


FaceSymbol

Report on the design, development and testing of 11 instructional symbols for use with automated, facial recognition systems.

Contents

- 1. Introduction and objectives 4**
- 2. Process 4**
 - 2.1 Establishing requirements 4
 - 2.2 Collection of existing symbols..... 7
 - 2.3 Symbol design 10
 - 2.3.1 ISO & IEC Symbol standards 10
 - 2.3.2 Graphic design and symbol development..... 11
- 3. “Socialisation” of the FaceSymbol project 11**
 - 3.1 BSI panel PH/8/2 11
 - 3.2 BSI panel IST/44 and ISO/IEC JTC 1/SC 37..... 12
- 4. Symbol testing 12**
 - 4.1 “SurveyMonkey” Peer reviews 12
 - 4.2 Testing to ISO standards 13
 - 4.3 Conducting the ISO 9186-1 tests..... 14
 - 4.3.1 Trial ISO 9186-1 tests 14
 - 4.3.2 Final ISO 9186-1 tests 14
 - 4.4 Highest ranking symbols..... 15
- 5. ISO 9186-1 Test results 17**
 - 5.1 Comprehension test results for “Facial recognition” (symbols 1 & 2)..... 17
 - 5.2 Comprehension test results for “Look to a point” (symbols 3 & 4) 18
 - 5.3 Comprehension test results for “Manual passport control” (symbols 5 & 6) 19
 - 5.4 Comprehension test results for “Move hair” (symbols 7 & 8)..... 20
 - 5.5 Comprehension test results for “Do not smile” (symbols 9 & 10) 21
 - 5.6 Comprehension test results for “Open passport” (symbols 11 & 12) 22
 - 5.7 Comprehension test results for “No hats” (symbols 13 & 14) 23
 - 5.8 Comprehension test results for “Wait” (symbols 15 & 16)..... 24
 - 5.9 Comprehension test results for “No sunglasses” (symbols 17 & 18)..... 25
 - 5.10 Comprehension test results for “Proceed forward” (symbols 19 & 20)..... 26
 - 5.11 Comprehension test results for “Single person” (symbols 21 & 22) 27
- 6. ISO adoption and registration..... 28**
- 7. Observations, conclusions and recommendations 28**

7.1 “Facial recognition” and Electronic passport symbol  28

7.2 “Do not smile” symbol 28

7.3 “Wait” symbol..... 28

7.4 “No sunglasses” symbol..... 28

7.5 “Single person” symbol..... 29

8. Accessibility 29

8.1 Project background 29

8.2 The UK Equality Act 2010 30

8.3 Review to ISO accessibility requirements for standards makers..... 30

8.4 Symbol design 30

8.5 Rights of disabled persons at UK airports 30

8.6 UKBA statement (2012-05-22) 31

9. Annex A - First set of symbols for “SurveyMonkey” review by Project Team..... 32

10. Annex B - Second set of symbols for “SurveyMonkey” review by Project team..... 34

11. Annex C - Examples of ISO 9186-1 test pages..... 36

12. Bibliography - Symbol sources researched 39

Revision History 40

1. Introduction and objectives

To enable biometric passport ("ePassport") gates at border control (international airports, sea ports and rail stations) to be used efficiently and effectively by users from diverse cultures, instructional symbols for their use must be consistent, easily recognisable and comprehensible.

Currently there are no commonly adopted standards for symbols used in this context. With the absence of an established international standard set of symbols for use with biometric identity systems (e.g. facial, iris and finger print) individual product manufacturers and system implementers are already introducing their own proprietary symbols. These vary by manufacturer and country of implementation. This in turn, confuses travellers, reduces the usage of these systems and extends the period of their implementation and acceptance.

The main objectives of this project, carried out on behalf of the British Standards Institution (BSI) and United Kingdom Border Agency (UKBA) were as follows:

- To establish a standard set of instructional symbols for use by all travellers on electronic passport ("ePassport") facial recognition systems at international airports, sea ports and rail stations,
- To provide those symbols to ISO/IEC JTC 1/SC 37 (Biometrics) for inclusion in ISO/IEC 24779-4 – *Biometrics – Cross-jurisdictional & societal aspects of implementation of biometric technologies – Pictograms, icons & symbols: Face*,
- To submit the symbols to ISO/TC 145 – Graphical symbols, for international standards adoption and inclusion in ISO 7001 - *Graphical symbols – Public Information symbols*.

2. Process

2.1 Establishing requirements

In September 2011 invitations were made to a number of business and professional organisations to participate in a launch meeting at the BSI headquarters in west London to agree the symbol requirements for this project.

This meeting was held at the BSI on 9th August 2011 and attended by 13 representatives from the following organisations:

- British Standards Institution:
 - Biometrics programme.
 - IST/44 – Biometrics (UK committee to ISO/IEC JTC 1/SC 37 - Biometrics).
 - Consumer interest group.
- Institute of Scientific & Technical Communicators (ISTC).
- FP Fidelity/Morpho.
- Fujitsu.
- KeCrypt Systems Ltd.
- Phoneability.
- United Kingdom Border Agency (UKBA).

- UK Home Office – Centre for Applied Science and Technology (CAST).

At that meeting it was agreed that a workshop would be held at the BSI with wider participation, to:

- Identify appropriate workshop delegates.
- Agree which existing symbols will be required.
- Agree and develop a function list for symbols (including variants).
- Identify how many symbols already exist or will need designing.
- Research symbols currently available (including NIST) and access to analysis of UKBA data.
- Discuss the development of new symbols.
- Agree the symbol set for trial submission.
- Agree the implementation and management of live trials.
- Discuss the management and collection of data.
- Identify an appropriate symbol designer and use above information to discern workload.
- Discuss the provision of a report.

Consequently, a workshop was held at the BSI on Thursday 13th October 2011 at which experts from the following organisations participated:

- British Standards Institution:
 - Biometrics programme.
 - IST/44 – Biometrics (UK committee to ISO/IEC JTC 1/SC 37 - Biometrics).
 - PH/8 – Graphical Symbols (UK committee to ISO/TC 145 – Graphical symbols).
 - Consumer interest group.
- Institute of Scientific & Technical Communicators (ISTC).
- FP Fidelity/Morpho.
- Fujitsu.
- Gatwick Airport Ltd.
- IBM.
- KeCrypt Systems Ltd.
- Safran Morpho.
- Sign Design Society.
- US National Institute of Standards and Technology (NIST).
- United Kingdom Borders Agency (UKBA).
- UK Home Office – Centre for Applied Science and Technology (CAST).
- Vision-box.

The key outcomes from this meeting were:

- An agreed list of 11 information and instruction symbols, and subsequent actions that would need either to be adapted from pre-existing symbols or drafted as new.
- It was agreed that it was the remit of this project to define/produce only widely applicable symbols and that symbols that either depicted a complicated process (e.g. involving movement) or which were specific to particular automated border control systems should be left to the manufacturer to design or be depicted in video format.
- On the basis of workshop discussion, a scope/objectives document was drafted.
- It was agreed that the workshop attendees would comment on the list of agreed names, descriptions and symbols by Monday 14th November 2011. Additionally, if any attendees had additional symbols that could be supplied, they should do so by that date.
- BSI to liaise with standards bodies to check on the development of any new symbols not yet generally available.
- The technical liaison and BSI to examine the implications of the discussed test methodology on the symbol design remit and also the resources required at the test site (London Gatwick airport).
- BSI to agree means of testing (paper/electronic) based on cost and stipulations of methodology.
- BSI/technical liaison to produce updated symbol specification to facilitate sourcing of symbol draughtsman/designer.

