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**Technical Assessment Body issuing the European Technical Assessment: UBAtc.
UBAtc has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)**

Trade name of the construction product:	3M™ High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170
Product family to which the construction product belongs:	Micro-prismatic retro-reflective sheeting for traffic signs
Manufacturer:	3M Deutschland GmbH Carl Schurz Strasse 1 D- 41453- Neuss - Deutschland
Manufacturing plants:	3M Deutschland GmbH Plant Hilden, Düsseldorfer Str. 121-125 D-40705 Hilden Germany 3M Brownwood 4501 Highway 377 South Brownwood, Texas 76801 USA
Website:	www.mmm.com
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	European Assessment Document (EAD): EAD 120001-01-0106, September 2016
This European Technical Assessment contains:	11 pages, including 1 annex which forms an integral part of the document.

European Organisation for Technical Assessment

Legal bases and general conditions

1 This European Technical Assessment is issued by UBAtc (Union belge pour l'Agrément technique de la construction, i.e. Belgian Union for technical Approval in construction), in accordance with:

- Regulation (EU) No 305/2011[1] of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC
- Commission Implementing Regulation (EU) No 1062/2013[2] of 30 October 2013 on the format of the European Technical Assessment for construction products
- European Assessment Document (EAD) : 120001-01-0106

2 Under the provisions of Regulation (EU) No 305/2011, UBAtc is not authorized to check whether the provisions of this European Technical Assessment are met once the ETA has been issued.

3 The responsibility for the conformity of the performances of the products with this European Technical Assessment and the suitability of the products for the intended use remains with the holder of the European Technical Assessment.

4 Depending on the applicable Assessment and verification of constancy of performance (AVCP) system, (a) notified body(ies) may carry out third-party tasks in the process of assessment and verification of constancy of performance under this Regulation once the European Technical Assessment has been issued.

5 This European Technical Assessment allows the manufacturer of the construction product covered by this ETA to draw up a declaration of performance for the construction product.

6 CE marking should be affixed to all construction products for which the manufacturer has drawn up a declaration of performance.

7 This European Technical Assessment is not to be transferred to other manufacturers, agents of manufacturers, or manufacturing plants other than those indicated on page 1 of this European Technical Assessment.

8 The European Technical Assessment holder confirms to guarantee that the product(-s) to which this assessment relates, is/are produced and marketed in accordance with and comply with all applicable legal and regulatory provisions, including, without limitation, national and European legislation on the safety of products and services. The ETA-holder shall notify the UBAtc immediately in writing of any circumstance affecting the aforementioned guarantee. This assessment is issued under the condition that the aforementioned guarantee by the ETA-holder will be continuously observed.

9 According to Article 11(6) of Regulation (EU) No 305/2011, when making a construction product available on the market, the manufacturer shall ensure that the product is accompanied by instructions and safety information in a language determined by the Member State concerned which can be easily understood by users. These instructions and safety information should fully correspond with the technical information about the product and its intended use which the manufacturer has submitted to the responsible Technical Assessment Body for the issuing of the European Technical Assessment.

10 Pursuant to Article 11(3) of Regulation (EU) No 305/2011, manufacturers shall adequately take into account changes in the product-type and in the applicable harmonised technical specifications. Therefore, when the contents of the issued European Technical Assessment do not any longer correspond to the product-type, the manufacturer should refrain from using this European Technical Assessment as the basis for their declaration of performance.

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13 Subject to the application introduced, this European Technical Assessment is issued in English and may be issued by the UBAtc in its official languages. The translations correspond fully to the English reference version circulated in EOTA.

14 This European Technical Assessment was first issued by UBAtc on: 2017-07-26.

[1] OJEU, L 88 of 2011/04/04

[2] OJEU, L 289 of 2013/10/31

Technical Provisions

1 Description of the construction product

1.1 General

The product consists in a micro-prismatic retro-reflective sheeting made of optical prismatic lenses elements formed in a transparent synthetic resin, sealed and backed with a pressure sensitive adhesive to form a durable bond to the sign substrates. The sheeting has a smooth surface with a distinctive interlocking seal pattern and may or may not have orientation marks, visible from the face.

