs

Standards Development Manager

Specialist in European and international standards, with a focus on inclusion and how standards like BS 30417 support diverse workforce needs.

Safe and inclusive PPE

It’s kind of a big deal

How many questions can you get right?

Answer the public – question 1

According to a CSA Group survey of nearly 3,000 Canadian women who use PPE at work, what percentage reported not wearing all required PPE due to fit issues?

12%

28%

42%

58%

Source - https://www.csagroup.org/article/research/canadian-womens-experiences-with-personal-protective-equipment-in-the-workplace/?srsltid=AfmBOorNJD3P2eskhy6TVfY1UDHxwkOfKLgq7TAPTgTthLvOoLQ-0QQd&utm_source=chatgpt.com

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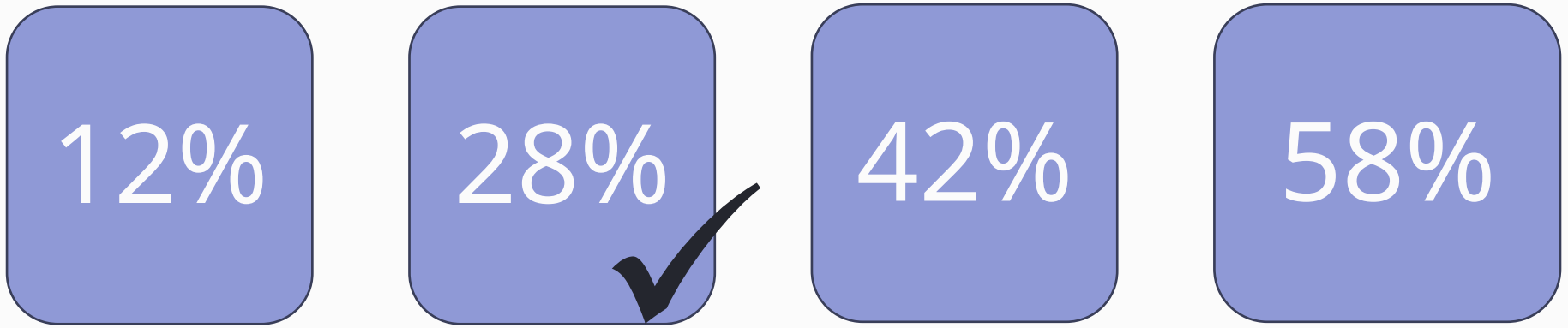

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Answer the public – question 2

According to a CSA Group survey of nearly 3,000 Canadian women who use PPE at work, what percentage reported that PPE is uncomfortable to wear?

22%

35%

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Answer the public – question 3

According to a CSA Group survey of nearly 3,000 Canadian women who use PPE at work, what percentage said that PPE selection is inadequate?

18%

27%

35%

50%

Source - https://www.csagroup.org/article/research/canadian-womens-experiences-with-personal-protective-equipment-in-the-workplace/?srsltid=AfmBOorNJD3P2eskhy6TVfY1UDHxwkOfKLgq7TAPTgTthLvOoLQ-0QQd&utm_source=chatgpt.com

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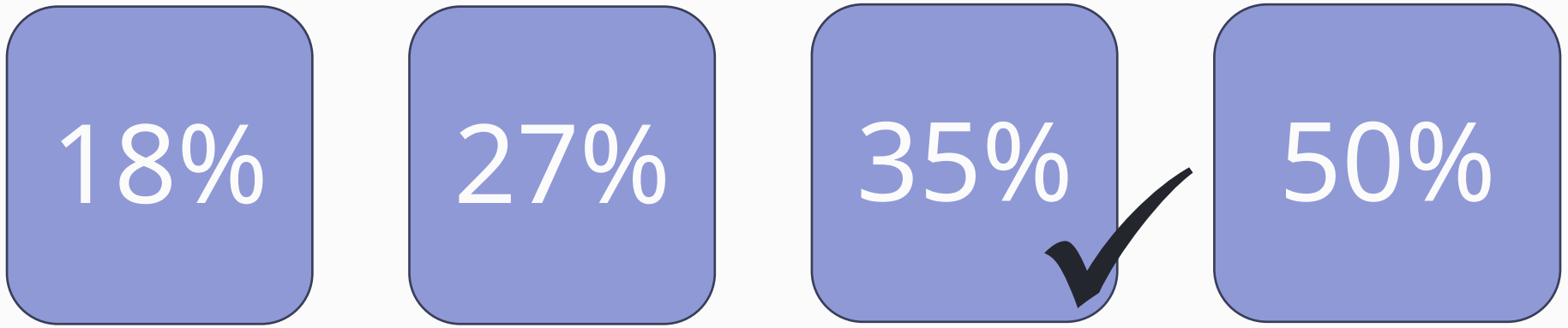

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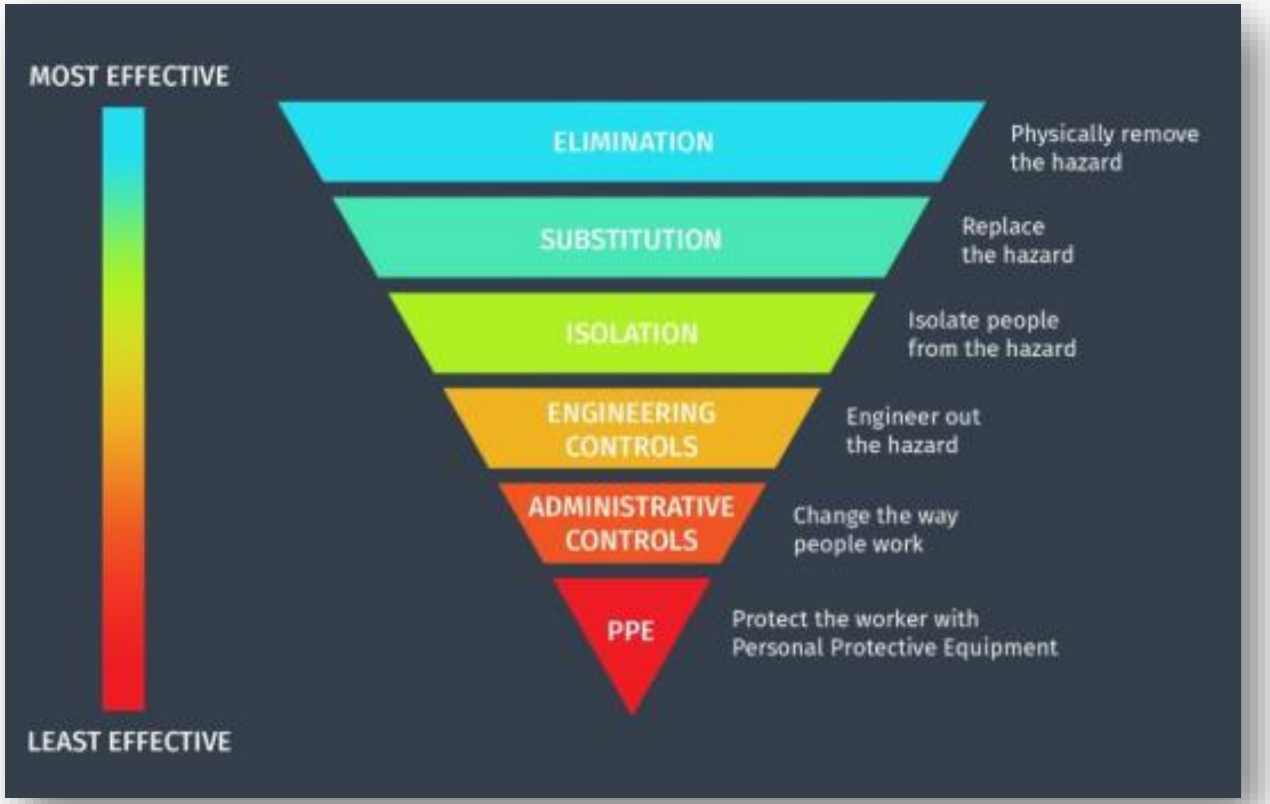
Key updates and practical application of the ISO 16321 standards