The list of agreed symbols and functions were as follows:




Symbol name:	Use of symbol:	Action required on reading symbol:
Facial recognition	Used on wayfinding signs, and to identify the actual ePassport facial recognition equipment station.	Follow this symbol on wayfinding signage to go to ePassport/biometric facial recognition station.
Single person	Used at approach/entrance to ePassport facial recognition equipment station.	Enter only one person at a time, no groups of people.
Open passport	<ul style="list-style-type: none"> • Information symbol presented within ePassport facial recognition equipment station. • Used on equipment (symbol or icon). 	Place your ePassport on scanner with the image/data page presented face down.
Wait	Used on equipment (symbol or icon).	Do nothing. Wait whilst the system is processing your information.
Proceed forward	Used on equipment (symbol or icon).	Go forward to next operation.
Go to manual passport control	Used on equipment (symbol or icon).	Go to immigration officer/manned desk for assistance (automated facial recognition process is unsuccessful and aborted).
No hats	<ul style="list-style-type: none"> • Information symbol presented within ePassport facial recognition equipment station. • Used on equipment (symbol or icon). 	Remove all headgear



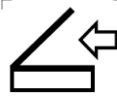
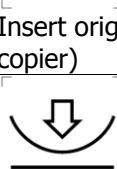






No sunglasses	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Remove sunglasses
Do not smile	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Remain "straight-faced", do not smile
Move hair	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Move hair from over eyes.
Look to a point	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Look forward, straight at camera














2.2 Collection of existing symbols








Based upon this list, the workshop participants were requested to provide examples of any existing symbols that matched these titles and/or functions. In addition, research was carried out to find potentially relevant symbols from a number of standardised and non-standardised sources (clause 12. Bibliography lists the symbol sources).

Subsequently 36 existing symbols were collected. However, they used a variety of graphical metaphors and were presented in a variety of styles and colour palettes, as illustrated in the following table:

	Name:	Use of symbol:	Action required on reading symbol:	Closest existing graphic:	Bibliography ref:
1.	Facial Recognition	Used on wayfinding signs, and to identify the actual ePassport facial recognition equipment station.	Follow this symbol on wayfinding signage to go to ePassport/biometric facial recognition station.		5.
2.	Single person	Used at approach/entrance to ePassport facial recognition equipment station.	Enter only one person at a time, no groups of people.		UK BA ePassport Posters
					13. (5.7.1 Patient number... ISO 7000 2610)

					21.
3.	Open Passport	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Place your ePassport on scanner with the image/data page presented face down.		UK BA ePassport Posters
				 <p>Insert original (into copier)</p>	8. (+ ISO 7000-0672)
				 <p>Friction pressure</p>	8. (+ ISO 7000-0693)
					21.
4.	Wait	Used on equipment (symbol or icon).	Do nothing. Please be patient whilst the system is processing your information.	 <p>B. Wait/Hold (a)</p>	4. (8.6)
				 <p>C. Wait/Hold (b)</p>	
				   <p>Hour glass Wrist watch Desk clock</p>	<p>2. NOTE: A full (lower section) hour glass is used in ISO 15223 to indicate a use-by date for medical devices (ISO7000 2607).</p>

					3.
5.	Proceed forward	Used on equipment (symbol or icon).	Go forward to next operation. <i>(Comment: Avoid confusion with move body forward for scanning)</i>	 Go to next..	10.
					12.
				  AIGA Up arrow	20.
					3.
6.	Go to manual Passport Control	Used on equipment (symbol or icon).	Go to immigration officer/manned desk for assistance (process is unsuccessful and aborted). <i>(Comments re. graphical images:</i> 1. <i>Would benefit from the addition of a direction arrow,</i> 2. <i>Companion symbols also exist for "Customs" and include a suitcase.)</i>	 <small>Figure 9 Give up – unacceptable capture</small>	5.
				 Immigration/Quarantine/Inspection	19.
				 Immigration	21
					21.
7.	No hats	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Remove all headgear		UK BA ePassport Posters
					23.
8.	No sunglasses	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition 	Remove sunglasses <i>(Comment: And spectacles?)</i>	 Also, see 7. Above.	13.

		<p>equipment station.</p> <ul style="list-style-type: none"> Used on equipment (symbol or icon). 			
9.	Do not smile	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Remain "straight-faced", do not smile		22.
					23.
10.	Move hair	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Move hair from over eyes (and forehead?)		22.
					23.
11.	Look to a point	<ul style="list-style-type: none"> Information symbol presented within ePassport facial recognition equipment station. Used on equipment (symbol or icon). 	Look forward, straight at camera		22.
					23.
					

2.3 Symbol design

2.3.1 ISO & IEC Symbol standards

For visual consistency a common style was necessary to aid future selection processes and prepare for ISO adoption. As two of the key objectives were to submit the final symbols to ISO organisations for adoption, it was necessary to conform to an ISO standard.

Two standards options were available to use:

1. ISO & IEC 80416 - *Basic principles for graphical symbols for use on equipment*. This standard is used to create symbols for use when controlling electronic

...making excellence a habit.™

or mechanical equipment. Symbols drafted to this standard, when adopted and registered by ISO and the IEC are made available for public use via the IEC 60417 *Graphical symbols* and ISO 7000:2012 *Graphical symbols for use on equipment – Registered symbols* databases. This standard comprises 4 parts as follows:

- IEC 80416-1:2008 - Part 1: *Creation of graphical symbols for registration.*
 - ISO 80416-2:2001 - Part 2: *Form and use of arrows.*
 - IEC 80416-3:2002 - Part 3: *Guidelines for the application of graphical symbols.*
 - ISO 80416-4:2005 - Part 4: *Guidelines for the adaptation of graphical symbols for use on screens and displays (icons).*
2. ISO 22727:2007 - *Graphical symbols - Creation and design of public information symbols – Requirements.* This standard is used to create symbols to be used for information and guidance by the public. Symbols drafted to this standard, when adopted and registered by ISO are made available for public use via ISO 7001:2007 - *Graphical symbols - Public information symbols.*

As the symbols are intended for public information and instruction, and not for the operation of equipment, it was decided to follow the guidance of ISO 22727:2007.

2.3.2 Graphic design and symbol development

To create the symbols for selection the BSI contracted the services of a graphic design company (Chris Green Design) with proven experience of quality logotype, symbol and icon design.

To create a visually consistent set of symbols, the graphic designer was briefed and provided with a copy of ISO 22727 to create a set of new symbols (based upon the function descriptions) and other variants (based upon the more appropriate symbols collected) in conformance with ISO 22727:2007 for peer review by members of the Project Team. This resulted in the creation of a total of 5 to 7 variants for each of the 11 symbols required, which were reviewed by the project technical liaison and revisions carried out before being submitted for the first Project Team review.

A further two design iterations were carried out prior to the second Project team review.

The symbols used in the first SurveyMonkey/Project team review can be found in Annex A (clause 9.), and the symbols used in the second SurveyMonkey/Project Team review can be found in Annex B (clause 10.).

3. “Socialisation” of the FaceSymbol project

As they would be supporting the ISO registration and use of the final symbols it was necessary to keep two standards development communities informed of the FaceSymbol project plans and progress.

3.1 BSI panel PH/8/2

A PowerPoint presentation was given to the meeting of PH/8 (Public information graphical symbols and signs) which was held at the BSI on 29th March 2012.

It was agreed that PH/8/2 would process the symbols documentation to ISO/TC 145 for ISO adoption and potential inclusion in ISO 7001- *Graphical symbols - Public information symbols*

NOTE 1: This process will provide ISO registration numbers for use in ISO/IEC 24779-4 – Biometrics – Cross-jurisdictional & societal aspects of implementation of biometric technologies – Pictograms, icons & symbols: Face.

NOTE 2: ISO/TC 145 has horizontal responsibility for symbols provision across ISO committees.

3.2 BSI panel IST/44 and ISO/IEC JTC 1/SC 37

A PowerPoint presentation was given to the meeting of IST/44 (Biometrics) which was held at the BSI on 27th April 2012.

For information purposes and comment a member of IST/44 provided an updated version of the presentation to the Plenary and Working Groups meeting of ISO/IEC JTC 1/SC 37 (Biometrics) held at AFNOR in Paris during the week of 16th July 2012.

