RESEARCH REPORT - LABORATORY

PROJECT : yarn "ALS 708N" and "ALS 709N"

PURPOSE RESEARCH : testing the climatic resistance of yarn samples
in accordance with the International Match Standard

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CONCLUSION

From the results of the climatic resistance research during 5000 hours it is concluded that
the yarn samples "ALS 708N" and "ALS 709N" have passed the test successfully.

11th May 2016

Kiwa ISA Sport B.V.

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RESEARCH DESCRIPTION

ALSAN PLASTİK TEKSTİL METAL SAN.TİC.LTD.ŞTİ. asked Kiwa ISA Sport B.V. to execute a climatic resistance research on the yarn samples "ALS 708N" and "ALS 709N".

The yarn samples are subjected to a climatic simulation, including Ultra Violet light, moisture and temperature changes during 5000 hours, which represents a period of five years of use in practice. The climatic simulation is performed in accordance with the International Match Standard.

Before and after 5000 hours of climatic simulation, the following characteristics are determined at a temperature of approximately 23°C and a relative humidity of about 50%:
- tensile strength yarn (according to standard NEN-EN 13864);
- yarn colour (grey scale according to standard ISO 105-A02).

Besides the yarn is specified by the determination of the following characteristics:
- shape;
- yarn weight (dtex);
- thickness;
- width;
- yarn identification (DSC-analysis according to standard ISO 11357).

The results of the climatic resistance research are described on the next pages.

RESEARCH RESULTS

The climatic simulation is performed in accordance with the International Match Standard.

Table 1 gives an overview of the specifications of the yarn.

Table 1: specification "ALS 708N" and "ALS 709N"

Characteristic	Results	
	ALS 709N	ALS 708N
Shape	Monofilament 	Monofilament
Yarn weight	1935 dtex	2144 dtex
Thickness (centre)	0.18 mm	0.21 mm
Width	1.5 mm	1.5 mm
Yarn identification (onset)	88°C and 131°C	89°C and 133°C
RAL	6002	6017

Table 2 and 3 give an overview of the research results for the yarn "ALS 708N" and "ALS 709N" before and after 5000 hours climatic simulation. The analyses of the yarn identification (DSC) are enclosed in appendix I.

Table 2: climatic simulation results "ALS 708N"

Characteristic	Results			
	Before simulation	After simulation 5000 h	Relative change	International standard
Tensile strength	19.4 N	17.9 N	- 8%	≤ 50%
Colour				
L	46.4	46.2	4 - 5	≥ 3
a	-12.4	-11.5	(grey scale)	(grey scale)
b	24.1	23.3		

Table 3: climatic simulation results "ALS 709N"

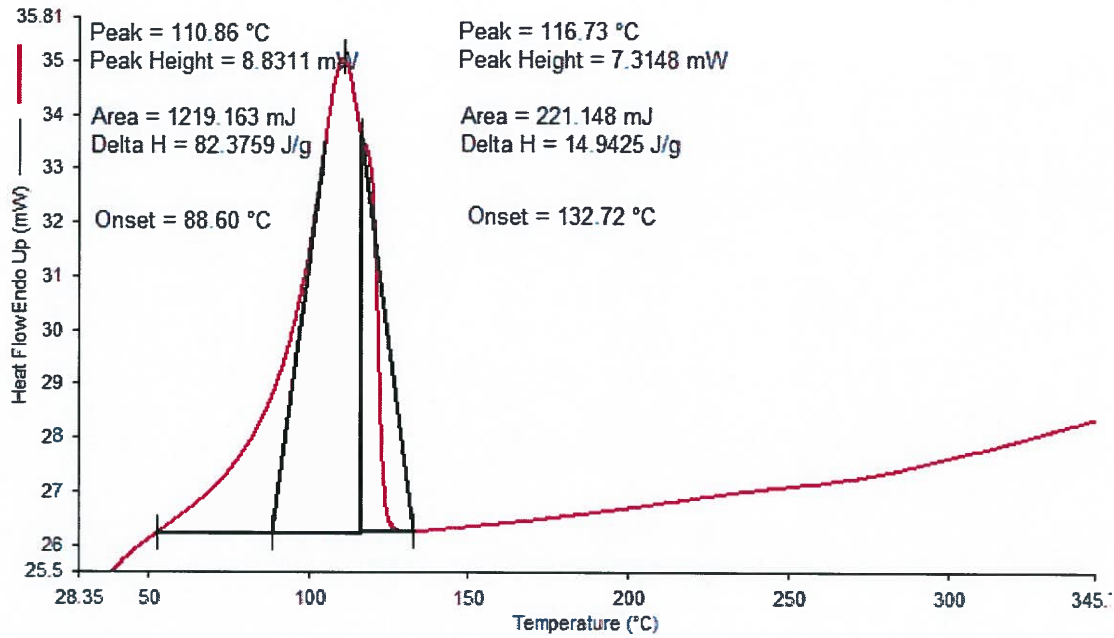| Characteristic		Results			
		Before simulation	After simulation 5000 h	Relative change	International standard
Tensile strength		18.6 N	18.5 N	- 1%	≤ 50%
Colour					
	L	36.5	36.6	4 - 5	≥ 3
	a	-10.2	-9.4	(grey scale)	(grey scale)
	b	12.5	12.4		

Conclusion:

From the results of the climatic resistance research during 5000 hours it is concluded that the yarn samples "ALS 708N" and "ALS 709N" have passed the test successfully.

APPENDIX I

yarn identification

ALS 708N

Peak = 110.86 °C
Peak Height = 8.8311 mW

Area = 1219.163 mJ
Delta H = 82.3759 J/g

Onset = 88.60 °C

Peak = 116.73 °C
Peak Height = 7.3148 mW

Area = 221.148 mJ
Delta H = 14.9425 J/g

Onset = 132.72 °C

ALS 709N

Peak = 110.15 °C
Peak Height = 5.5540 mW

Area = 775.449 mJ
Delta H = 73.7820 J/g

Onset = 88.45 °C

Peak = 116.18 °C
Peak Height = 4.5734 mW

Area = 133.603 mJ
Delta H = 12.7120 J/g

Onset = 130.62 °C