The product is supplied as "3M High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170".

1.2 Components of "3M High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170"

The complete set of Micro-prismatic retro-reflective sheeting is given in table 1.1. The mixing ratio of the Piezo Inkjet Ink for the various traffic colours has been deposited with UBAtc.

The manufacturer's specification of the initial daylight chromaticity and luminance factor is given in table 1.2 by means of a colour box in the 1931 CIE (2°) system.
The manufacturer's specification of the daylight chromaticity and luminance factor 'in-use' (or after the durability test) is given in table 1.3 by means of a colour box in the 1931 CIE (2°) system.

Components	Trade name	Colours/code	Characteristics
Micro-prismatic retro-reflective sheeting	3M™ High Intensity Prismatic Digital Sheeting 3930DS	White 3930DS	Nominal Thickness: 0.3 mm Rolls in various length and widths
Process Colour for digital printing	3M™ Piezo Inkjet Ink Series 8800UV or 8900 UV*	Yellow Red Blue Green Orange Brown Grey Dark Green	18-20 mg/l
3M™ Protective Overlay Film		Clear 1170	Combined Nominal Thickness: 0,45 mm

* 3M Piezo Ink Jet Ink Series 8800 UV or 8900 UV are variations of the same basic ink formulations. The difference between Series 8800 and 8900 are the dispersant and stabilizer packages to make the ink suitable for the different printer models and printheads. The curable components are identical. 3M markets both ink series as equal alternatives with the same performances.

Table 1.1: Complete set of Micro-prismatic retro-reflective sheeting covered by this ETA

Colours		Chromaticity Coordinates 1	2	3	4	Luminance Factor ß
White	x	*0.305*	*0.335*	*0.325*	*0.295*	*≥ 0.40*
Tolerance Sphere	y	*0.315*	*0.345*	*0.355*	*0.325*	
Yellow	x	*0.494*	*0.470*	*0.513*	*0.545*	*≥ 0.24*
Tolerance Sphere	y	*0.505*	*0.480*	*0.437*	*0.454*	
Red	x	*0.735*	*0.700*	*0.610*	*0.660*	*≥ 0.03*
Tolerance Sphere	y	*0.265*	*0.250*	*0.340*	*0.340*	
Blue	x	*0.130*	*0.160*	*0.160*	*0.130*	*≥ 0.01*
Tolerance Sphere	y	*0.090*	*0.090*	*0.140*	*0.140*	
Green	x	*0.110*	*0.170*	*0.170*	*0.110*	*≥ 0.03*
Tolerance Sphere	y	*0.415*	*0.415*	*0.500*	*0.500*	
Orange	x	0.631	0.560	0.506	0.570	*≥ 0.14*
Tolerance Sphere	y	0.369	0.360	0.404	0.429	
Brown	x	*0.455*	*0.523*	*0.479*	*0.558*	*0.03-0.09*
Tolerance Sphere	y	*0.397*	*0.429*	*0.373*	*0.394*	
Grey	x	*0.305*	*0.335*	*0.325*	*0.295*	*0.11-0.18*
Tolerance Sphere	y	*0.315*	*0.345*	*0.355*	*0.325*	
Dark Green	x	*0.313*	*0.313*	*0.248*	*0.127*	*0.01-0.07*
Tolerance Sphere	y	*0.682*	*0.453*	*0.409*	*0.557*	

Table 1.2: Manufacturer's specification for initial daylight chromaticity and luminance factor

