



## **Laboratory for Fire Safety**

*Classification of reaction to fire in accordance with  
EN\_13501-1:2018 of Kvadrat APO*

*Classification report*

Report number Y 2254-7E-RA-001 dated 5 March 2021

## Laboratory for Fire Safety

*Classification of reaction to fire in accordance with  
EN\_13501-1:2018 of Kvadrat APO*

### *Classification report*

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Product **Kvadrat APO fabric**

Report number Y 2254-7E-RA-001  
Date 5 March 2021  
Reference HL/NvD//Y 2254-7E-RA-001  
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kvk 12028033, opdrachten volgens DNR 2011, lid NLingenieurs, btw NL.004933837B01, ISO-9001:2015

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## 1 Introduction

On behalf of Kvadrat A/S an investigation was performed with respect to the reaction to fire properties of Kvadrat APO fabric.

This classification report defines the reaction to fire classification of the product in accordance with the procedures described in EN 13501-1: 2018.



For this type of measurements the Laboratory for Fire safety has been accredited by the Dutch "Raad voor Accreditatie" (RvA).

The RvA is member of EA MLA (**EA MLA: European Accreditation Organisation MultiLateral Agreement**: <http://www.european-accreditation.org>).

*EA: "Certificates and reports issued by bodies accredited by MLA and MRA members are considered to have the same degree of credibility, and are accepted in MLA and MRA countries."*

## 2 Product description

### 2.1 General

The information in this report is based on information provided by the client.

The product investigated is Kvadrat APO fabric, hereinafter also called 'the product'. The intended application is for use as blinds for internal applications.

### 2.2 Harmonised product standard

According to the client there was no harmonised European product standard for the reaction to fire properties published at the time the tests were conducted and this report was drawn up.

### 2.3 Product identification

The most important parameters for identifying the product are summarized in Tables 2.1 and 2.2 below.

#### t2.1 General information of product to be tested

Product	Kvadrat APO fabric	
Commercial name	Kvadrat APO fabric	
Produced by	Kvadrat A/S Denmark	
Identification and sampling APO 101	Batch number:	1907000900
	Date of manufacture:	Period July-September 2019
	Date of sampling:	6 February 2020
	Sampling by:	R. Kuipers
	Date of delivery laboratory:	11 February 2020
Identification and sampling APO 191	Batch number:	2006000830
	Date of manufacture:	13 October 2020
	Date of sampling:	9 November 2020
	Sampling by:	R. Kuipers
Identification and sampling APO 431	Batch number:	2006000828
	Date of manufacture:	13 October 2020
	Date of sampling:	9 November 2020
	Sampling by:	R. Kuipers

Peutz was not involved in the selection of the test specimen (or of its materials). The laboratory cannot make any declaration about the representativeness of the provided specimen and the samples made available.

## t2.2 Additional information of product to be tested

Product	Kvadrat APO fabric	
Description	Polyester fabric, metallized	
APO 101	Colour	101
	Thickness	0.40 mm
	Nominal weight	210 g/m <sup>2</sup>
	Fire retardant additive	Yes; organophosphorus compound
	Amount of fire retardants (%)	0,5 % – 5 %
	Organic content of the colours	100 %
	Content of organic colours in the product	0-1 % (w/w)
	Orientation	Warp direction upwards (machine direction)
APO 431	Colour	431
	Thickness	0.40 mm
	Nominal weight	210 g/m <sup>2</sup>
	Fire retardant additive	Yes; organophosphorus compound
	Amount of fire retardants (%)	0,5 % – 5 %
	Organic content of the colours	100 %
	Content of organic colours in the product	0-1 % (w/w)
	Orientation	Warp direction upwards (machine direction)
APO 191	Colour	191
	Thickness	0.40 mm
	Nominal weight	210 g/m <sup>2</sup>
	Fire retardant additive	Yes; organophosphorus compound
	Amount of fire retardants (%)	0,5 % – 5 %
	Organic content of the colours	100 %
	Content of organic colours in the product	0-1 % (w/w)
	Orientation	Warp direction upwards (machine direction)

The values mentioned are the nominal values as given by the client, unless otherwise stated (MV, measured value).