Nathan Shipley

Certification Technical Manager

Five levels of safety controls



- **Hierarchy of controls**
- Elimination – physically remove the hazard.
- Substitution – replace the hazard.
- Engineering controls – isolate people from the hazard.
- Administrative controls – change the way people work.
- PPE – protect the worker with equipment

Impact of Diversity

Impact for a fair society and a sustainable world

The report, *Canadian Women's Experiences with Personal Protective Equipment in the Workplace*, includes insight from almost 3,000 women who use PPE at work. According to the findings, **more than 80%** experience one or more problems with their PPE, and:

50%
have experienced improper fit

58%
use PPE that is the wrong size at least some of the time

43%
feel PPE is uncomfortable to wear

28%
do not wear all the required PPE at work because of issues with fit

35%
say the PPE selection is inadequate

38%
use a workaround to make their PPE fit

The research also found that **40%** of the women surveyed had experienced injuries and incidents related to PPE.

Although PPE is considered to be the last line of defence, it could and should be seen by employers as a key method for protecting the workforce. As such, **it is critical that all workers have PPE that fits**.

PPE Standards are changing

Impact for a fair society and a sustainable world

Evolution of eyewear standards

EN 166 Safety eyewear		EN ISO 16321-1:2022
EN 175 Welding screens		EN ISO 16321-2:2022
EN 1731 Mesh visors		EN ISO 16321-3:2022

ISO’s getting harmonization for CE 11 November 2025

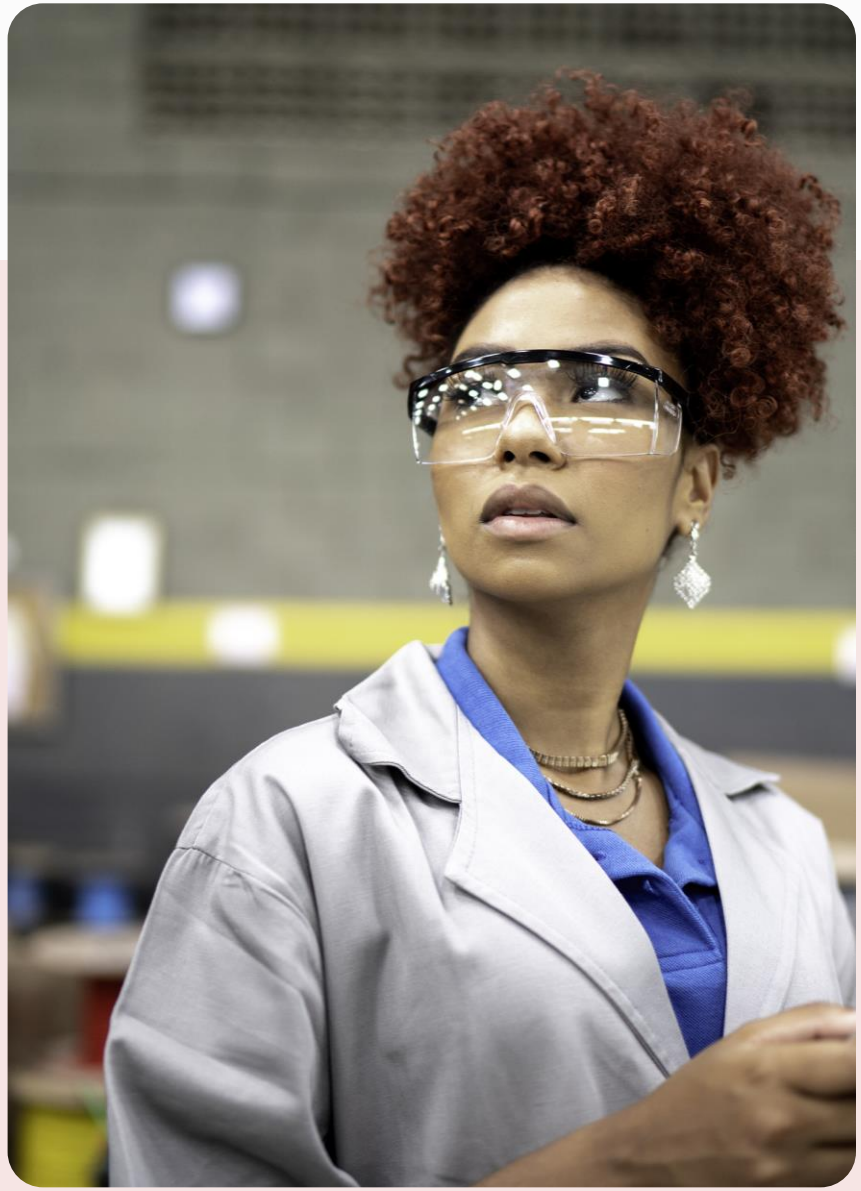
The ISO 16321 suite of standards

EN ISO 16321-1:2022 Eye and face protection for occupation use – Part 1 General requirements

EN ISO 16321-2:2021 Eye and face protection for occupational use – Part 2 : Additional requirements for protectors used during welding and related techniques

