TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Akreditovaná zkušební laboratoř, Autorizovaná osoba, Notifikovaná osoba, Certifikační orgán, Inspekční orgán
Accredited Testing Laboratory, Authorized Body, Notified Body, Certification Body, Inspection Body
Odštěpný závod ZKUŠEBNÍ ÚSTAV LEHKÉHO PRŮMYSLU
Branch Office Test Institute of the Light Industries
Nemanická 441/8, 370 10 České Budějovice

Certificate Body

issues

PROTOCOL

on product certification result

No.:100-064854

Product name:
Foils:
PLASTEL® 8800
POLYMAR® 8205
POLYMAR® 7908
POLYMAR® 8556

to the applicant
LOW & BONAR Czech s.r.o.

ID:	27481875
address:	Šlechtova 860 Lomnice nad Popelkou
order:	Z100210086

Number of protocol pages incl. the title one: 7

Person responsible for content and correctness of this Protocol:

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p. Certifikační orgán ZÚS

Martina Mrhalová, M.Sc.
Head Evaluator

České Budějovice, 30th March 2021

Note: This protocol can be copied as the whole only, otherwise a written approval of the Deputy Head of Certification Body is necessary.
Technický a zkušební ústav stavební Praha, s. p., o.z. ZÚLP České Budějovice, Nemanická 441/8, 370 10 České Budějovice, Česká republika
Tel.: +420 386 709 195, mobil: +420 603 202 010, www.tzus.eu, e-mail: mrhalova@tzus.cz
Bankovní spojení (Bank): KB Praha 1 Czech Republic, č.ú.: 1501-931/0100, IČ: 00015679, DIČ: CZ00015679

1. General data

1.1 Data about the applicant

- LOW & BONAR Czech s.r.o., Šlechtova 860, Lomnice nad Popelkou
- ID: 27481875

1.2 Data about product

The following foils, potentially the most risky in terms of production and recipes, were delivered for testing as representatives of the products, see Table and Figure 1:

Table

Sample number	Product name
89	PLASTEL® 8800 5340 – red (foil)
90	POLYMAR® 8205 5240 – grass green (foil)
91	POLYMAR® 7908 5300 – dark green (foil)
92	POLYMAR® 8556 5240 – blue (foil)

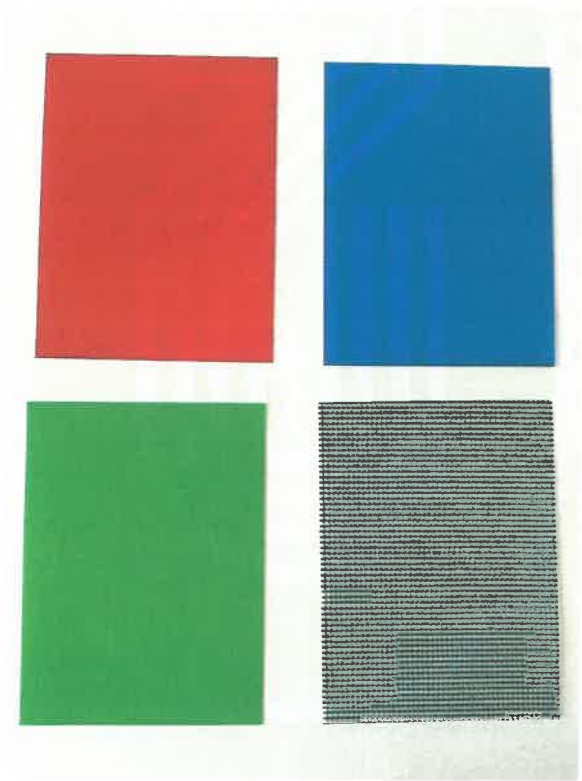

Figure 1

Name and address of the manufacturer: **LOW & BONAR Czech s.r.o.**
Šlechtova 860
Lomnice nad Popelkou

1.3 Data list submitted by the applicant for the product certification

- Application from 2021-03-05.

1.4 List of other documents used by the product certification

1.5 Technical specification, technical standards relating to the product certification

- The Law No. 258/2000 Coll., about public health protection.
- European standard ČSN EN 71-3 (November 2019), Safety of toys - Part 3: Migration of certain elements

2. Result of data review submitted by the applicant

- Data submitted were checked on 2021-03-05.