## 3 Reports and results in support of this classification

### 3.1 Reports

The client has confirmed that the reports provided (see Table 3.1) may be used for this classification.

#### t3.1 Reports in support of classification

Name of laboratory	Name of client	Number and date of report	Test method Field of application rules
Peutz bv	Kvadrat A/S	Y 2254-2-RA-002, 5 March 2021	EN 13823:2010+A1:2014
Peutz bv	Kvadrat A/S	Y 2254-3-RA-002, 5 March 2021	EN-ISO 11925-2:2010
Peutz bv	Kvadrat A/S	Y 2254-5-RA-001, 5 March 2021	EN 13823:2020
Peutz bv	Kvadrat A/S	Y 2254-6-RA-001, 5 March 2021	EN-ISO 11925-2:2020

### 3.2 Results

The results obtained are summarised in Tables 3.2 and 3.4.

#### t3.2 Summary of test results EN-ISO 11925-2

Y 2254-3-RA-001—APO 101				
Flame application time 30 s			Results	
	Parameter	Number of tests	Continuous parameters (average)	Compliance parameters
Surface exposure	Fs ≤ 150 mm	6	-	Y
	Ignition of filter paper		-	N
Edge exposure	Fs ≤ 150 mm	6	-	Y
	Ignition of filter paper		-	N

  

Y 2254-3-RA-001—APO 431				
Flame application time 30 s			Results	
	Parameter	Number of tests	Continuous parameters (average)	Compliance parameters
Surface exposure	Fs ≤ 150 mm	6	-	Y
	Ignition of filter paper		-	N
Edge exposure	Fs ≤ 150 mm	6	-	Y
	Ignition of filter paper		-	N

## Y 2254-3-RA-001—APO 191

Flame application time 30 s		Results	
Parameter	Number of tests	Continuous parameters (average)	Compliance parameters
Surface exposure	6	$F_s \leq 150 \text{ mm}$	Y
		Ignition of filter paper	N
Edge exposure	6	$F_s \leq 150 \text{ mm}$	Y
		Ignition of filter paper	N

The product was fully tested in accordance with EN ISO 11925-2 using surface and edge exposure with all three colours and all results were well within the limits for a classification B, C or D.

### t3.3 Results Single Burning Item test

Parameter	Test 1	Test 2	Test 3	Test 4	Test 5	Classification
	APO 101-1	APO 101-2	APO 101-3	APO 191-1	APO 431-1	parameter
THR <sub>600s</sub> [MJ]	0.04	0.14	0.18	(0.14)	(0.31)	0.1
FIGRA <sub>0,2MJ</sub> [W/s]	0.00	0.00	0.00	(0.00)	(0.00)	0.0
FIGRA <sub>0,4MJ</sub> [W/s]	0.00	0.00	0.00	(0.00)	(0.00)	0.0
TSP <sub>600s</sub> [m <sup>2</sup> ]	29.87	26.43	25.21	(6.47)	(6.49)	27.2
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]	0.00	0.00	0.00	(0.00)	(0.00)	0.0
LFS<edge [Y/N]	N	N	N	N	N	N
FDP ≤ 10 s [Y/N]	N	N	N	N	N	N
FDP > 10 s [Y/N]	N	N	N	N	N	N

With regard to this classification of the reaction to fire for the product, only colour varies. The procedure for classification with regard to colours is based on EGOLF recommendation 003-2016 'Selection of colours for covering a range', 18/10/2016. The results show that the tests all fall within the limits for a B-s1,d0 classification.

The highest THR<sub>600s</sub> value in table 3.3 was 0.31 MJ for the APO 431, approximately 4% of the classification limit, and the highest results for the TSP<sub>600s</sub> was 29.87 m<sup>2</sup> in test APO 101-1, approximately 60% of the classification limit. The measured results relating to class B, are well within the limits and for this product the TSP is the most sensitive parameter for a s1 classification.

It should be noted that the large difference in TSP between APO 101 on the one hand and APO 191 and APO 431 on the other hand is caused by the procedure for calculating smoke production, which was changed in EN 13823:2020. The test for APO 191 and APO 431 followed the procedure in the new version of the standard (EN 13823:2020) for calculating smoke production. It is also noted that if the EN 13823:2010 calculation had been followed for APO 191 and APO 431, the calculated value would not have deviated significantly from APO 101.