EN ISO 16321-3:2022 Eye and face protection for occupational use – Part 3 Additional requirements for mesh protectors

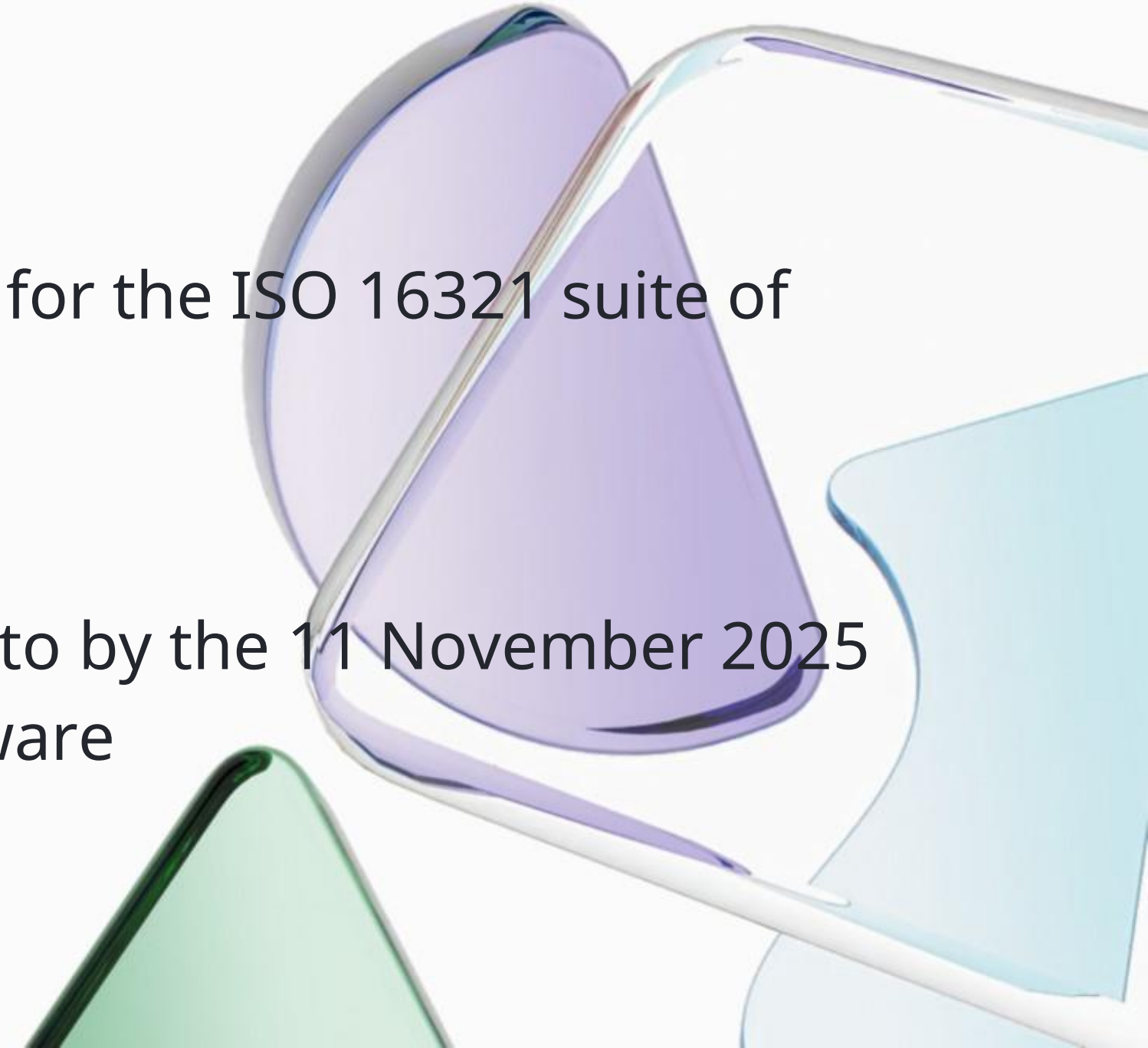
ISO/DIS 16321-4 Eye and face protection for occupational use: Part 4 of the new suite of standards is still in development and has not been published yet. This part will cover the additional requirements for protection against biological hazards.



Poll 1

How prepared are you for the ISO 16321 suite of standards?

a) Already compliant
b) We are not but plan to by the 11 November 2025
c) Not ready yet but aware
d) Not ready at all



EN 166

- EN 166:2001 Personal Eye Protection
- Two headform sizes:
  - Small
  - Medium
- Shape of the head is the same (very Caucasian) only size changes
- Majority of manufactures only make product to fit a medium head

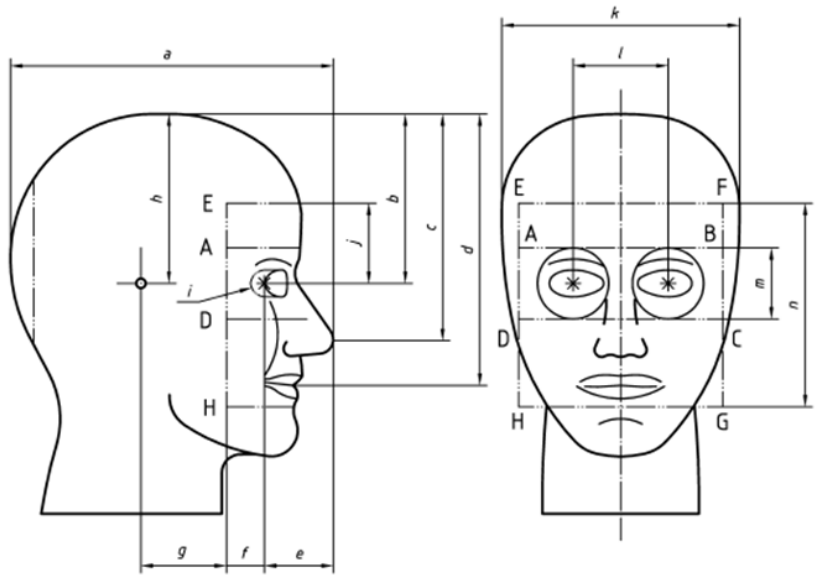
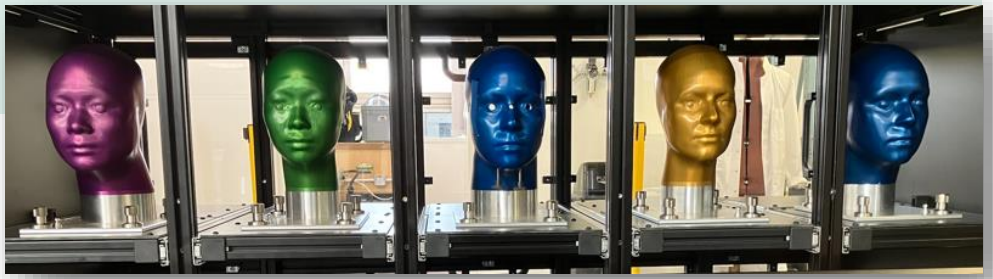