Colours		Chromaticity Coordinates				Luminance Factor ß
		1	2	3	4	
White *Tolerance Sphere*	x y	0.355 0.355	0.305 0.305	0.285 0.325	0.335 0.375	*≥ 0.40*
Yellow *Tolerance Sphere*	x y	0.545 0.454	0.487 0.423	0.427 0.483	0.465 0.534	*≥ 0.24*
Red *Tolerance Sphere*	x y	0.735 0.265	0.674 0.236	0.569 0.341	0.655 0.345	*≥ 0.03*
Blue *Tolerance Sphere*	x y	0.078 0.171	0.150 0.220	0.210 0.160	0.137 0.038	*≥ 0.01*
Green Tolerance Sphere	x y	0.007 0.703	0.248 0.409	0.177 0.362	0.026 0.399	*≥ 0.03*
Orange *Tolerance Sphere*	x y	0.631 0.369	0.560 0.360	0.506 0.404	0.570 0.429	*≥ 0.14*
Brown *Tolerance Sphere*	x y	*0.455* *0.397*	*0.523* *0.429*	*0.479* *0.373*	*0.558* *0.394*	*0.03-0.09*
Grey Tolerance Sphere	x y	0.350 0.360	0.300 0.310	0.285 0.325	0.335 0.375	*0.11-0.18*
Dark Green *Tolerance Sphere*	x y	*0.313* *0.682*	*0.313* *0.453*	*0.248* *0.409*	*0.127* *0.557*	*0.01-0.07*

Table 1.3: Manufacturer's specification for daylight chromaticity and luminance factor 'in-use'

2 Information on the intended use of the construction product

2.1 Intended uses

The construction product is used to manufacture sign faces for traffic signs.

The intended use includes, for example:
- retro-reflective signs,
- retro-reflective and trans-illuminated signs,
- trans-illuminated traffic bollards,
- road delineators with retro-reflective devices,
- variable message signs.

The envisaged substrates or structures are commonly, but not only, based on aluminium, galvanised steel or processed polymers. The test specimens for this ETA have been prepared on smooth aluminium panels, according to EAD 120001-01-0106, Annex 1.

The assumed intended working life of the product is 10 years, provided that it is subjected to appropriate use and maintenance. The indications given as to the working life of the product cannot be interpreted as a guarantee given by the manufacturer or by the Technical Assessment Body.

2.2 Assumptions under which the fitness of the product(s) for the intended use was favourably assessed

2.2.1 Manufacturing directives

The "3M High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170", shall correspond, as far as their composition and manufacturing process is concerned, to the products subject to the assessment tests. A manufacturing process has been deposited with UBAtc.

2.2.2 Installation

2.2.2.1 General

It is the responsibility of the ETA holder to guarantee that the information about design and installation of the systems as described in clause 1.1 of this ETA, are effectively communicated to the concerned people. This information can be given using reproductions of the respective parts of this ETA. Besides, all the data concerning the execution shall be indicated clearly on the packaging and or the enclosed instruction sheets using one or several illustrations.

In any case, it is suitable to comply with national regulations and particularly concerning national traffic code.

Only the components described in clause 1.1 of this ETA may be used for the systems "3M High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170"

2.2.2.2 Design

Users are urged to carefully evaluate all substrates for adhesion and sign durability. "3M™ High Intensity Prismatic Digital Sheeting 3930DS" is designed primarily for application to flat substrates.

2.2.2.3 Application

"3M™ High Intensity Prismatic Digital Sheeting 3930DS"

The recognition and preparation of the substrate as well as the generalities about the application of this product series, which is fully described in the current version of the ETA holder catalogue, its technical bulletins and web site www.3M.com/TSS, shall be carried out in compliance with national regulations, if any.

"3M™ High Intensity Prismatic Digital Sheeting 3930DS" incorporates a pressure sensitive adhesive and shall be applied to the sign substrate at room temperature (18°C) or higher by any of the following methods: mechanical squeeze roll applicator, hand squeeze roll applicator, hand application. If the heater is needed to warm to the minimum application temperature of 18°C, it must be directed at the substrate only.

Users are urged to carefully evaluate all substrates for adhesion and sign durability. "3M™ High Intensity Prismatic Digital Sheeting 3930DS" is designed primarily for application to flat substrates. Sign failures caused by the substrate due to improper surface preparation are not the responsibility of the ETA holder.

3M™ Piezo Inkjet Ink Series 8800 UV or 8900 UV

3M Piezo Ink Jet Ink Series 8800 UV or 8900 UV are designed as part of the 3M MCS™ (Matched Component System) for application using the Durst Rho 161TS / 162TS / 163 and EFI H1625RS Printer onto 3M High Intensity Prismatic Digital Sheeting 3930DS before mounting the sheeting onto a sign substrate. These UV-curable inks are durable, weather-resistant, and have excellent colour retention when used in combination with 3M Protective Overlay Film 1170 as an overlaminate.