4. Symbol testing

4.1 "SurveyMonkey" Peer reviews

To reduce the number of candidate variants (from between 5 and 7 variants to 2 variants per symbol) for the ISO 9186-1 testing it was decided to conduct a two-stage peer review by members of the Project Team and their colleagues.

A Web-based survey was prepared using "SurveyMonkey" to identify the preferred 2 variants per set. The link was circulated to the project team members with a request to circulate it as far and wide as possible to colleagues and interested parties.

Annex A (clause 9.) shows the first set of symbols reviewed.

Respondents were asked to rank the symbols in order of preference and provide comments.

The 1st "SurveyMonkey" review for the 11 symbols was carried out between 5th and 23rd April 2012. Ninety-nine responses were received together with 264 comments. The symbols were ranked by preference in percentages. There were several clear winners, a number of repeated, constructive comments and several inappropriate comments, e.g. "Use words".

A 'phone conference call was held on 15th May for members of the project team and it was agreed to modify several of the symbols, create some new variants and conduct a second "SurveyMonkey" review of variants to 9 of the symbols.

Two further design iterations were carried out to provide the candidate symbols for the 2nd "SurveyMonkey" review which was conducted between 1st and 15th June 2012. For this test the winning candidates from the first test were used, together with modified versions and new designs resulting from the comments received from the 1st test. No opportunity for commenting was provided for this stage. There were 14 responses to this survey. The winning pairs of variants were used for the subsequent ISO 9186-1 tests.

Annex B (clause 10.), shows the second set of symbols reviewed.

The "SurveyMonkey" reviews were carried out in parallel with the initial ISO 9186-1 tests at Gatwick airport.

The following image shows a typical page from the first "SurveyMonkey" review.

*9. Which of the following symbols best represents the command 'one person only'? Please rank the below symbols in order of preference:

	1st	2nd	3rd	4th	5th	6th	7th
Symbol 1	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Symbol 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Symbol 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Symbol 4	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Symbol 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Symbol 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Symbol 7	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments

Single person

1

2

3

4

5

6

7

4.2 Testing to ISO standards

ISO 9186 - *Graphical symbols - Test methods*, has been developed by ISO/TC 145 to test the comprehensibility and perceptual qualities of graphical symbols. It currently comprises two parts:

- ISO 9186-1:2007 - Part 1: *Methods for testing comprehensibility*, and
- ISO 9186-2:2008 - Part 2: *Method for testing perceptual quality*.

This standard is currently under revision and will include a new Part 3: *Method for testing recognisability*.

The DIS version of ISO 9186-1 was considered to be the most appropriate for testing the FaceSymbol candidate symbols.

NOTE 1: A DIS (Draft International Standard) is the penultimate, balloting version in the ISO development process.

NOTE 2: The DIS ballot was completed in August 2012 with 100% of the national bodies voting approving the draft. Consequently, there should be no significant changes to the draft which will now progress to its Final Draft International Standard (FDIS) ballot.

The ISO 9186-1 requirements to test candidate symbols are as follows:

- The tests can be paper-based or conducted “on-line”,
- A minimum of 50 respondents shall be tested for each variant (minimum is 2 variants per symbol) for each symbol required for residents from at least two countries (or cultures). This totalled a minimum of 2200 individual response forms.
- The process for conducting the tests is as follows:

- 1st describe context-of-use to respondents,
- Collect data on respondents’ age, sex, education level and culture.

NOTE: Data can be collected on levels of disability of the respondents. However, the target systems are not intended for the use of disabled passengers at UK airports, and special provisions are available to enable disabled persons to bypass this form of passport control. See clause 8. – Accessibility.

- Question 1: “What do you think this symbol means?”
- Question 2: “What action do you think you should take in response to this symbol?”
- The responses are recorded on the test sheets and graded as follows:
 - 1. Correct answer,
 - 2a. Wrong answer,
 - 2b. Wrong answer, but the response given is the opposite of the intended meaning,
 - 3. The response given is “Don’t know”, and
 - 4. No response is given.
- The criteria for acceptance on the comprehension test of a successful symbol is that the percentage of responses in category 1 (Correct answer) shall be 66% or over.

4.3 Conducting the ISO 9186-1 tests

To conduct the tests the management of (London) Gatwick Airport Limited volunteered the services of their Market Research and Insight Team.

4.3.1 Trial ISO 9186-1 tests

As experienced specialists would need to be hired to carry out the surveys, an initial set of tests were conducted to assess the resources and time required. These initial tests were carried out in the departure lounges at Gatwick airport on 23rd and 25th May 2012 following the procedure specified in ISO 9186-1 and using a sub-set of the symbols currently in development. The tests were successful and enabled the Market Research and Insight Team to plan the resources and schedule the final tests.

4.3.2 Final ISO 9186-1 tests

The final tests were carried out following the procedure specified in ISO 9186-1 in the departure lounges at Gatwick airport primarily between 27th June 2012 and 15th July 2012. Specific, departing flights were chosen to ensure that responses were obtained from nationals resident in the two cultural areas targeted:

- Europe (results obtained from United Kingdom, German, Italian, Spanish, Portuguese, Polish, Swedish, Greek, Hungarian, Netherlands, French and Cypriot nationals), and

...making excellence a habit.™

- Far East (results obtained from Japanese, Chinese, Korean, Vietnamese, Taiwanese, Thai and Philippine nationals).

The tests were carried out using paper forms which the respondents could complete themselves or could be completed on their behalf by the administrators.

NOTE: The administrators remarked that it was difficult to obtain results from Far Eastern nationals over the age of 50 (age group) due to their poor command of English.

A minimum of 50 completed response forms, per symbol variant, per culture were obtained.

Part of the final testing was observed by the project technical liaison and BSI project manager.

Clause 11. Appendix C contains examples of the test pages.

4.4 Highest ranking symbols

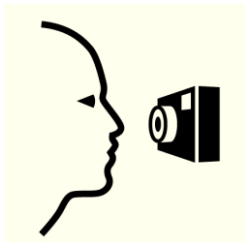
The following symbols scored the highest percentage "correct" answers (category 1). The ISO acceptance criteria require that this be 66% or greater, of the sum of responses assessed as "Correct" (1.), "Wrong" (2a) and "Don't know" (3).

However, for three symbols the highest percentages for "correct" answer scores were:

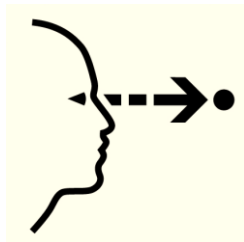
- "Facial recognition" - between 56.6% and 28.8%.
- "Do not smile" - between 48.0% and 28.4%.
- "Wait" - between 39.7% and 17.3%.

Clause 7 contains recommendations on modifying the symbol designs.

The following are the highest ranking symbols from the variant pairs tested:



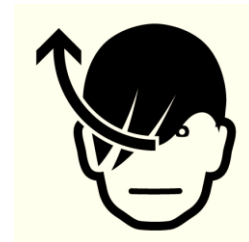
Facial Recognition



Look to a point



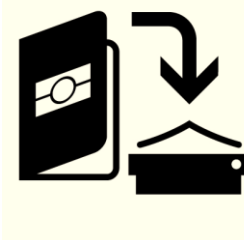
Manual passport control



Move hair



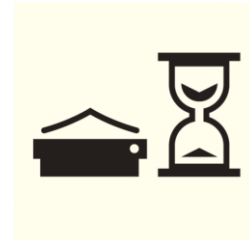
Do not smile



Open passport



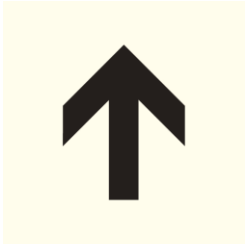
No Hats



Wait



No sunglasses



Proceed forward

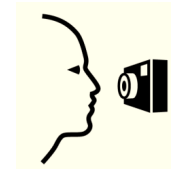


Single person

5. ISO 9186-1 Test results

5.1 Comprehension test results for "Facial recognition" (symbols 1 & 2)

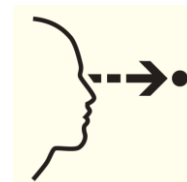
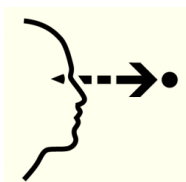
Referent:		Year of test:		Month of test		
A human head (side view) and a "still" image camera.		2012		July		
Function:						
Used on wayfinding signs, and to identify the actual ePassport facial recognition equipment station ("eGate").						
Field(s) of application:						
Direction and location signage international airports, sea ports and international rail stations						
Intended user group:						
International travellers and passengers						
Numbers of respondents by culture:	Symbol 1			Symbol 2		
	Europe:		Far East:	Europe:		Far East:
Age: 15-30 years	29	36	20	34		
Age: 31-50 years	14	15	17	11		
Age: Over 50 years	9	0	15	7		
Sex: Male	25	27	29	26		
Sex: Female	29	25	24	26		
Education level: i	10	8	13	8		
Education level: ii	15	15	19	24		
Education level: iii	30	28	19	20		