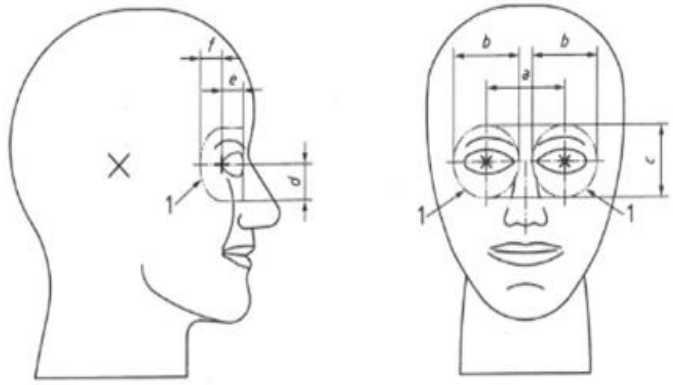
Figure 11 — Reference head-form

Dimension	Value mm	
	Medium size head	Small size head
a	218	206
b	111	110
c	144	131
d	178	166
e	45	42
f	18	18
g	60	53
h	111	110
Radius i	10	10
j	56	48
k	156	146
l	84	54
m	52	48
n	134	118

EN 166

- ISO 16321-1:2021 - Eye and face protection for occupational use
- Uses 6 head forms
- Refers to ISO 18526-4 and the surveying of the head dimensions was based on[(1)];
  - Three age ranges
  - Two genders
  - Four ethnicities:
    - ✓ White, African,
    - ✓ American
    - ✓ Hispanic
    - ✓ Others





Key

1 extended orbital protection zones

∗ corneal apices and pupil centres

+ lateral canthus

╳ resting point of the sides

a–f As defined in Table 13.

NOTE This protection can be given by cup goggles with individual lenses for each eye; the whole width of the face can be protected by a box goggle with a one-piece lens covering both eyes.

Figure 3 — Extended orbital protection zone (EOZ) — Minimum area to be protected [(impact level D (80 m/s)]

Table 13 — Dimensions of extended orbital protection zone (impact level D) for individual headforms based on interpupillary distance and corneal apex position

Tolerance on dimensions ±0,5 mm

Dimensions in millimetres

Dimensions see Figure 3	Headform						
	1-C12	1-S	1-M	1-L	2-S	2-M	2-L
a[a]	58	60	64	68	63	64	70
b and *c*	41	47	52	55	43	45	51
d	21	23	26	27	21	23	26
e	8	9	12	13	7	8	9
f	10 mm around lateral canthus location				10 mm around lateral canthus location		

[a] Dimension *a* is the same as dimension *D* in ISO 18526-4:2020, Table 2 and Table 3.

NOTE There are no dimensions available for headforms 2-C12.

ISO 16321 Impact

Impact for a fair society and a sustainable world

Basic impact

All eye protectors must provide at least basic impact protection

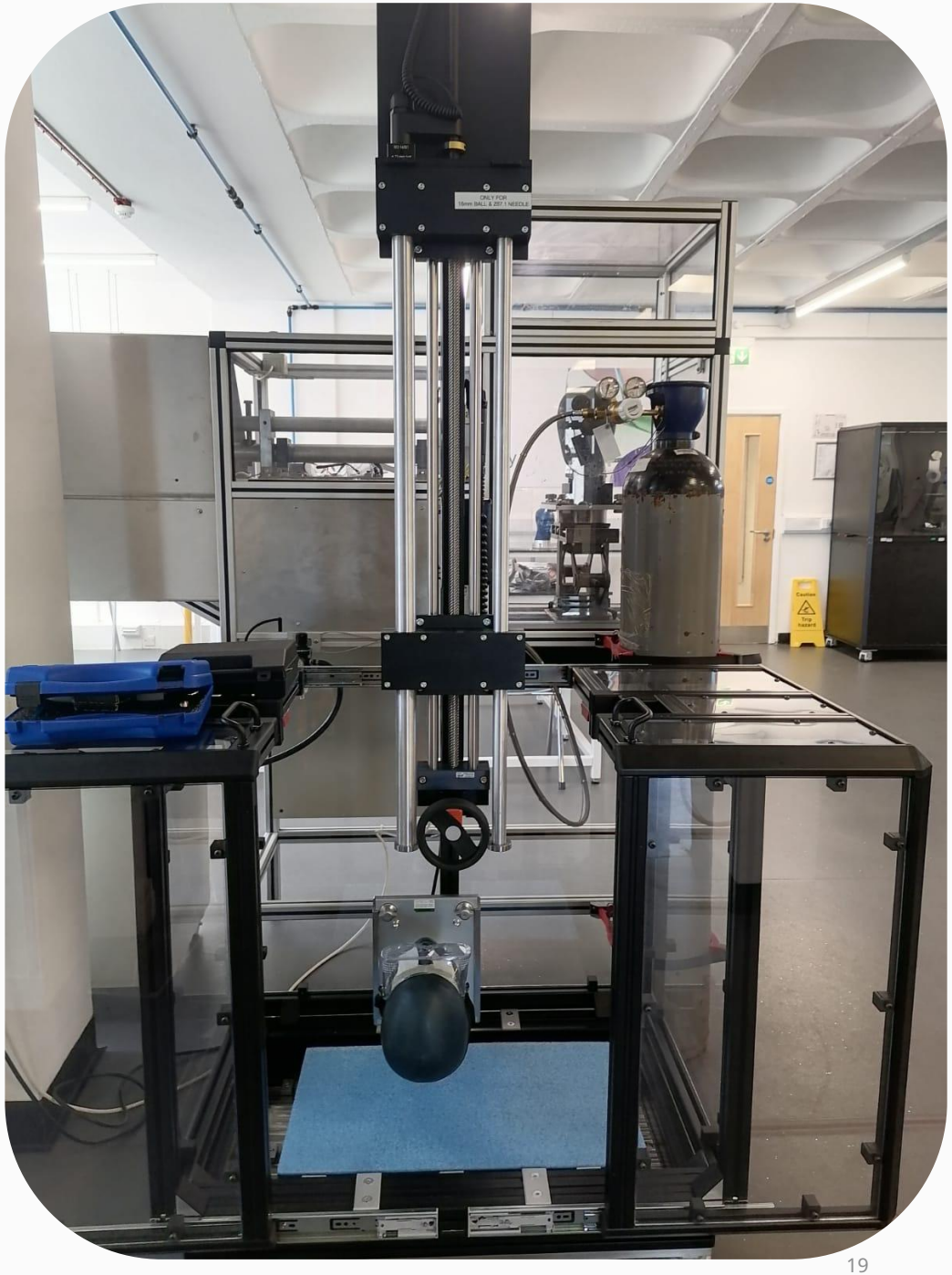
EN 166:2001 Steel Ball Measurements	EN ISO 16321-1 Steel Ball Measurements
22 mm diameter	25 mm diameter
43 grams	66 grams

High-speed impact

This test is an option.