Detailed printing guidelines in order to achieve traffic sign colours according to this ETA can be obtained in the latest Product Bulletin for 3M Piezo Ink Jet Ink Series 8800UV or 8900UV.

Above mentioned overlaminates must always be applied, following below instructions:

To avoid a silvering artefact (trapped air between ink layer and overlaminate), the lamination process should be conducted under a controlled set of conditions.

Recommended laminator specifications and set-up:
- Roll diameter: max. 350 mm; Roll weight: approximately 80 kg; Roll width: 1400-1600 mm
- Core size: 3 inches; 2 Take-up shafts; 2 Supply shafts
- Heatable top roller: min. 45°C; Pressure: > 8 bar

3M Piezo Ink Jet Ink should not be stored at elevated temperatures. It must be used within the indicated shelf life.

2.3 Recommendations

2.3.1 Recommendations on packaging, transport and storage

The sheeting must be stored in a cool, dry area, preferably at 18-24°C and 30-50% RH, and should be applied within one year from delivery. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally on a rod or pipe through the core.

Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge.

Package for shipment must prevent movement and chafing. Store sign packages indoors on edges. Panels or finished signs must remain dry during shipping and storage. If packaged signs become wet, unpack immediately and allow to dry.

3 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

3.1 3M High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170

3.1.1 Daylight Chromaticity and Luminance Factor

The characteristics of initial daylight chromaticity and luminance factor have been determined according to EAD120001-01-0106, clause 2.2.1 and have been specified in Annex 1, clause 1.1, of this ETA.

3.1.2 Night-time colour

No performance assessed.

3.1.3 Coefficient of Retro-reflection

The Coefficient of Retro-reflection has been determined according to EAD120001-01-0106, clause 2.2.3. The rotation angle ε has been set to 0° according to the manufacturer's specification. The result of the test is given as average of three samples.

Geometry of measurements		Colour								
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Blue	Green	Orange	Brown	Grey	Dark Green
12'	+5°	953	285	99	80	61	228	79	427	56
	+30°	423	142	50	36	28	112	39	210	26
	+40°	290	94	32	25	19	73	26	146	17
20'	+5°	621	245	85	63	51	193	67	306	47
	+30°	279	110	36	30	24	85	29	141	21
	+40°	152	64	21	16	13	49	17	84	11
2°	+5°	11	8	2,7	0,8	1,4	5,4	2,2	5,4	1,6
	+30°	4,4	6,1	2,1	0,6	1,0	4	1,7	2,8	1,2
	+40°	3,4	5,7	2,0	0,5	0,9	3,8	1,6	2,5	1,0

3.1.4 Rotational symmetry

The rotational symmetry has been determined according to EAD120001-01-0106, clause 2.2.3 “rotational symmetry”.

White Rotational symmetry	
#	Ratio
Sample 1	1 : 1,31
Sample 2	1: 1,27
Sample 3	1: 1,30

Yellow Rotational symmetry	
#	Ratio
Sample 1	1 : 1,05
Sample 2	1: 1,06
Sample 3	1: 1,32

Red Rotational symmetry	
#	Ratio
Sample 1	1 : 1,07
Sample 2	1: 1,08
Sample 3	1: 1,09

Blue Rotational symmetry	
#	Ratio
Sample 1	1 : 1,07
Sample 2	1: 1,15
Sample 3	1: 1,08

Green Rotational symmetry	
#	Ratio
Sample 1	1 : 1,04
Sample 2	1: 1,07
Sample 3	1: 1,05

Orange Rotational symmetry	
#	Ratio
Sample 1	1 : 1,04
Sample 2	1: 1,06
Sample 3	1: 1,09

Brown Rotational symmetry	
#	Ratio
Sample 1	1 : 1,06
Sample 2	1: 1,07
Sample 3	1: 1,05

Grey Rotational symmetry	
#	Ratio
Sample 1	1 : 1,17
Sample 2	1: 1,26
Sample 3	1: 1,30

Dark Green Rotational symmetry	
#	Ratio
Sample 1	1 : 1,02
Sample 2	1: 1,05
Sample 3	1: 1,08

3.1.5 Impact resistance

The Impact resistance has been determined according to EAD120001-01-0106, clause 2.2.4.