Context information:		Symbol 1 appears in airports, ports and international rail stations. You might find it on a direction sign, door or wall.						Symbol 2 appears in airports, ports and international rail stations. You might find it on a direction sign, door or wall.					
Colour:		Black & white						Black & white					
Height & width of image tested:		50mm x 50mm						50mm x 50mm					
Source:		New symbol...specially created						New symbol...specially created					
Culture:		Europe:			Far East:			Europe:			Far East:		
Sample size:		54			52			53			51		
Category		f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1	Correct	19	35	35	15	29	29	30	57	57	20	39	39
2a	Wrong	26	48	83	23	44	73	21	40	97	26	50	89
3	Don't know	9	17	100	14	27	100	2	3	100	5	9	98
4	No response	-			-			-			-		
Sum		54			52			53			50		
2b	Wrong - opposite	-		100	-		100	-		100	1	2	100

5.2 Comprehension test results for "Look to a point" (symbols 3 & 4)

Referent:	Year of test:		Month of test		
A human head (side view) with horizontal arrow from eyes to a small circular dot.	2012		July		
Function:					
Look forward, straight at camera.					
Field(s) of application:					
Biometric identity and recognition systems					
Intended user group:					
International travellers and passengers					
Numbers of respondents by culture					
	Symbol 3			Symbol 4	
	Europe:		Far East:	Europe:	
				Far East:	
Age: 15-30 years	29		36	20	
Age: 31-50 years	14		15	17	
Age: Over 50 years	9		0	15	
Sex: Male	25		27	29	
Sex: Female	29		25	24	
Education level: i	10		8	13	
Education level: ii	14		15	19	
Education level: iii	30		28	19	



Context information:	Symbol 3 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 4 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black & white						Black & white					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	New symbol...specially created						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	51			55			50			56		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	36	71	71	33	60	60	29	58	58	32	59	59
2a Wrong	5	10	81	9	16	76	8	16	74	6	11	70
3 Don't know	10	19	100	13	24	100	13	26	100	15	28	98
4 No response	-			-			-			2		
Sum	51			55			50			55		
2b Wrong - opposite	-		100	-		100			100	1	2	100

5.3 Comprehension test results for "Manual passport control" (symbols 5 & 6)

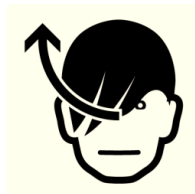
Referent:	Immigration officer, electronic passport (ePassport), table top and direction arrow.		Year of test:	2012	Month of test	July
Function:	Go to immigration officer/manned desk for assistance.					
Field(s) of application:	Biometric identity and recognition systems.					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture	Symbol 5		Symbol 6			
	Europe:	Far East:	Europe:	Far East:		
Age: 15-30 years	29	39	19	35		
Age: 31-50 years	14	14	17	12		
Age: Over 50 years	9	0	15	7		
Sex: Male	26	27	27	26		
Sex: Female	28	27	25	28		
Education level: i	10	7	13	9		
Education level: ii	14	17	17	24		
Education level: iii	30	29	20	21		



Context information:	Symbol 5 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.			Symbol 6 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.								
Colour:	Black & white			Black & white								
Height & width of image tested:	50mm x 50mm			50mm x 50mm								
Source:	New symbol...specially created			New symbol...specially created								
Culture:	Europe:		Far East:	Europe:		Far East:						
Sample size:	51		55	50		51						
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	45	83	83	42	79	79	50	96	96	49	92	92
2a Wrong	8	15	98	4	8	87	1	2	98	1	2	94
3 Don't know	1	2	100	7	13	100	1	2	100	3	6	100
4 No response	-			-			-			-		
Sum	54			52			53			55		
2b Wrong - opposite	-		100	-		100	-		100	-		100

5.4 Comprehension test results for "Move hair" (symbols 7 & 8)

Referent:	Human head outline (front view), with hair moved by curved direction arrow to one side and upwards away from eyes.		Year of test:	2012	Month of test	July
Function:	Move hair from over eyes					
Field(s) of application:	Biometric identity and recognition systems					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture						
	Symbol 7			Symbol 8		
	Europe:		Far East:	Europe:		Far East:
Age: 15-30 years	29	36	19	35		
Age: 31-50 years	14	14	17	12		
Age: Over 50 years	9	0	15	7		
Sex: Male	16	25	27	28		
Sex: Female	28	25	25	27		
Education level: i	10	7	13	8		
Education level: ii	14	16	17	24		
Education level: iii	30	26	20	23		



Context information:	Symbol 7 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 8 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black & white						Black & white					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	New symbol...specially created						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	52			53			52			54		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	49	94	94	44	83	83	37	71	71	35	67	67
2a Wrong	-	-	94	4	8	91	6	12	83	4	8	75
3 Don't know	3	6	100	5	9	100	9	17	100	13	25	100
4 No response	-			-			-			2		
Sum	52			53			52			54		
2b Wrong - opposite	-		100	-		100			100	-		100

5.5 Comprehension test results for "Do not smile" (symbols 9 & 10)

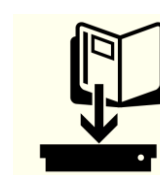
Referent:	Human head outline (front view), with smiling/open mouth covered by red, negation cross.		Year of test:	2012	Month of test	July
Function:	Remain "straight-faced", do not smile					
Field(s) of application:	Biometric identity and recognition systems.					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture	Symbol 9		Symbol 10			
	Europe:	Far East:	Europe:	Far East:		
Age: 15-30 years	29	38	19	35		
Age: 31-50 years	14	13	17	12		
Age: Over 50 years	9	0	15	7		
Sex: Male	26	26	27	27		
Sex: Female	28	26	25	27		
Education level: i	10	7	13	8		
Education level: ii	14	16	17	25		
Education level: iii	30	28	20	21		



Context information:	Symbol 9 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.			Symbol 10 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.								
Colour:	Black, white and red (negation cross)			Black, white and red (negation cross)								
Height & width of image tested:	50mm x 50mm			50mm x 50mm								
Source:	New symbol...specially created			New symbol...specially created								
Culture:	Europe:		Far East:	Europe:		Far East:						
Sample size:	50		51	53		55						
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	29	48	48	17	33	33	25	47	47	11	20	20
2a Wrong	18	36	94	25	49	82	20	38	85	43	78	98
3 Don't know	3	6	100	9	18	100	8	15	100	-	-	98
4 No response	-			-			-			-		
Sum	50			51			53			54		
2b Wrong - opposite	-		100	-		100	-		100	1	2	100

5.6 Comprehension test results for "Open passport" (symbols 11 & 12)

Referent:	Open "ePassport", direction arrow to scanning device.		Year of test:	2012	Month of test	July
Function:	Place your ePassport on scanner with the image/data page presented face down.					
Field(s) of application:	Biometric identity and recognition systems					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture						
	Symbol 11			Symbol 12		
	Europe:		Far East:	Europe:		Far East:
Age: 15-30 years	29		36	18		34
Age: 31-50 years	14		14	17		12
Age: Over 50 years	9		0	15		7
Sex: Male	26		27	27		8
Sex: Female	28		24	24		24
Education level: i	10		7	13		21
Education level: ii	14		15	16		26
Education level: iii	30		28	20		27