- Change to the velocity speeds and three new impact levels C, D and E
- Minimum coverage areas called protection zones: OPZ, EOZ and FPZ

Velocity of the ball	(45+1,5%)m/s	(80+2,0%)m/s	(120+3,0%)m/s
Impact level	C	D	E
Minimum area to be protected	Orbital protection zone (OPZ)	Extended orbital protection zone (EOZ)	Face protection zone (FPZ)



ISO 16321 Impact

Impact for a fair society and a sustainable world

High Mass Impact

The high mass impact is an optional test for those eyewear devices that offer protection against high mass objects moving at a moderate speed.

The high mass impact test is conducted with two impact points, frontal left and frontal right, with a pointed steel projectile weighing 500g.

ISO 16321 – Options

“If everyone is moving forward together, success takes care of itself”. Henry Ford

There are several new optional requirements within the EN ISO 16321-1:2022 standard, some of which were not included in the old standard EN166:2001.

Optional requirements get assessed only if they are applicable to the type of protector or the special protection characteristics are claimed by the manufacturer.

Optional requirements include:

- resistance against fogging
- resistance to surface damage by fine particles
- protection against gases and fine dust particles
- protection against large dust particles
- protection against molten metals and hot solids
- high mass impact NEW
- protection against radiant heat NEW
- protection against streams of liquids NEW
- lens assessment for anti-reflective coatings NEW
- use in explosive atmospheres NEW
- chemical resistance NEW

ISO 16321 marking

The table presents and compares the new marking requirements as per EN ISO 16321-1:2022 and old EN 166:2001 standard.

Code letters EN ISO 16321-1:2022	Code letters EN 166:2001	Description
16321	EN 166	Basic use
1	1/2/3 -Optical class	Enhanced optical performance (marking optional)
3	3	Droplets
4	4	Large dust particles
5	5	Gas and fine dust particles
6	-	Streams of liquids
7	-	Radiant heat
9	9	Molten metals and hot solids
CH	-	Chemical resistance
K	K	Surface damage by fine particles
N	N	Resistance to fogging
-	S	EN 166 Increased robustness
C	F	Impact level C (45m/s)
D	-	Impact level D (80m/s)
E	B	Impact level E (120m/s)
-	A	EN 166 impact level A (190m/s)
HM	-	Impact level HM
CT	FT	Impact level C (45m/s) at extremes of temperature
DT	-	Impact level D (80m/s) at extremes of temperature
ET	BT	Impact level E (120m/s) at extremes of temperature
HMT	-	Impact level HM at extremes of temperature

More information can be found in BSI's ISO 16321 white paper:

ISO 16321-1:2022+A1:2025 – The changes

Clause	Requirement / Comments
5.1 Field of view	Field of view – protectors used for driving shall have a minimum unobstructed view in front if each eye of 60° temporally
6.3.3.2 Luminous and spectral transmittance and scale numbers	Changes in Tor values at 315-380 nm and 380-400 nm
6.3.3.3 Marking of sunglare filters	Sunglare filters marked G0, G1, G2 or G3 are suitable for driving, those marked G04 are nor
6.3.3.4.2 Polarizing filters	When tested against ISO 18526-6:2020 polarising efficiance will be ≥78% for G2, G3 and G4 filters, G1 shall be ≥60%. G0 will not have any polarising effect
6.4 Frame transmittance	Sunglare filters with scale number G4shall provide tempral shielding in accordance with ISO 12312-1:2023 cl 11.2
7.1.1 Area to be protected - General	Overview of tables 11 to 14 and clarification that the definition of lateral protection has been clarified.
7.1.2.1 Frontal protection and 7.1.2.2 Lateral protection	Frontal impact & Lateral protection - The area to be protected have been changed slightly dimensionally and been broken down in the frontal and lateral protection areas.
7.10 High speed impact resistance, impact level C, D & E	7.10.2 for a protector provided with a prescription insert behind the protector lens , when mounted with a nominal 2mm thick afocal uncoated hard resin lens it shall not be permitted for lens cracks through the entire thickness or physically separate into two or more pieces.
7.15 Protection against droplets	The protection against droplets has changed from pink or crimson coloration to blue coloration as it is using a new detecting solution which is thymol blue sodium salt
7.16 Protection against streams of liquids	Clarification on spray nozzle referring to ISO 18526-3:2020 Annex B and C
8 Marking, 8.1 general	If the lenses and frames form a single unit, the complete marking shall applied to at least one of the frame front or one of the lenses or filters.
8.2 Mandatory markings on lenses/filters	Table 19 overview of filter markings
8.4 Optional markings on lenses/filters	Addition of markings that need to appear with each claim for clarification
8.5 Optional markings on frames	Addition of markings that need to appear with each claim for clarification