Sample	Test Result
White	No apparent cracking or delamination observed
Yellow	
Red	
Blue	
Green	
Orange	
Brown	
Grey	
Dark Green	

3.1.6 Temperature resistance

No performance assessed

3.1.7 Visibility after weathering

The artificial weathering has been done according to EAD 120001-01-0106, clause 2.2.6.1, with the use of a (non-insulated) black-panel thermometer. The size of the specimens is (5,5 x 10) cm.

3.1.7.1 Daylight Chromaticity and Luminance Factor after accelerated artificial weathering

The daylight chromaticity and luminance factor, verified according to EAD120001-01-0106, clause 2.2.1, tested after accelerated artificial weathering test, have been specified in Annex 1, clause A1.2 of this ETA.

3.1.7.2 Coefficient of Retro-reflection after accelerated artificial weathering

The Coefficient of Retro-reflection after accelerated artificial weathering tests has been determined according to EAD 120001-01-0106, clause 2.2.6.4, with an observation angle α = 0.33° and $\beta 1$= 5° and 30°. The rotation angle ε has been set to 0° according to the manufacturer's specification.

The result of the test is given as average of three samples.

Colours	Geometry of Measurements	
	α = 0,33° /$\beta 1$ = 5°	α = 0,33° /$\beta 1$ = 30°
White	594	242
Yellow	275	118
Red	91	36
Blue	71	32
Green	59	26
Orange	219	94
Brown	77	31
Grey	337	149
Dark Green	59	25

3.1.8 Visibility after natural weathering

No performance assessed

3.1.9 Adhesion

No performance assessed

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with Regulation (EU) N° 305/2011, Article 65, Directive 89/106/EEC is repealed, but references to the repealed Directive shall be construed as references to the Regulation.

The system of assessment and verification of constancy of performance, specified in the Decision of the Commission 1996/579/EC of 1996/06/24[3], as amended by Commission Decision 1999/453/EC of 1999/06/18[4], is specified in the following Table.

Table 2 – System of assessment and verification of constancy of performance

Product(s)	Intended use(s)	Level(s) or class(es)	Assessment and verification of constancy of performance system(s)*
Road traffic signs	For circulation areas	Any	1
* See Annex V to Regulation (EU) N° 305/2011			

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

5.1 Tasks for the ETA-holder

The cornerstones of the actions to be undertaken by the manufacturer of the product in the process of assessment and verification of constancy of performance are laid down in clause 3.2 of the European Assessment Document 120001-01-0106.

The manufacturer is allowed to use similar test or control methods, using different equipment and test samples under different conditions, as long as the manufacturer ensures constant product performances, but the frequency of control shall be respected.

5.2 Tasks of notified bodies

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance are laid down in clause 3.3 of the European Assessment Document 120001-01-0106.

6 Reference documents

See clause 4 of the European Assessment Document 120001-01-0106.

NOTE: The editions of reference documents given above are those which have been adopted by the UBAtc for its specific use when establishing this ETA. When new editions become available, these supersede the editions mentioned only when confirmed by the UBAtc.

UBAtc asbl is a non-profit organization according to Belgian law. It is a Technical Assessment Body notified by the Belgian notifying authority, the Federal Public Services Economy, SMEs, Self-Employed and Energy, on 17 July 2013 in the framework of Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC and is member of the European Organisation for Technical Assessment, EOTA (www.eota.eu).

This European Technical Assessment has been issued by UBAtc asbl on the basis of the technical work carried out by the Assessment Operator, COPRO.

On behalf of UBAtc asbl,

Peter Wouters, director

Benny De Blaere, director

On behalf of the Assessment Operator, COPRO, responsible for the technical content of the ETA,

Dirk Van Loo, CEO COPRO

The most recent version of this European Technical Assessment may be consulted on the UBAtc website (www.ubatc.be).

