



# Properties of the fire protected paint system

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# Requirements according to PN EN 45545

Parameter	Max or min	HL1	HL2	HL3
Unit				
<b>MARHE R1, R7</b>	max	–	90	60
<b>Ds(4) R1</b>	max	600	300	150
<b>VOF4 R1</b>	max	1 200	600	300
<b>CITG</b>		1,2	0,9	0,75 (R1)
<b>dimensionless</b>	max	-	1,8	1,5 (R7)
<b>Ds max. R7</b>	max	-	600	300
<b>CFE R1, R7</b>	min	20	20	20
		20	20	20

# Characteristics of the railway coating system using commonly used products

System thickness above 2000 [µm]

**Failure to meet the requirements PN EN 45545**

Coating system	Thickness [µm]	Sample name	Test			
			MARHE [kW/m <sup>2</sup> ]	Flame propagation		
				CFE [kW/m <sup>2</sup> ]	length of the burned part [mm]	burning time
anticorrosive primer	<b>82,4</b>	<b>A155/17</b>	<b>208,1</b>	<b>11,9</b>	<b>447</b>	<b>755</b>
Polyester putty	<b>2070,9</b>					
Filler	<b>68,4</b>					
Basecoat	<b>149,1</b>					
Clearcoat	<b>149,1</b>					
Sum / Average	<b>2370,8</b>					

# Characteristics of the railway coating system using commonly used products

System thickness about 300 [µm]

Fulfillment of requirements PN EN 45545

Coating system	Thickness [µm]	Sample name	Test			
			MARHE [kW/m <sup>2</sup> ]	Flame propagation		
				CFE [kW/m <sup>2</sup> ]	length of the burned part [mm]	burning time [s]
anticorrosive primer	40,7	A190/17	45,8	28,5	317	270
Polyester putty	98,9					
Filler	101,3					
Basecoat	45,8					
Clearcoat						
Sum / Average	286,6					

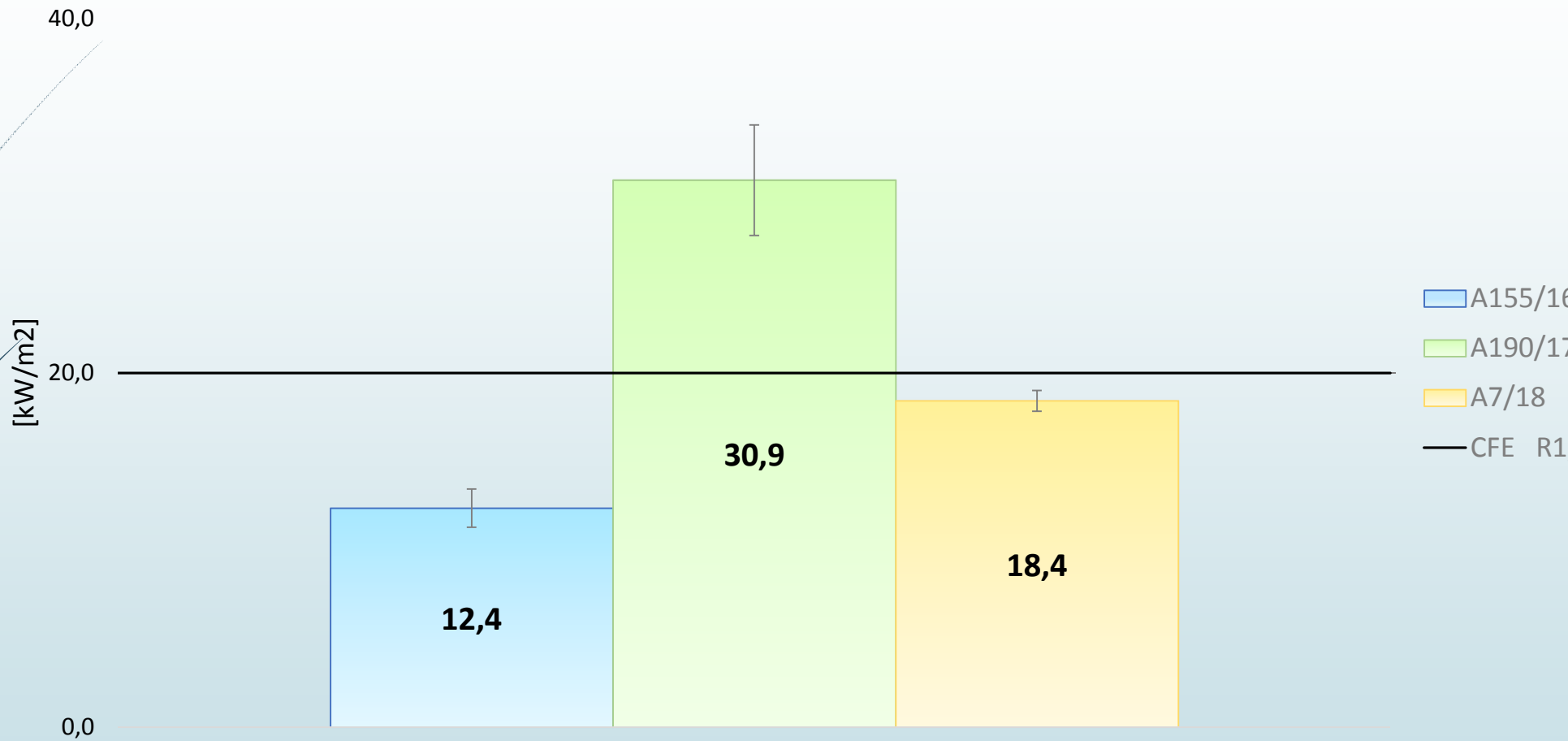
# Characteristics of the railway coating system using Barwa poliester putty