3. Product checking

3.1. Technical requirements

- The product was evaluated according to the European standard ČSN EN 71-3 (November 2019), Safety of toys - Part 3: Migration of certain elements

3.2. List of Test and checking reports:

- The Test Report No.100-064853 dated 2021-03-29, issued by TZÚS Prague, s.p. – Branch Office ZÚLP Test Institute of Light Industries České Budějovice

3.3. Evaluation of test results and product checking

ČSN EN 71-3 (November 2019), Safety of toys - Part 3: Migration of certain elements, category III

Preparation of the extract:
The sample was extracted into an aqueous hydrochloric acid solution of concentration c (HCl) = 0.07 mol / l, for 2 hours, at (37 ± 2) ° C.

The contents of the above heavy metal elements were determined by ICP-MS method in the ALS laboratory by measuring the hydrochloric acid extract. Mercury was measured by fluorescence spectrometry.
Hexavalent Chromium was measured spectrometrically by reaction with 1,5-diphenylcarbazide.

Sample No. 89 - PLASTEL® 8800 5340 – red (foil)				
Parameter measured	**Test procedure**	**Test result mg/kg[1)]**	**Required/ declared level mg/kg[1)]**	**Evaluation**
Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	≤ 560	compliant
As		< 0.9	≤ 47	compliant
Ba		< 5	≤ 18 750	compliant
B		< 10	≤ 15 000	compliant
Sn		< 5	≤ 180 000	compliant
Al		< 5	≤ 70 000/28 130[2)]	compliant
Cr^{III}		< 0.2	≤ 460	compliant
Cr^{VI}		< 0.053	≤ 0.053	compliant
Cd		< 0.2	≤ 17	compliant
Co		< 1	≤ 130	compliant
Mn		< 1	≤ 15 000	compliant
Cu		< 0.5	≤ 7 700	compliant
Ni		< 1	≤ 930	compliant
Pb		< 0.5	≤ 23	compliant
Org. Sn		< 5	≤ 12	compliant
Hg		< 0.01	≤ 94	compliant
Se		< 5	≤ 460	compliant
Sr		< 1	≤ 56 000	compliant
Zn		1.5	≤ 46 000	compliant

[1)] – The results are given in mg element / kg material.

[2)] – Migration limit for aluminum for Category III toy material applicable from 20.5.2021 pursuant to COMMISSION DIRECTIVE (EU) 2019/1922 of 18 November 2019 amending, for the purposes of adaptation to scientific and technical development, point 13 of Part III of Annex II to Directive and of the Council 2009/48 / EC on the safety of toys with regard to aluminum.

Sample No. 90 - POLYMAR® 8205 5240 – grass green (foil)				
Parameter measured	**Test procedure**	**Test result mg/kg[1)]**	**Required/ declared level mg/kg[1)]**	**Evaluation**
Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	≤ 560	compliant
As		< 0.9	≤ 47	compliant
Ba		< 5	≤ 18 750	compliant
B		< 10	≤ 15 000	compliant
Sn		< 5	≤ 180 000	compliant
Al		< 5	≤ 70 000/28 130[2)]	compliant
Cr^{III}		< 0.2	≤ 460	compliant
Cr^{VI}		< 0.053	≤ 0.053	compliant

Sample No. 90 - POLYMAR® 8205 5240 – grass green (foil)				
Parameter measured	**Test procedure**	**Test result mg/kg[1)]**	**Required/ declared level mg/kg[1)]**	**Evaluation**
Cd	Preparation of the extract: ZÚLP method Measurement: ALS method	< 0.2	≤ 17	compliant
Co		< 1	≤ 130	compliant
Mn		< 1	≤ 15 000	compliant
Cu		< 0.5	≤ 7 700	compliant
Ni		< 1	≤ 930	compliant
Pb		< 0.5	≤ 23	compliant
Org. Sn		< 5	≤ 12	compliant
Hg		< 0.01	≤ 94	compliant
Se		< 5	≤ 460	compliant
Sr		< 1	≤ 56 000	compliant
Zn		1.7	≤ 46 000	compliant

[1)] – The results are given in mg element / kg material.

[2)] – Migration limit for aluminum for Category III toy material applicable from 20.5.2021 pursuant to COMMISSION DIRECTIVE (EU) 2019/1922 of 18 November 2019 amending, for the purposes of adaptation to scientific and technical development, point 13 of Part III of Annex II to Directive and of the Council 2009/48 / EC on the safety of toys with regard to aluminum.