Context information:	Symbol 11 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 12 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black & white						Black & white					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	New symbol...specially created						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	54			52			52			54		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	45	83	83	35	67	67	38	73	73	35	66	66
2a Wrong	4	7	90	6	12	79	7	13	86	6	11	77
3 Don't know	5	10	100	10	19	98	7	14	100	12	23	100
4 No response	-			-			-			1		
Sum	54			51			52			54		
2b Wrong - opposite	-		100	1	2	100	-		100	-		100

5.7 Comprehension test results for "No hats" (symbols 13 & 14)

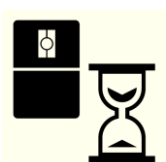
Referent:	Human head outline (front view), Human with Baseball cap, superimposed with red, negation cross, or Trilby hat superimposed with red, diagonal negation bar		Year of test:	2012	Month of test	July
Function:	Remove all headwear.					
Field(s) of application:	Biometric identity and recognition systems.					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture						
	Symbol 13			Symbol 14		
	Europe:		Far East:	Europe:		Far East:
Age: 15-30 years	29	37	19	35		
Age: 31-50 years	14	14	17	11		
Age: Over 50 years	9	0	15	6		
Sex: Male	26	27	27	27		
Sex: Female	28	25	25	25		
Education level: i	10	7	13	8		
Education level: ii	14	16	17	25		
Education level: iii	30	28	20	19		



Context information:	Symbol 13 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 14 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black, white and red (negation cross)						Black, white and red (negation bar)					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	New symbol...specially created						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	54			52			53			55		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	53	98	98	50	96	96	53	100	100	54	100	100
2a Wrong	-	-	98	1	2	98	-	-	100	-	-	100
3 Don't know	1	2	100	1	2	100	-	-	100	-	-	100
4 No response	-			-			-			1		
Sum	54			52			53			54		
2b Wrong - opposite	-		100	-		100	-		100	-		100

5.8 Comprehension test results for "Wait" (symbols 15 & 16)

Referent:	Open "ePassport", scanning device and hourglass.		Year of test:	2012	Month of test	July
Function:	Wait whilst the system is processing your information.					
Field(s) of application:	Biometric identity and recognition systems					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture						
	Symbol 15			Symbol 16		
	Europe:		Far East:	Europe:		Far East:
Age: 15-30 years	29	37	18	32		
Age: 31-50 years	14	14	17	12		
Age: Over 50 years	9	0	15	7		
Sex: Male	26	27	26	24		
Sex: Female	28	25	25	27		
Education level: i	10	7	13	7		
Education level: ii	14	16	16	24		
Education level: iii	30	28	20	30		



Context information:	Symbol 15 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 16 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black & white						Black & white					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	New symbol...specially created						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	54			52			53			54		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	12	21	21	9	18	17	21	41	41	12	23	23
2a Wrong	10	19	40	9	17	35	10	19	60	9	17	40
3 Don't know	30	56	96	30	59	94	20	38	98	29	55	95
4 No response	-			1	2		1	2		1		
Sum	52			49			52			51		
2b Wrong - opposite	2	4	100	3	6	100	1	2	100	3	5	100

5.9 Comprehension test results for "No sunglasses" (symbols 17 & 18)

Referent:	Human head outline (front view), with dark glasses, superimposed with red, negation cross (17), or dark glasses superimposed with red, diagonal negation bar (18).		Year of test:	2012	Month of test	July
Function:	Remove sunglasses.					
Field(s) of application:	Biometric identity and recognition systems.					
Intended user group:	International travellers and passengers.					
Numbers of respondents by culture						
	Symbol 17			Symbol 18		
	Europe:		Far East:	Europe:		Far East:
Age: 15-30 years	29	36	19	35		
Age: 31-50 years	14	14	17	12		
Age: Over 50 years	9	0	15	7		
Sex: Male	26	25	27	27		
Sex: Female	28	25	25	27		
Education level: i	10	7	13	8		
Education level: ii	14	16	17	25		
Education level: iii	30	26	20	21		



Context information:	Symbol 17 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 18 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black, white and red (negation cross)						Black, white and red (negation cross)					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	New symbol...specially created						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	55			52			53			55		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	55	100	100	50	96	96	52	98	98	54	100	100
2a Wrong	-	-	100	2	4	100	-	-	98	-	-	100
3 Don't know	-	-	100	-	-	100	1	2	100	-	-	100
4 No response	-	-	100	-	-	100	-	-	100	1	-	100
Sum	55			52			53			55		
2b Wrong - opposite	-	-	100	-	-	100	-	-	100	-	-	100

5.10 Comprehension test results for "Proceed forward" (symbols 19 & 20)

Referent:	Vertical, upward pointing arrow (19), or moving human being and upward perspective arrow (20).		Year of test:	2012	Month of test	July
Function:	Go forward to next operation/EXIT.					
Field(s) of application:	Biometric identity and recognition systems					
Intended user group:	International travellers and passengers					
Numbers of respondents by culture						
	Symbol 19			Symbol 20		
	Europe:	Far East:		Europe:	Far East:	
Age: 15-30 years	29	39		19	34	
Age: 31-50 years	14	14		17	12	
Age: Over 50 years	9	0		15	7	
Sex: Male	26	27		27	26	
Sex: Female	28	27		25	27	
Education level: i	10	7		13	8	
Education level: ii	14	17		17	24	
Education level: iii	30	29		20	21	



Context information:	Symbol 19 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.						Symbol 20 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.					
Colour:	Black & white						Black & white					
Height & width of image tested:	50mm x 50mm						50mm x 50mm					
Source:	American Institute of Graphic Arts for the U.S. Department of Transportation						New symbol...specially created					
Culture:	Europe:			Far East:			Europe:			Far East:		
Sample size:	54			52			54			54		
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %
1 Correct	52	96	96	49	94	94	41	76	76	32	59	59
2a Wrong	-	-	96	3	6	100	8	15	91	13	24	83
3 Don't know	2	4	100	-	-	100	5	9	100	9	17	100
4 No response	-			-			-			-		
Sum	54			52			54			54		
2b Wrong - opposite	-		100	-		100	-		100	-		100

5.11 Comprehension test results for "Single person" (symbols 21 & 22)

Referent:	Year of test:	Month of test		
Single standing person with multiplication symbol ("x") and numeral 1 (21), or One large and two smaller persons side by-side, with red, negation "X" superimposed over two smaller people (22).	2012	July		
Function:				
Enter only one person at a time, no groups of people.				
Field(s) of application:				
Biometric identity and recognition systems.				
Intended user group:				
International travellers and passengers.				
Numbers of respondents by culture				
	Symbol 21		Symbol 22	
	Europe:	Far East:	Europe:	Far East:
Age: 15-30 years	29	38	19	34
Age: 31-50 years	14	14	20	12
Age: Over 50 years	9	0	12	7
Sex: Male	26	27	27	26
Sex: Female	28	28	25	27
Education level: i	10	7	13	8
Education level: ii	14	17	17	24
Education level: iii	30	28	20	21



Context information:	Symbol 21 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.	Symbol 22 appears in airports, ports and international rail stations. You might find it on an instruction sign at an electronic passport station.											
Colour:	Black & white	Black, white and red (negation X)											
Height & width of image tested:	50mm x 50mm	50mm x 50mm											
Source:	New symbol...specially created	New symbol...specially created											
Culture:	Europe:	Far East:											
Sample size:	54	52											
Category	f	%	cum %	f	%	cum %	f	%	cum %	f	%	cum %	
1	Correct	46	85	85	38	73	73	47	87	87	41	78	78
2a	Wrong	3	6	91	4	8	81	5	9	96	5	9	87
3	Don't know	5	9	100	9	17	98	2	4	100	6	11	98
4	No response	-			-			-			-		
Sum		54			51			54			52		
2b	Wrong - opposite	-		100	1	2	100			100	1	2	100

6. ISO adoption and registration

The process is now underway for ISO/TC 145 to review the 11 proposed symbols, and if adopted, assign registration numbers and include the symbols on the ISO 7001- *Graphical symbols - Public information symbols* database.