System thickness above 2000 [µm]

System in development

Coating system	Thickness [µm]	Sample name	Test			
			MARHE [kW/m <sup>2</sup> ]	Flame propagation		
				CFE [kW/m <sup>2</sup> ]	length of the burned part [mm]	burning time [s]
anticorrosive primer	41,3	A7/18	79,7	19,1	393	1605
Polyester putty - BARWA	2047,5					
Filler	217,5					
Basecoat	55,0					
Clearcoat						
Sum / Average	2360,0					

# CFE HL2 20kW/m<sup>2</sup>

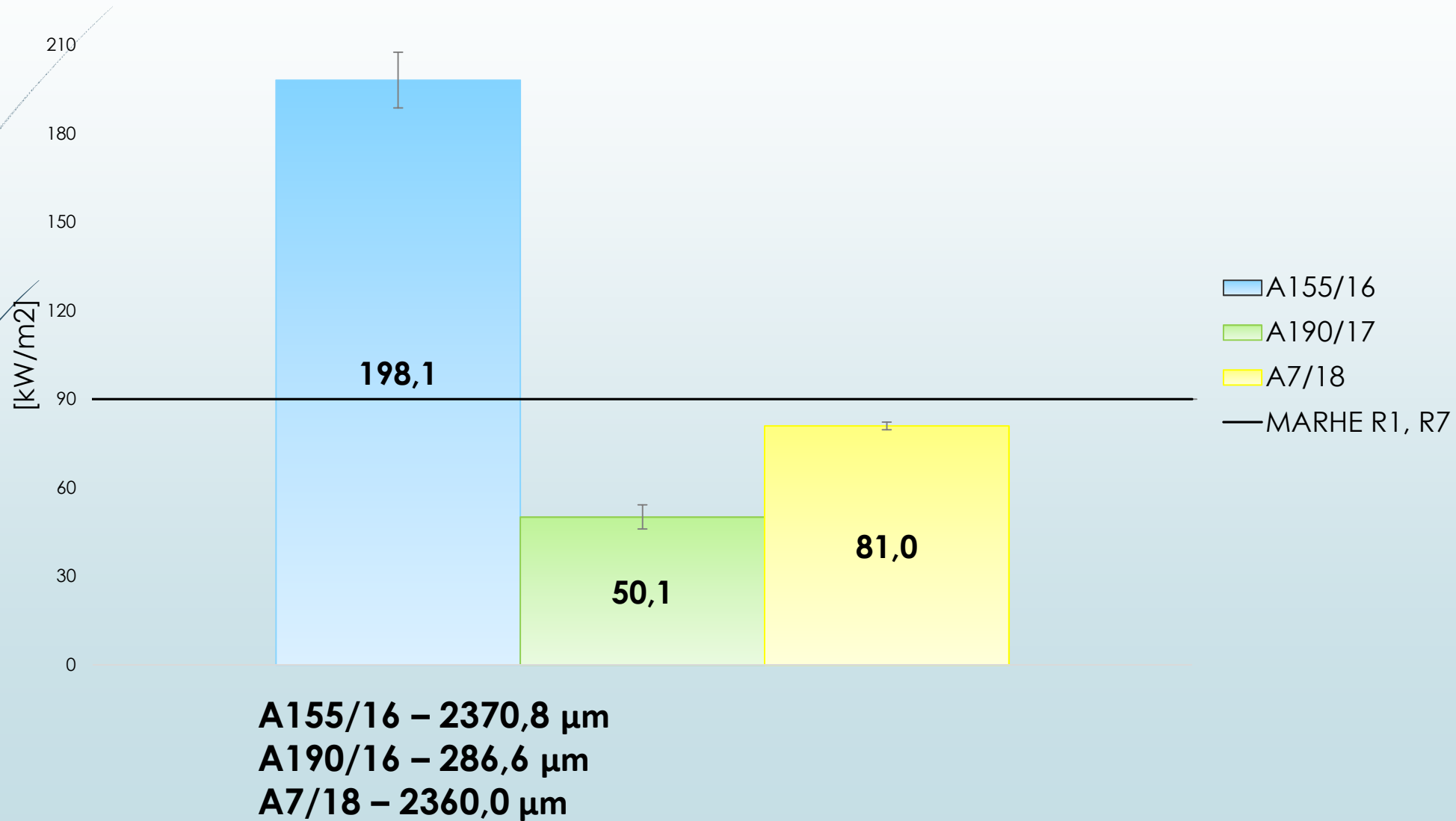


**A155/16 – 2370,8 μm**

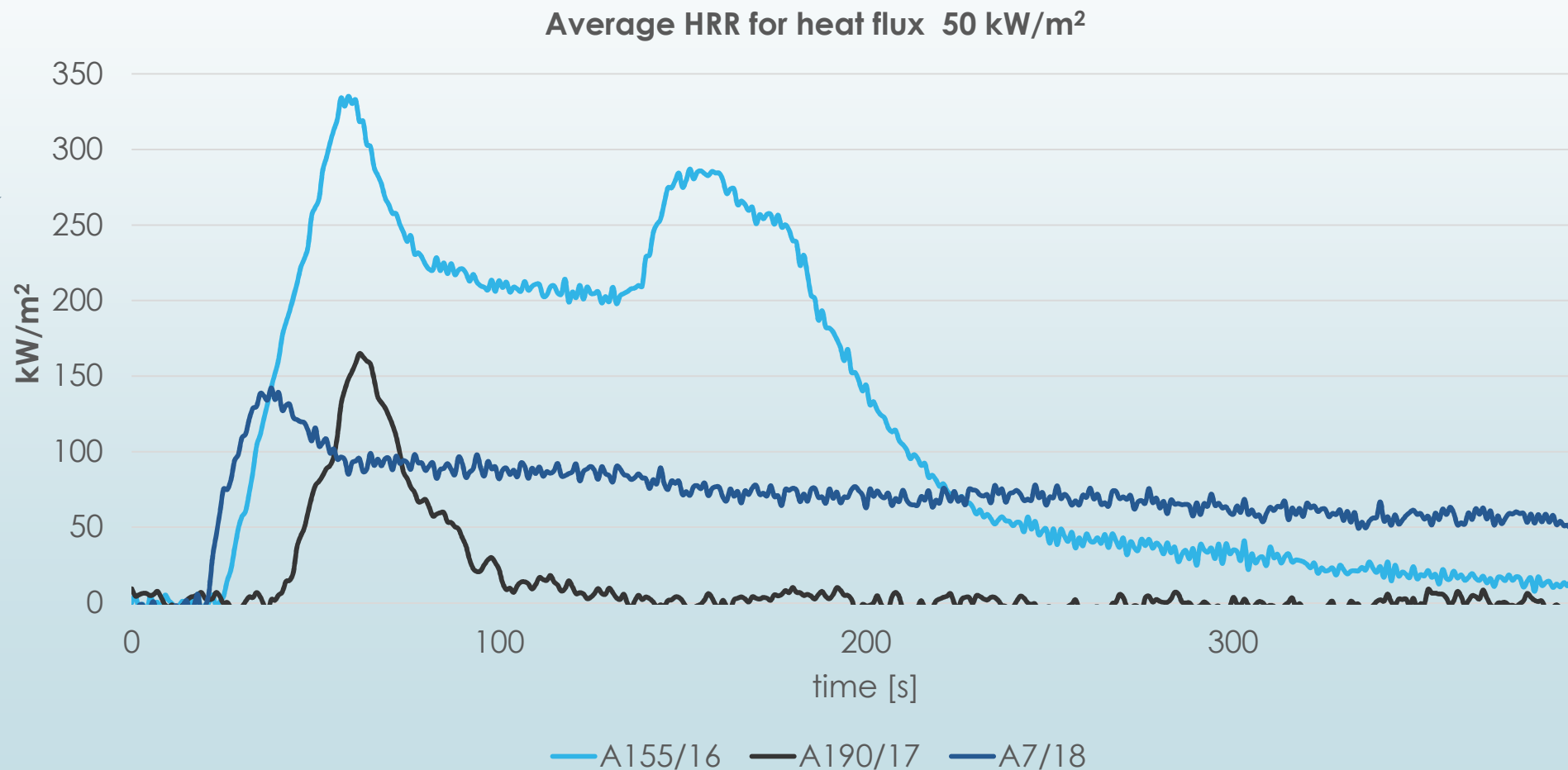