Because of the test results and considering the above arguments, it is concluded that the APO 101 is the decisive colour and the APO 101 results are used for classification.



## t3.4 Summary of test results EN 13823 in support for classification

Parameter	Number of tests	Results	
		Continuous parameters (average)	Compliance parameters
FIGRA <sub>0,2MJ</sub>	[W/s]	0.0	-
FIGRA <sub>0,4MJ</sub>	[W/s]	0.0	-
THR <sub>600s</sub>	[MJ]	0.1	-
SMOGRA	[m <sup>2</sup> /s <sup>2</sup> ]	0.0	-
TSP <sub>600s</sub>	[m <sup>2</sup> ]	27.2	-
LFS reaching edge		-	N
Flaming droplets/particles			
– FDP ≤ 10 s		-	N
– FDP > 10 s		-	N

## 3.3 Classification criteria

The classification to be obtained is based on the classification criteria given in EN 13501-1. In Tables 3.5 and 3.6 these criteria are summarised.

## t3.5 Classification criteria

Test	Parameter Continuous (average) or compliance	Class		
		B	C	D
EN-ISO 11925-2	Flame spread ≤ 150 mm	Y	Y	Y
EN 13823	FIGRA <sub>0,2MJ</sub>	[W/s] ≤ 120	-	-
	FIGRA <sub>0,4MJ</sub>	[W/s] -	≤ 250	≤ 750
	THR <sub>600s</sub>	[MJ] ≤ 7.5	≤ 15	-
	LFS reaching edge	N	N	-

## t3.6 Criteria additional classifications

Test	Parameter Continuous (average) or compliance	Class			Class		
		s1	s2	s3	d0	d1	d2
EN-ISO 11925-2	Ignition of filter paper <i>Note: ignition of filter paper leads to classification d2, irrespective of the results for FDP in EN 13823</i>	-	-	-	N	N	Y
EN 13823	SMOGRA	[m <sup>2</sup> /s <sup>2</sup> ] ≤ 30	≤ 180	not s1	-	-	-
	TSP <sub>600s</sub>	[m <sup>2</sup> ] ≤ 50	≤ 200	or s2	-	-	-
EN 13823	Flaming droplets/particles (FDP) within 600 s						
	– FDP ≤ 10 s	-	-	-	N	Y	-
	– FDP > 10 s	-	-	-	N	N	not d0 or d1

## 4 Classification and field of application

### 4.1 Reference of classification

This classification has been carried out in accordance with EN 13501-1:2018 and EGOLF Recommendation EGR 003-2016—Selection of colours for covering a range, 18/10/2016.

### 4.2 Classification

The product, APO fabric, has been classified to its reaction to fire behaviour as: B. The additional classification for the smoke production is: s1, the additional classification for flaming droplets is: d0.

**Reaction to fire classification: B-s1, d0**

### 4.3 Field of application

The classification is valid for the product parameters and end use applications as stated in Tables 4.1 and 4.2.

#### t4.1 Product parameters

Parameter	
Thickness	0.4 mm
Nominal weight	210 g/m <sup>2</sup>
Fire retardant utilised	Yes; organophosphorus compound
Amount of fire retardants (%)	0,5 % – 5 %
Colours	See appendix 1
Other	No changes in composition

#### t4.2 End use parameters

Parameter	
Substrate	Free standing and with a ventilated cavity
Cavity	Ventilated
Joints	No joints
Orientation	Warp direction upwards (machine direction)
Other	Use as freehanging blinds for internal applications

## 5 Limitations

There are no limits in time on the validity of this classification document.

This classification document does not represent type approval or certification of the product.



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Management

This report contains 11 pages and 1 appendix:  
Appendix 1 Available colours (1 page)

**Appendix 1**  
**Available colours**



t5.1 Available colours

 0101	 0131	 0161	 0191	 0201	 0431	 0601	 0701
 101	 131	 161	 191				
 201	 431	 601	 701				