The completed forms, together with this report, will now be submitted to BSI committee PH/8 (Graphical symbols) for forwarding to the secretariat of ISO/TC 145/SC 1 – Public information symbols.

If the review process is successful, ISO/TC 145 will assign ISO 7001 registration numbers, which can then be referenced in ISO/IEC JTC 1/SC 37 project ISO/IEC 24779 - ISO/IEC 24779-4 – *Biometrics – Cross-jurisdictional & societal aspects of implementation of biometric technologies – Pictograms, icons & symbols: Face*.

7. Observations, conclusions and recommendations

7.1 “Facial recognition” and Electronic passport symbol

The electronic passport (“ePassport”) symbol was not widely recognised or understood by respondents in both the SurveyMonkey or ISO 9186-1 tests. It was included in the symbols for “Manual passport control”, “Open passport” and “Wait”. This symbol is present on the covers of all new passports, and as the implementation of ePassports becomes more widespread, the travelling public will become more familiar with its significance. Consequently, it is recommended that this symbol is incorporated into the “Facial recognition” symbol which is intended to be used on wayfinding signs, and to specifically identify the actual ePassport facial recognition equipment station (“eGate”) as several of the respondents on the ISO 9186-1 tests believed that the candidate Facial recognition symbols addressed facial photography and surveillance, not necessarily biometric facial recognition. Seventy three (34.6%) of the responses categorised as 2a (Wrong) for these symbols recognised that a “camera” was involved.

7.2 “Do not smile” symbol

One hundred and three (49.5%) responses categorised as 2a (Wrong) for these symbols answered that they indicated “don’t talk”/“be silent”/“don’t laugh”. For the “closed mouth” symbol this involved 40 “wrong” responses and for the “open mouth” the larger amount of 63 “wrong” responses was recorded. No recommendations are made a result of this data.

7.3 “Wait” symbol

Twenty seven (12.6%) of the responses categorised as 2a (Wrong) for these symbols recognised that “time” was involved in the instruction, but did not recognise the scanner object. Consequently it is recommended that only the “hour glass” symbol is used here.

NOTE: The “Hourglass only” symbol was included in both SurveyMonkey tests, but came a close 3rd, so was excluded from the ISO test.

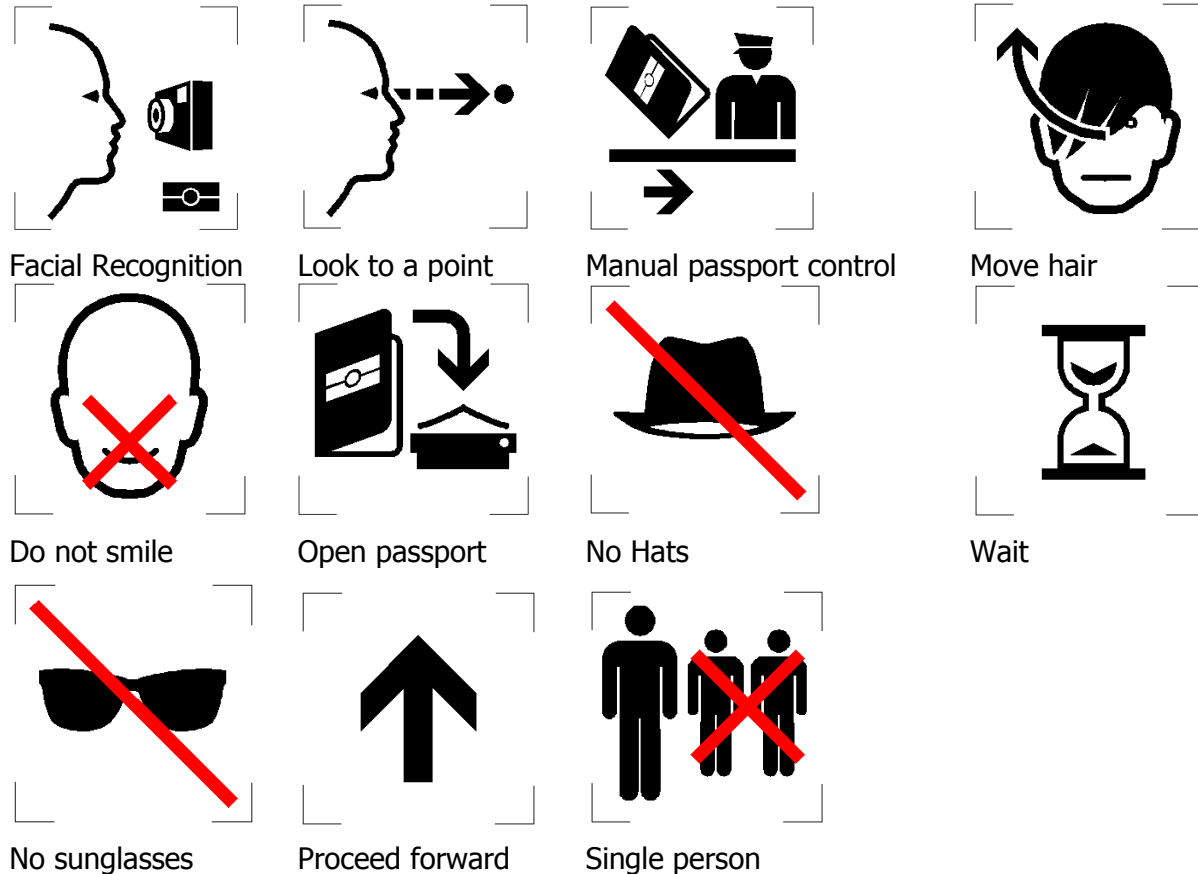
7.4 “No sunglasses” symbol

Fifty nine (27.4%) of the total responses for these symbols considered that it signified “remove spectacles” (i.e. prescription glasses); the remaining 75% responses interpreted it correctly. This was considered to be a correct response as the passengers would also remove sunglasses as a result of encountering this symbol.

7.5 “Single person” symbol

Forty three (20.2%) of the total responses for these symbols considered that it signified “single file” or “stand in a queue”. This was considered to be a correct response as the passengers would consequently carry out the correct action.

Consequently, the following set of 11 symbols will be submitted to ISO/TC 145/SC 1 for ISO adoption:



8. Accessibility

The following statement was prepared to address concerns regarding the accessibility of the symbols by disabled and elderly passengers.

8.1 Project background

The list of symbols identified are intended as a basic set and do not reflect a specific process, product or implementation. The symbols are intended to be used by sighted, independently-mobile passengers, without serious visual impairments.

Due to the nature of their usage (at international ports, airports and rail stations) it is necessary for text not to be incorporated within their design as this would require translation into global languages.

There is no provision in this project for guidance on aural or tactile alternatives to visual symbols; alternatives would be independently implemented by the product developer, manufacturer or supplier.

NOTE: Currently there are no internationally standardised or recognised guidelines for tactile symbols, although some research and development was undertaken as part of the European Telecommunications Standards Institute STF 286 Project: *Access symbols for use with video content and ICT devices* (see ETSI report ETSI TR 102 520 V1.1.2 (2006-11) - *Human Factors (HF)*;

...making excellence a habit.™

Access symbols for use with video content and ICT devices; Development and evaluation, available from <http://etsi.org/WebSite/homepage.aspx>).

8.2 The UK Equality Act 2010

Under the terms of this act, which replaced the 1995 Disability Discrimination Act, "it is unlawful for service providers to treat disabled people less favourably because they are disabled. The service provider must not indirectly discriminate against a disabled person unless there is a clear reason to do so.