**A190/16 – 286,6 μm**

**A7/18 – 2360,0 μm**

# MARHE HL2 90kW/m<sup>2</sup>



# Comparison of HRR results of tested polyester putties



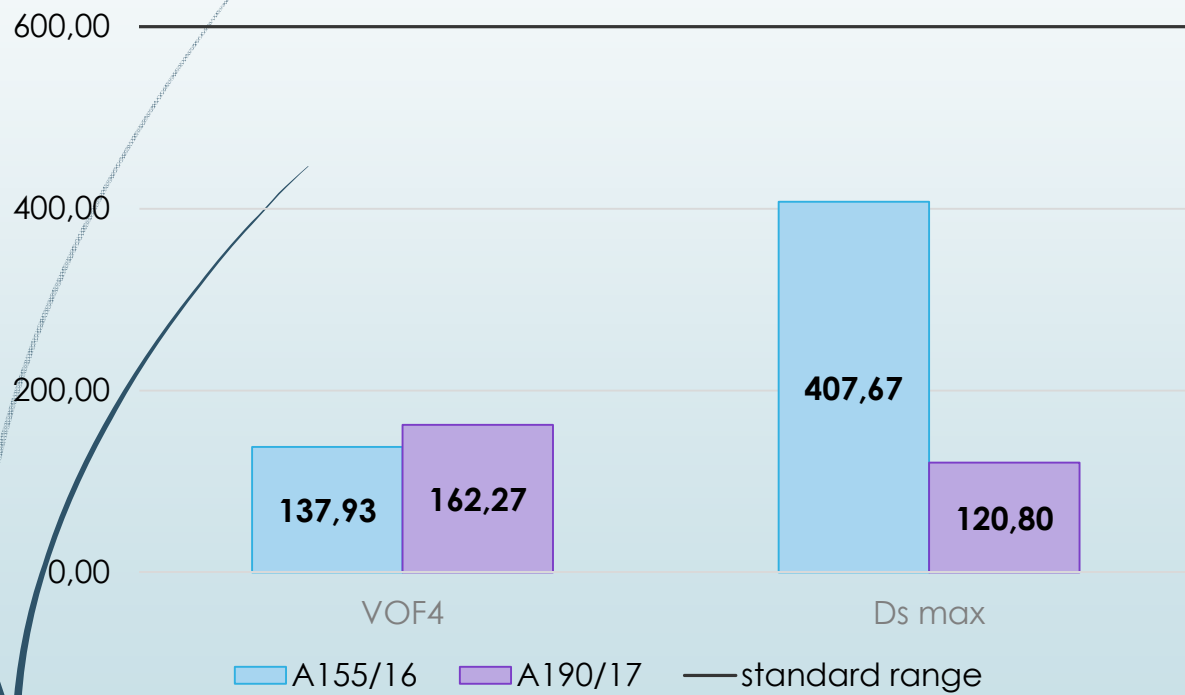


# Comparison of ARHE results of tested polyester putties

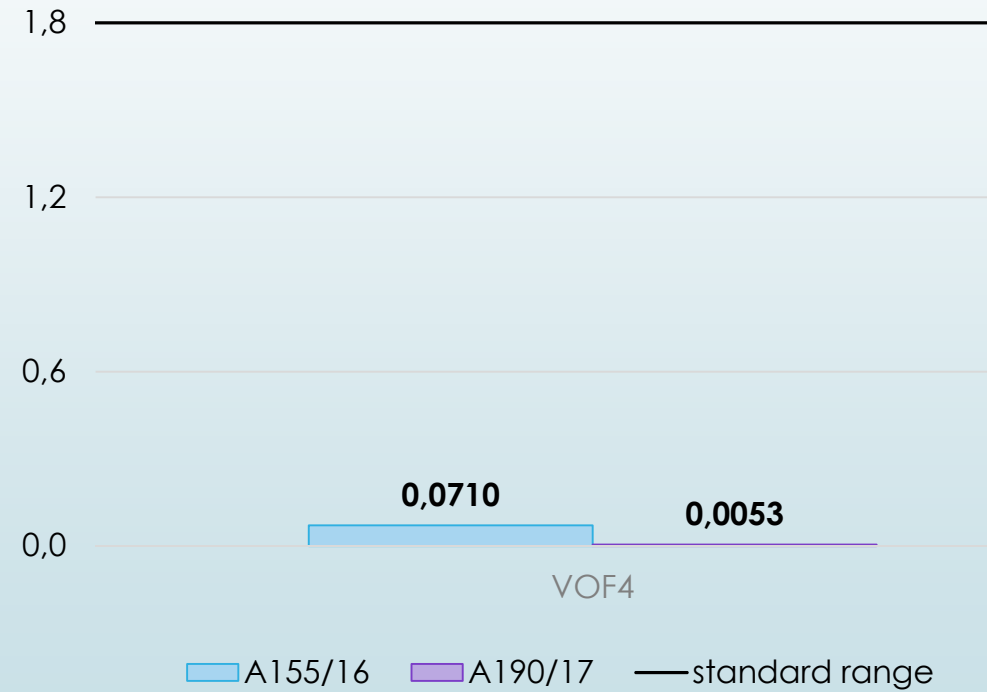


# Smoke properties

## Optical density of smoke

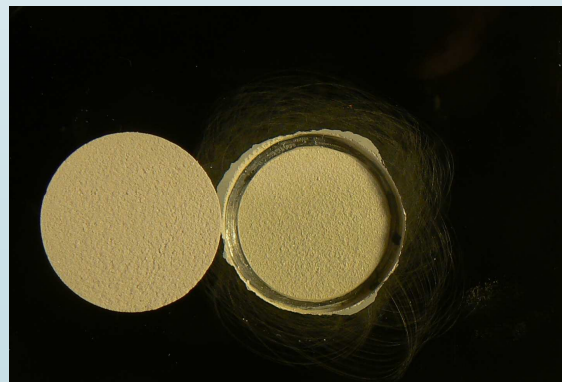


## Toxicity CIT(G)8



# Pull-off test

STANDARD Polyester putty [MPa]	BARWA Polyester putty [MPa]
2,33	2,28
2,28	2,26
2,30	2,18
<b>Average</b>	<b>Average</b>
<b>2,30</b>	<b>2,24</b>





Thank you for your attention