[3] see OJEU L 254, 8.10.1996, p. 52

[4] see OJEU L 178, 14.7.1999, p. 50

Annex 1: 3M High Intensity Prismatic Digital Sheeting 3930DS + 3M™ Piezo Inkjet Ink + 3M™ Protective Overlay Film 1170
Daylight Chromaticity and Luminance Factor, initial and after accelerated artificial weathering

A 1.1 Daylight Chromaticity and Luminance Factor, initial

Colours		Chromaticity Coordinates				Luminance Factor ß
		1	2	3	4	
White	***x***	***0.305***	***0.335***	***0.325***	***0.295***	***≥ 0.40***
Tolerance Sphere	***y***	***0.315***	***0.345***	***0.355***	***0.325***	
White Sample 1	x	0.315				0.44
	y	0.332				
White Sample 2	x	0.316				0.43
	y	0.333				
White Sample 3	x	0.315				0.44
	y	0.333				
Yellow	***x***	***0.494***	***0.470***	***0.513***	***0.545***	***≥ 0.24***
Tolerance Sphere	***y***	***0.505***	***0.480***	***0.437***	***0.454***	
Yellow Sample 1	x	0.481				0.28
	y	0.474				
Yellow Sample 2	x	0,476				0,28
	y	0,474				
Yellow Sample 3	x	0,481				0,27
	y	0,486				
Red	***x***	***0.735***	***0.700***	***0.610***	***0.660***	***≥ 0.03***
Tolerance Sphere	***y***	***0.265***	***0.250***	***0.340***	***0.340***	
Red Sample 1	x	0.630				0.07
	y	0.331				
Red Sample 2	x	0.625				0.07
	y	0.332				
Red Sample 3	x	0.637				0.07
	y	0.331				
Blue	***x***	***0.130***	***0.160***	***0.160***	***0.130***	***≥ 0.01***
Tolerance Sphere	***y***	***0.090***	***0.090***	***0.140***	***0.140***	
Blue Sample 1	x	0.141				0.04
	y	0.130				
Blue Sample 2	x	0.146				0.06
	y	0.139				
Blue Sample 3	x	0.141				0.05
	y	0.129				
Green	***x***	***0.110***	***0.170***	***0.170***	***0.110***	***≥ 0.03***
Tolerance Sphere	***y***	***0.415***	***0.415***	***0.500***	***0.500***	
Green Sample 1	x	0.169				0.06
	y	0.438				
Green Sample 2	x	0.166				0.05
	y	0.476				
Green Sample 3	x	0.160				0.06
	y	0.448				
Orange	***x***	***0.631***	***0.560***	***0.506***	***0.570***	***≥ 0.14***
Tolerance Sphere	***y***	***0.369***	***0.360***	***0.404***	***0.429***	
Orange Sample 1	x	0.546				0.16
	y	0.404				
Orange Sample 2	x	0.544				0.15
	y	0.407				
Orange Sample 3	x	0.527				0.16
	y	0.397				
Brown	***x***	***0.455***	***0.523***	***0.479***	***0.558***	***0.03-0.09***
Tolerance Sphere	***y***	***0.397***	***0.429***	***0.373***	***0.394***	
Brown Sample 1	x	0.524				0.05
	y	0.402				
Brown Sample 2	x	0.515				0,05
	y	0.396				

Colours		Chromaticity Coordinates				Luminance Factor ß
		1	2	3	4	
Brown Sample 3	x y	0,523 0.394				0,04
Grey Tolerance Sphere	***x*** ***y***	***0.305*** ***0.315***	***0.335*** ***0.345***	***0.325*** ***0.355***	***0.295*** ***0.325***	***0.11-0.18***
Grey Sample 1	x y	0.321 0.336				0.16
Grey Sample 2	x y	0.321 0.336				0.15
Grey Sample 3	x y	0.323 0.338				0.14
Dark Green Tolerance Sphere	***x*** ***y***	***0.313*** ***0.682***	***0.313*** ***0.453***	***0.248*** ***0.409***	***0.127*** ***0.557***	***0.01-0.07***
Dark Green Sample 1	x y	0.233 0.501				0.06
Dark Green Sample 2	x y	0.212 0.561				0.06
Dark Green Sample 3	x y	0.250 0.535				0.05