Service providers have to make reasonable adjustments for disabled people in the way they deliver their services. This is so that a disabled person is not put at a substantial disadvantage compared to non-disabled people in accessing the services.

What is considered a reasonable adjustment for a large organisation, like a bank, may be different from a reasonable adjustment for a small local shop. It is about what is practical in the service provider's individual situation and what resources the business may have. They will not be required to make adjustments that are not reasonable because they are unaffordable or impractical."

For further information see

http://www.direct.gov.uk/en/disabledpeople/rightsandobligations/disabilityrights/dg_4001068

Furthermore, it is not intended that passengers with severe visual, mobility, muscular and cognitive impairments, will be encouraged to use biometric ePassport stations in the UK. Typically they will be greeted at the arriving aircraft or vessel and assisted through the conventional passport control process. In the instance of UK airports, alternative provisions are provided for people with disabilities.

More information on this is included under the headings "Rights of disabled persons at airports" and "UKBA Statement", below.

8.3 Review to ISO accessibility requirements for standards makers

A review of the FaceSymbol Project has been carried out to ISO Guide 71:2001 *Guidelines for standards developers to address the needs of older person and persons with disabilities*.

NOTE: ISO Guide 71 is the same as the CEN/CENELEC 6 which has the same content.

This review has been carried out using ISO Guide 71 Table 5 - *Factors to consider in clauses on the user interface*, specifically in conjunction with columns 9.2.1 (Seeing), 9.4.2/3 (Intellect/memory) and 9.4.4. (Language/literacy).

The symbols are being designed to be meaningful, with maximum contrast, restricted use of colour (choice, combinations and coding), simplicity of visual language and logical operation (consistency of design and re-use of visual metaphors).

8.4 Symbol design

The design of these symbols will be in accordance with ISO 22727:2007 - *Graphical symbols - Creation and design of public information symbols – Requirements*.

This standard prescribes the use of black and white images (maximum contrast), with red used only for negation by two specific geometric shapes...a full cell diagonal line (full symbol negation) and partial cell cross ("X") used for negation of subsidiary elements.

Within the design cell size of 70mm by 70mm, a minimum line thickness of 2mm is required. For the design of the symbols for this project this has been increased to 3mm.

8.5 Rights of disabled persons at UK airports

Under European law, disabled persons and persons with reduced mobility (PRM) have legal rights to assistance when travelling by air. This includes the provision of assistance from the terminal entrance to
...making excellence a habit.™

the aircraft and vice versa. Any disabled person will therefore be provided with assistance to pass through immigration.

These links provide further information:

http://www.direct.gov.uk/en/DisabledPeople/TravelHolidaysAndBreaks/GettingThere/DG_4017242

<http://www.equalityhumanrights.com/advice-and-guidance/service-users-guidance/air-travel/>

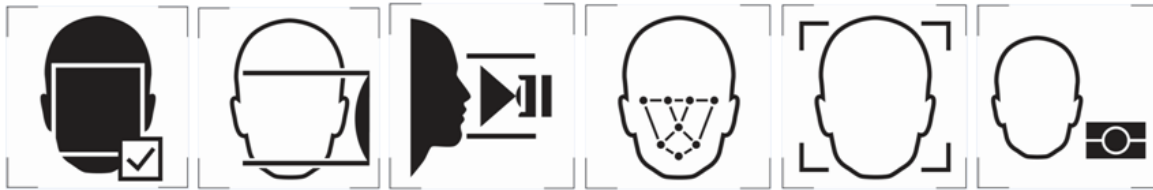
8.6 UKBA statement (2012-05-22)

"While all EEA nationals over the age of 18 in possession of a chipped and valid EEA national passport may seek to use the eGates, all UK airport terminals offer alternative dedicated routes for disabled passengers. Although some wheelchair users can access the eGates, manoeuvring into the range of the facial recognition cameras may prove difficult. The presence and assistance of eGate Hosts may prove useful to other disabled passengers, but in general, they will usually benefit from the dedicated clearance routes.

UKBA will endeavour to ensure that in future installations a proportion of eGates will be Disability Discrimination Act compliant. UKBA have not encountered any issues with users suffering from tremors using the gates, but they provide a dedicated officer at or near the gates to deal with passengers who are unable to complete the gate transaction.

UKBA are currently reviewing their position on the age limit of eGate users and this may be lowered in future."

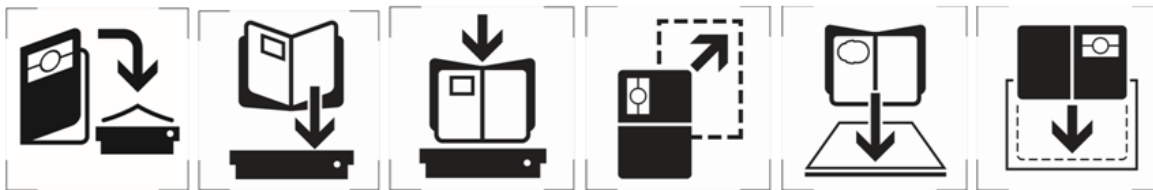
9. Annex A - First set of symbols for "SurveyMonkey" review by Project Team



FaceRec A FaceRec B FaceRec C FaceRec D FaceRec E FaceRec F



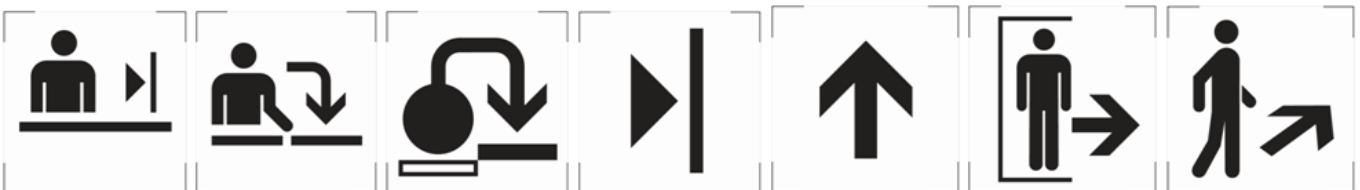
Single Person A Single Person B Single Person C Single Person D Single Person E Single Person F Single Person G



Open Passport A Open Passport B Open Passport C Open Passport D Open Passport E Open Passport F



Wait A Wait B Wait C Wait D Wait E Wait F



Proceed A Proceed B Proceed C Proceed D Proceed E Proceed F Proceed G



Manual Passport A Manual Passport B Manual Passport C Manual Passport D Manual Passport E



Remove Hat A Remove Hat B Remove Hat C Remove Hat D Remove Hat E Remove Hat F



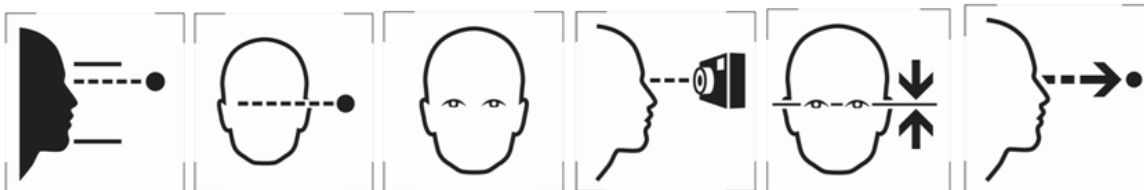
Remove Sunglasses A Remove Sunglasses B Remove Sunglasses C Remove Sunglasses D Remove Sunglasses E



No Smile A No Smile B No Smile C No Smile D No Smile E No Smile F No Smile G



Move hair A Move hair B Move hair C Move hair D Move hair E Move hair F Move hair G



Look to a point A Look to a point B Look to a point C Look to a point D Look to a point E Look to a point F

10. Annex B - Second set of symbols for "SurveyMonkey" review by Project team

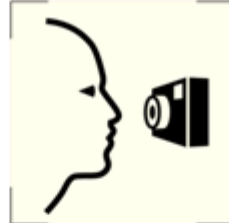
1. Face recognition



A (4th draft b)



New E (4th draft b)