Respiratory standards

The Existing European norms

The Sheffield Head –

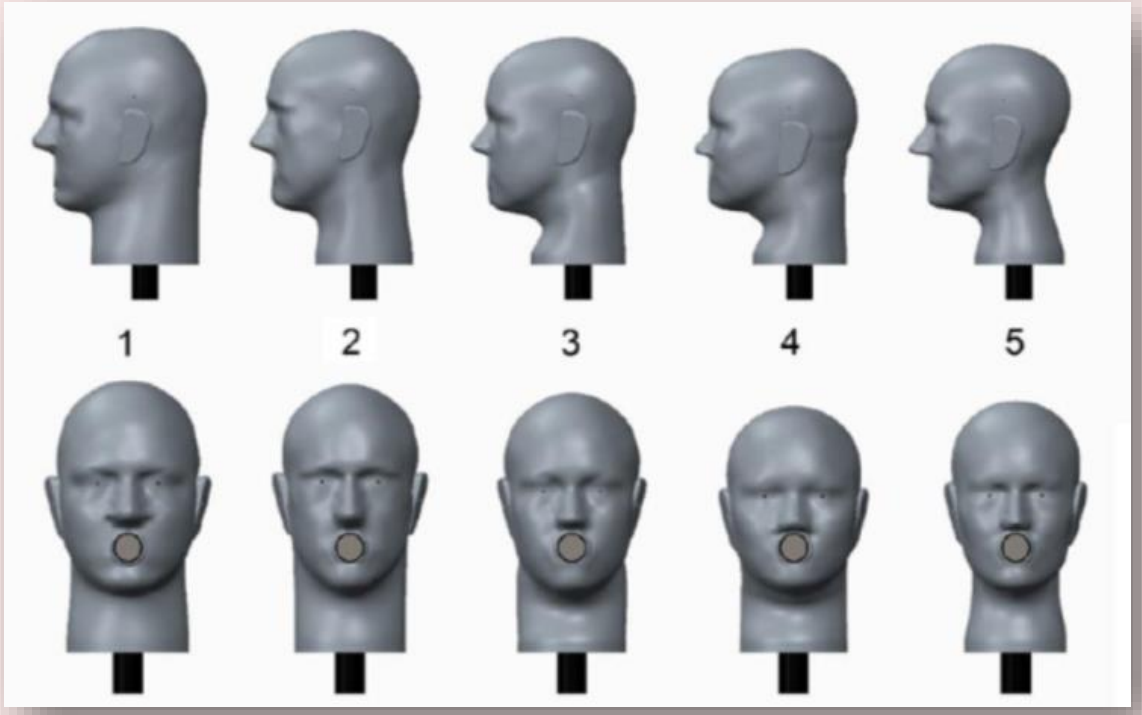
- Taken from a mould of a gentleman call Jim Bolsover (white male) based at Health and Safety Labs based in…. um Sheffield
- A volunteer was required to have a mould taken and Jim was the in the RPE section at that time and volunteered in the late 70’s
- Many wrongly think it was designed as a representative headform but it wasn’t. However, it did quickly get accepted by BSI and CEN as the standard head for testing

The ISO 17420 suite of standards

Refers to another ISO, ISO 16976-2 Human factors, Part 2: Anthropometrics)

Clause 5 Anthropometric data for head, face, and neck dimensions – Test panels for the development of an International Standard **must be** representative of the world population.

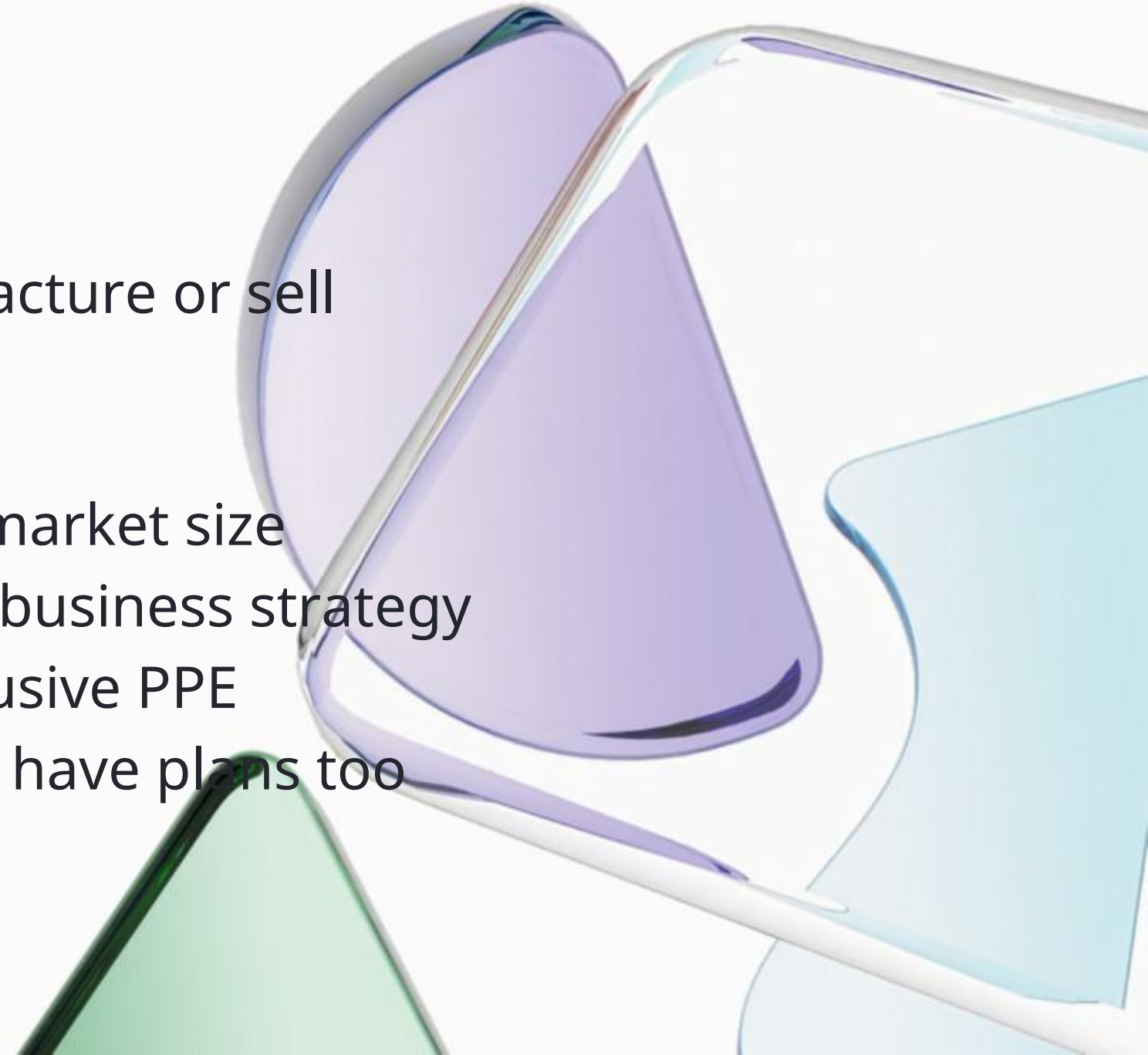
- Four racial/ethnic group strata
  - White
  - African American
  - Hispanic
  - and other
- The NIOSH data were supplemented with additional measurements in China and other data for various countries.



Poll 2

What drives you to manufacture or sell inclusive PPE?

a) It increases our target market size
b) Its part of our inclusive business strategy
c) We don’t sell/make inclusive PPE
d) We don’t at present but have plans too



Key takeaways

Timescales

- CE and UKCA EN 166 presumption of conformity removed **11 November 2025**

- EN ISO 16321:2022+A1:2025 has been published and likely to be in the Official Journal by the end of the year

- Also ISO 17420 adopted by Australia in 2030 – Where next?