A 1.2 Daylight Chromaticity and Luminance Factor, after accelerated artificial weathering

Colours		Chromaticity Coordinates 1	2	3	4	Luminance Factor ß
White Tolerance Sphere	**x** **y**	**0.355** **0.355**	**0.305** **0.305**	**0.285** **0.325**	**0.335** **0.375**	***≥ 0.40***
White Sample 1	x y	0.316 0.333				*0.45*
White Sample 2	x y	0.317 0.335				*0.45*
White Sample 3	x y	0.316 0.333				*0.45*
Yellow Tolerance Sphere	***x*** ***y***	**0.545** **0.454**	**0.487** **0.423**	**0.427** **0.483**	**0.465** **0.534**	***≥ 0.24***
Yellow Sample 1	x y	0.476 0.474				*0.29*
Yellow Sample 2	x y	0.467 0.474				*0.28*
Yellow Sample 3	x y	0.474 0.479				*0.28*
Red Tolerance Sphere	***x*** ***y***	**0.735** **0.265**	**0.674** **0.236**	**0.569** **0.341**	**0.655** **0.345**	***≥ 0.03***
Red Sample 1	x y	0.615 0.332				*0.07*
Red Sample 2	x y	0.601 0.333				*0.07*
Red Sample 3	x y	0.619 0.334				*0.06*
Blue Tolerance Sphere	***x*** ***y***	**0.078** **0.171**	**0.150** **0.220**	**0.210** **0.160**	**0.137** **0.038**	***≥ 0.01***
Blue Sample 1	x y	0.145 0.152				*0.04*
Blue Sample 2	x y	0.149 0.151				*0.06*
Blue Sample 3	x y	0.142 0.137				*0.05*
Green Tolerance Sphere		**0.007** **0.703**	**0.248** **0.409**	**0.177** **0.362**	**0.026** **0.399**	***≥ 0.03***
Green Sample 1	x y	0.174 0.423				*0.06*
Green Sample 2	x y	0.174 0.459				*0.06*
Green Sample 3	x y	0.170 0.438				*0.07*
Orange Tolerance Sphere	***x*** ***y***	**0.631** **0.369**	**0.560** **0.360**	**0.506** **0.404**	**0.570** **0.429**	***≥ 0.14***
Orange Sample 1	x y	0.535 0.406				*0.16*
Orange Sample 2	x y	0.529 0.411				*0.16*
Orange Sample 3	x y	0.525 0.403				*0.16*
Brown Tolerance Sphere	***x*** ***y***	***0.455*** ***0.397***	***0.523*** ***0.429***	***0.479*** ***0.373***	***0.558*** ***0.394***	***0.03-0.09***
Brown Sample 1	x y	0.509 0.400				*0.06*
Brown Sample 2	x y	0.494 0.395				*0.06*
Brown Sample 3	x y	0.506 0.397				*0.05*
Grey Tolerance Sphere	***x*** ***y***	**0.350** **0.360**	**0.300** **0.310**	**0.285** **0.325**	**0.335** **0.375**	***0.11-0.18***
Grey Sample 1	x y	0.321 0.337				*0.18*
Grey Sample 2	x y	0.321 0.337				*0.16*
Grey Sample 3	x y	0.323 0.338				*0.15*

Colours		Chromaticity Coordinates				Luminance Factor ß
		1	2	3	4	
Dark Green Tolerance Sphere	***x*** ***y***	***0.313*** ***0.682***	***0.313*** ***0.453***	***0.248*** ***0.409***	***0.127*** ***0.557***	***0.01-0.07***
Dark Green Sample 1	x y	0.243 0.484				*0.06*
Dark Green Sample 2	x y	0.215 0.544				*0.06*
Dark Green Sample 3	x y	0.250 0.527				*0.06*