New D (4th draft b)



C (4th draft b)

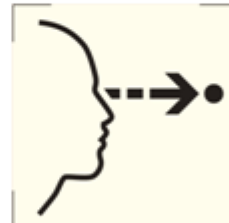
2. Look to a point



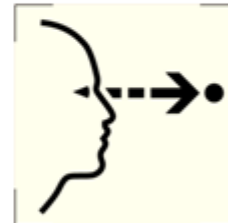
D (4th draft b)



D (3rd draft)



F (3rd draft)



F (4th draft b)

3. Go to manual passport control



A (3rd draft)



New F (4th draft b)



New G (4th draft b)



C (3rd draft)

4. Move hair away from face



New H (4th draft b)



E (3rd draft)



H (3rd draft)

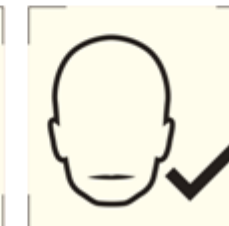
5. Do not smile



New H (4th draft b)



D (3rd draft b)



E (3rd draft b)



New I (4th draft b)

6. Open passport and place on/in scanner



New G (4th draft b)



A (4th draft b)



B (4th draft b)

7. Proceed ...no re-testing planned

8. Remove hat



F (4th draft B)



New G (4th draft b)



E (3rd draft b)



New H (4th draft b)

9. Single person...no re-testing planned

10. Wait while passport is processed



C (3rd draft c)



E (3rd draft c)



F (4th draft b)



G (4th draft b)

11. Remove sunglasses



D (4th draft b)



E (4th draft b)



C (3rd draft c)

11. Annex C - Examples of ISO 9186-1 test pages

1. Symbol Comprehension Test – Instruction sheet

To the test administrator: Please read this information to the passenger or allow them to read it for themselves.

Instructions:

We would like you to help us evaluate some proposed symbols (pictograms). We want to see how well these symbols are understood. You will be helping us do this by writing down what you think each symbol means. Alternatively you can tell the administrator and they will write it down for you.

On each page we will show you a symbol and tell you where you might find it. (For example: 'You are at a beach, swimming pool or swimming area and you see this symbol'.) Read this context information before making your response.

- Symbols on a yellow background are warning symbols.
- Symbols on a green background indicate a safety message.
- Symbols on a blue background indicate an instruction.
- Symbols with a red diagonal bar or "X" indicate prohibited actions.

It is very important that you write down what, according to you, the symbol means. If your answer is too vague or general, we will not be able to determine if the correct message is getting across.

- There is a space for you to write down what you think the symbol means
- Some symbols may suggest you should do or should not do something. So there is another blank space where you can write down the action that you should take in response to the symbol. (You can leave this space empty if you do not think the symbol indicates you should do or refrain from doing something.)

Some of the symbols may be easy and some may be difficult to understand. Just do the best you can for each of the symbols. If you can't figure out what a symbol means, write down "don't know". Please do not just leave a blank.

It is important you work alone. Do not talk to anyone or make comments out loud.

There is no time limit, but try not to spend too much time on each symbol. Once you finish a page do not go back over it, but do feel free to look at these instructions again at any time.

Remember, it is the symbols that are being tested not you.

The next page asks you for some information about yourself. Please do not give your name. The page after that is an example sheet showing a graphical symbol and written below it a person's response showing what she thinks it means. The test pages come after the example sheet.

Thank you for taking part in this study.

2. Symbol Comprehension Test – Respondent self-report page

This is a study of the meaning of symbols meant for the general population. We would like to know how far the people responding to the symbols reflect the population of the country, and so would be grateful if you would provide a little information about yourself. You are of course free to refuse to answer any of these questions if you do not wish to give the information. Please do NOT give your name: the responses are entirely anonymous.

Date: Test administrator:

Age (please put a tick against whichever age group you are in):

15 – 30

31 – 50

over 50

Sex (please put a tick to show which sex you are): Male Female

Nationality:

Educational level (please put a tick against whichever one alternative best describes the level of education you completed):

Did you leave school at the normal school-leaving age?

Do you have a post-school qualification which is not degree level?

Do you have a degree or degree equivalent?

Comprehension Test - **Symbol 7**



Symbol 7

Symbol 7 appears in airports, ports and international rail stations.

You might find it on an instruction sign at an electronic passport station.

What do you think this symbol means?

.....

What action should you take in response to this symbol?

.....

12. Bibliography - Symbol sources researched

1. Biometric symbol design for the public - case studies in the United States and four Asian countries, *Yee-Yin Choong, Brian Stanton, and Mary Theofanos* National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899, USA.
2. ISO/IEC 11581-3:2000 - Information technology - User system interfaces and symbols - Icon symbols and functions - Part 3: Pointer icons (*ISO/IEC JTC 1/SC 35/WG 2 - User Interfaces – Icon symbols and functions*)
3. ISO/IEC JTC 1/SC 37 N4274 Text of Working Draft ISO/IEC 24779-1, Biometrics — Cross-jurisdictional and societal aspects of implementation of biometric technologies – Pictograms, Icons and Symbols for Use with Biometric Systems – Part 1: Overview (2011-01-13)
4. ISO/IEC JTC 1/SC 37 N2603, US Contribution1 to ISO/IEC JTC1 SC37 WG 6, 24779: Pictograms, Icons and Symbols for use with Biometric Systems
5. ISO/IEC JTC 1/SC 37 Biometrics, N 3090, Contribution from the United States National Body on SC37/WG6 SG for Icons and Symbols for Use in Biometric Systems (2009-03-13)
6. NISTIR 7645, Symbols Representing Biometrics in Use, *Yee-Yin Choong, Mary Theofanos, Brian Stanton, Information Access Division, Information Technology Laboratory, National Institute of Standards and Technology, Gaithersburg, MD 20899 & Patrick Hofmann designpH, Toronto London Sydney*
7. ISO/IEC 13251: 2004 - Collection of graphical symbols for office equipment (*ISO/IEC JTC 1/SC 35/WG 2 - User Interfaces – Icon symbols and functions*)
8. ISO Concepts database/ ISO 7000:2004 -Graphical symbols for use on equipment - Index and synopsis (*ISO/TC 145/SC 3 - Graphical symbols for use on equipment*)
9. ISO 7001:2007 - *Graphical symbols - Public information symbols (TC 145/SC 1 - Public information symbols)*
10. ISO/IEC 18035:2003 - Information technology - Icon symbols and functions for controlling multimedia software applications (*ISO/IEC JTC 1/SC 35/WG 2 - User Interfaces – Icon symbols and functions*)
11. BS 8502:2003 - Graphical symbols and signs - Creation and design of public information symbols – Requirements
12. JAPANESE INDUSTRIAL STANDARD JIS T 010:2005 - Design principles of pictorial symbols for communication support
13. ISO 15223-1:2007 - Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General requirements (*contains a collection of standardised symbols*)
14. BS 8501:2002 - Graphical symbols and signs. Public information symbols
15. ISO/IEC 11581-2:2000 - Information technology - User system interfaces and symbols - Icon symbols and functions - Part 2: Object icons
16. ISO/IEC 11581-5:2004 - Information technology - User system interfaces and symbols - Icon

symbols and functions - Part 5: Tool icons

17. ISO/IEC 11581-6:1999 - Information technology - User system interfaces and symbols - Icon symbols and functions - Part 6: Action icons
18. ISO 15223-1:2007 - Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General requirements (*contains a collection of standardised symbols*)
19. Foundation for Promoting Personal Mobility and Ecological Transportation/Japanese Guidelines for Public Information Symbols (http://www.ecomo.or.jp/english/picto_about.html)
20. Standard symbols for use in airports by the American Institute of Graphic Arts for the U.S. Department of Transportation
21. SAFRAN Morpho...provided by Gillian Ormiston at FaceSymbol Workshop (2011-10-13)
22. Provided by Gillian Ormiston
23. National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899, USA.

Revision History

Revision No.	Date	Author	Approved By	Changes