Are your protective eyewear products ready for the 11 November 2025 transition?

Inclusive PPE Provision & BS 30417

Sara Gibbs,
Standards Development Manager
2025-09-16

Version 1.0.0

Why Inclusive PPE?

The Scale of the Challenge

- 12,000 lung disease deaths and nearly 400,000 cases of other work-related illnesses in the UK annually
- 3 million people economically inactive due to long-term ill health

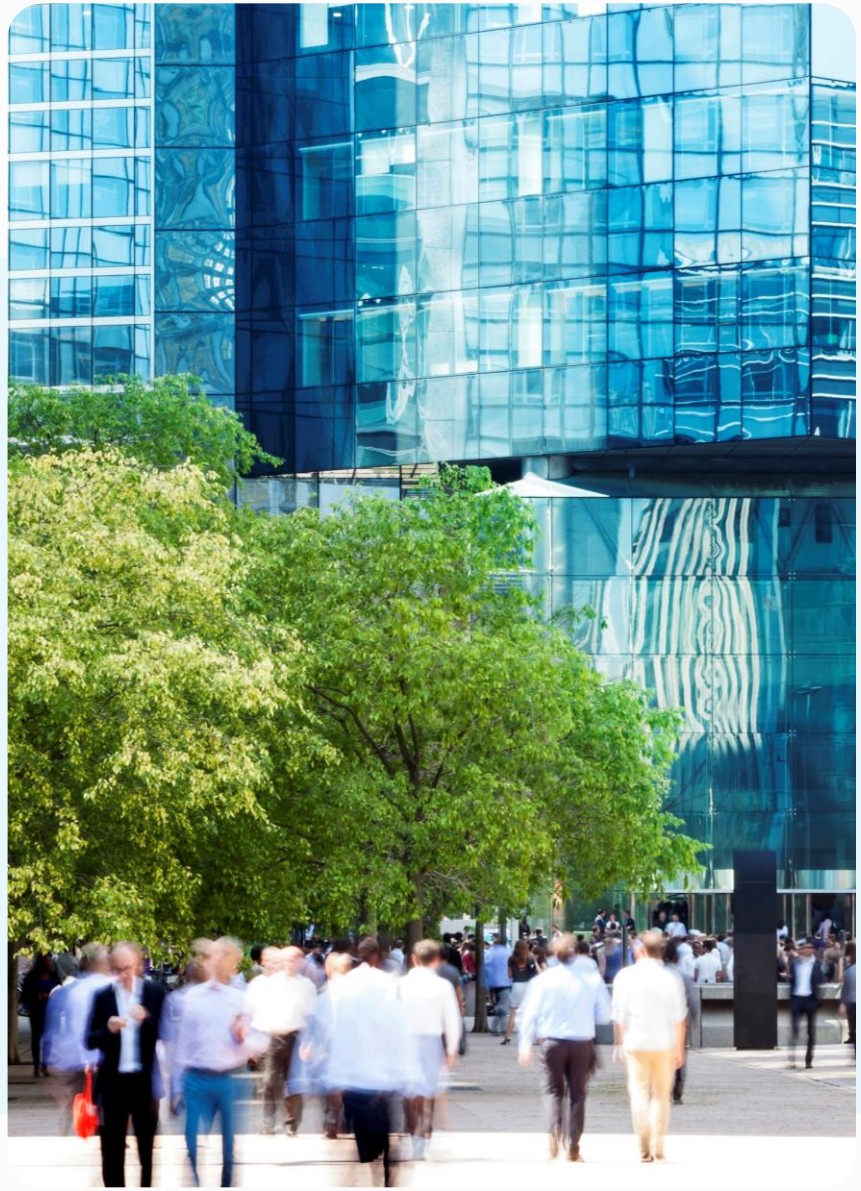
Changing Workforce Demographics

- Female doctors now outnumber males in the UK
- Female representation in engineering up to 16.9% by 2025
- Increasing ethnic diversity in the workforce

Traditional PPE: The Fit Problem

PPE historically designed for the ‘average’ white European/American male

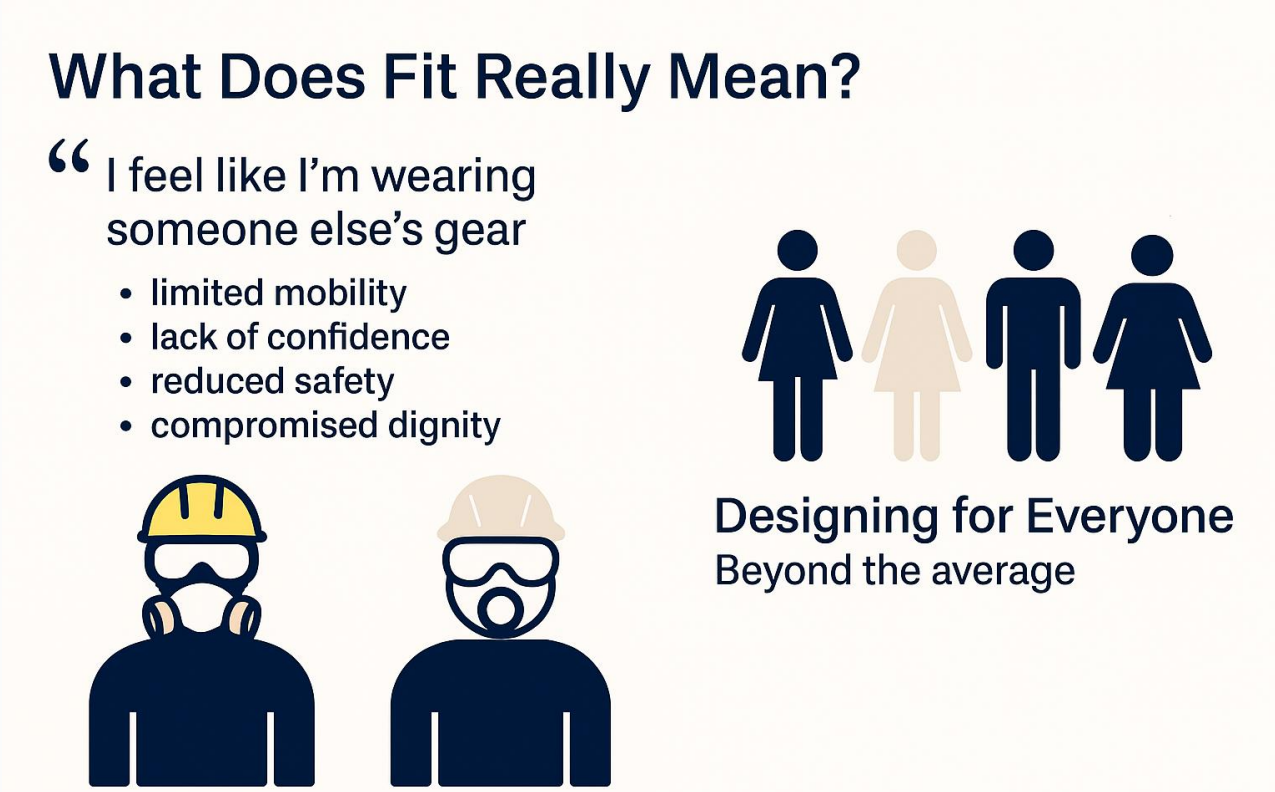
- Poor fit for women, ethnic minorities, and others
- Impact: discomfort, safety risks, exclusion



What Does Fit Really Mean? Designing for Everyone: Beyond the Average

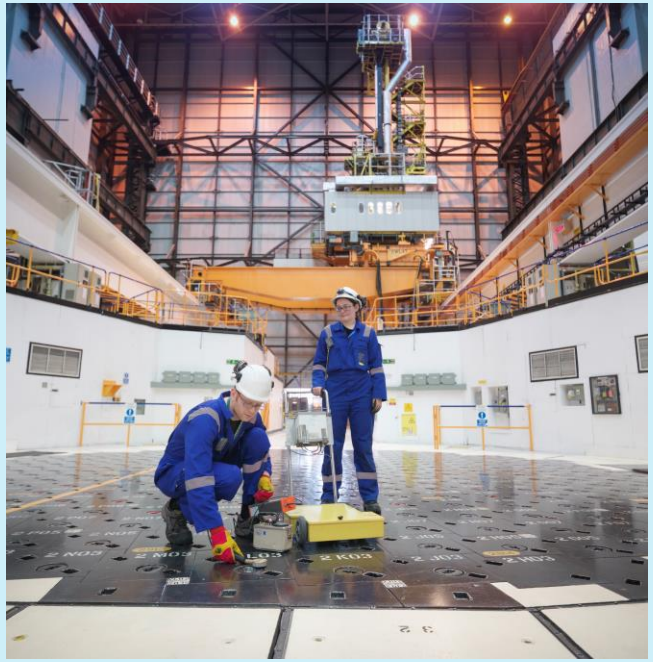
57% of women respondents found that their PPE “sometimes or significantly hampered their work”

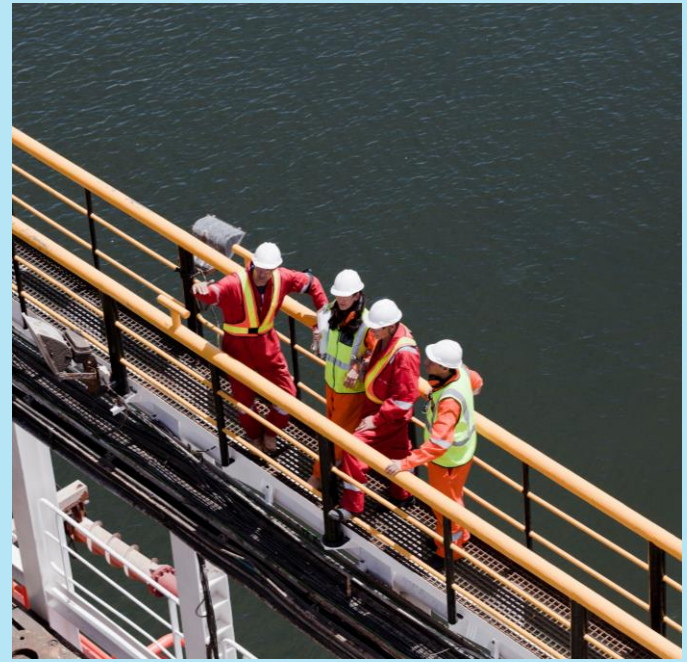
- Other research found that health workers “even when available, PPE access has sometimes been influenced by gender power imbalances in the health workforce” and also noted that “PPE distribution during the pandemic was based on priority which mirrored existing power hierarchies within many hospital systems”.



Evolution: Customisation & Diversity

- PPE now being diversified for gender, ethnicity, body type, and job role
- Examples of inclusive PPE in practice





Revolution – Smart, Connected & Sustainable PPE

- Digital technologies (IoT, AR, AI) in PPE
- Real-time monitoring, enhanced safety, and training
- Sustainability and Circularity of PPE

Opportunities & Challenges

- Data privacy, discrimination, cybersecurity
- Innovation and collaboration opportunities

BS 30417: Provision of Inclusive PPE – Guide

- What is BS 30417? Practical, person-centred guidance for inclusive PPE
- Covers selection, provision, fitting, training, and feedback
- Supports legal compliance and best practice

- **BS 30417 is available at no cost from the BSI website**

What’s Next? Future Directions

- Government involvement: Parliamentary roundtables, support from MPs
- European standardization: CEN-CLC/JTC 23/WG 6 working group on inclusive PPE
- Ongoing review, user feedback, and continuous improvement

Overview of CEN–CLC/JTC 23– Horizontal Topics for PPE

Purpose & Scope

- A Joint Technicæal Committee by CEN and CENELEC to address horizontal standardisation topics across all PPE categories
- Focuses on frameworks, guidelines, tools and requirements support existing product-specific Technical Committees (TC)
- Covers cross-cutting themes

CEN CENELEC

WG 1: Terms & Definitions

WG 2: Compatibility, Ergonomics, Comfort

WG 3: Sustainability in PPE

WG 4: Smart PPE

WG 5: Fire & rescue PPE

WG 6:

Inclusive PPE

bsi

Call to Action

- Adopt and endorse BS 30417
- Prepare for the 11 November 2025 transition
- Get involved: share experiences, join working groups, drive change

Thank you

Any questions for our speakers?

Nathan Shipley

Certification Technical Manager

Expert in PPE testing and certification, supporting manufacturers in navigating CE/UKCA requirements and Kitemark approvals.

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Specialist in European and international standards, with a focus on inclusion and how standards like BS 30417 support diverse workforce needs.

Protective Eyewear suite of standards

White paper

BS EN ISO 16321-1:2022+A1:2025
BS EN ISO 16321-2:2021 and
BS EN ISO 16321-3:2022

bsi Your partner in progress

Download your copy of our whitepaper