Sample No. 91 - POLYMAR® 7908 5300 – dark green (foil)				
Parameter measured	**Test procedure**	**Test result mg/kg[1)]**	**Required/ declared level mg/kg[1)]**	**Evaluation**
Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	≤ 560	compliant
As		< 0.9	≤ 47	compliant
Ba		18.5	≤ 18 750	compliant
B		< 10	≤ 15 000	compliant
Sn		< 5	≤ 180 000	compliant
Al		< 5	≤ 70 000/28 130[2)]	compliant
Cr^{III}		< 0.2	≤ 460	compliant
Cr^{VI}		< 0.053	≤ 0.053	compliant
Cd		< 0.2	≤ 17	compliant
Co		< 1	≤ 130	compliant
Mn		< 1	≤ 15 000	compliant
Cu		< 0.5	≤ 7 700	compliant
Ni		< 1	≤ 930	compliant
Pb		< 0.5	≤ 23	compliant
Org. Sn		< 5	≤ 12	compliant
Hg		< 0.01	≤ 94	compliant
Se		< 5	≤ 460	compliant
Sr		< 1	≤ 56 000	compliant
Zn		4.3	≤ 46 000	compliant

[1] – The results are given in mg element / kg material.

[2] – Migration limit for aluminum for Category III toy material applicable from 20.5.2021 pursuant to COMMISSION DIRECTIVE (EU) 2019/1922 of 18 November 2019 amending, for the purposes of adaptation to scientific and technical development, point 13 of Part III of Annex II to Directive and of the Council 2009/48 / EC on the safety of toys with regard to aluminum.

Sample No. 92 - POLYMAR® 8556 5240 – blue (foil)				
Parameter measured	**Test procedure**	**Test result mg/kg[1]**	**Required/ declared level mg/kg[1]**	**Evaluation**
Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	≤ 560	compliant
As		< 0.9	≤ 47	compliant
Ba		< 5	≤ 18 750	compliant
B		< 10	≤ 15 000	compliant
Sn		< 5	≤ 180 000	compliant
Al		< 5	≤ 70 000/28 130[2]	compliant
Cr^{III}		< 0.2	≤ 460	compliant
Cr^{VI}		< 0.053	≤ 0.053	compliant
Cd		< 0.2	≤ 17	compliant
Co		< 1	≤ 130	compliant
Mn		< 1	≤ 15 000	compliant
Cu		< 0.5	≤ 7 700	compliant
Ni		< 1	≤ 930	compliant
Pb		< 0.5	≤ 23	compliant
Org. Sn		< 5	≤ 12	compliant
Hg		< 0.01	≤ 94	compliant
Se		< 5	≤ 460	compliant
Sr		< 1	≤ 56 000	compliant
Zn		1.9	≤ 46 000	compliant

[1] – The results are given in mg element / kg material.

[2] – Migration limit for aluminum for Category III toy material applicable from 20.5.2021 pursuant to COMMISSION DIRECTIVE (EU) 2019/1922 of 18 November 2019 amending, for the purposes of adaptation to scientific and technical development, point 13 of Part III of Annex II to Directive and of the Council 2009/48 / EC on the safety of toys with regard to aluminum.

4. Conclusion

The samples presented of foils **complied** in the monitored parameters with requirements of:

- Act No. 258/2000 Coll., On the protection of public health
- European standards ČSN EN 71-3 (November 2019), Safety of toys – Part 3: Migration of certain elements

Findings and conclusions given in this protocol are valid provided that no change of conditions occurs which the conformity checking was carried out under and if this change can influence products properties (e.g. change of technical standards, technical specification, manufacturing technology, input raw materials and manufacturing equipment).

- **END OF THE PROTOCOL ON PRODUCT CERTIFICATION RESULT** -

Technický a zkušební ústav stavební Praha, s. p.,
odštěpný závod Zkušební ústav lehkého průmyslu
Nemanická 441/8, 370 10 České Budějovice

Odštěpný závod ZÚLP - zkušební laboratoř 1018.9

T E S T P R O T O C O L

Number: 100-064853
dated: 2021-03-29

Name and address of the customer: **LOW & BONAR Czech s.r.o.**
Šlechtova 860
Lomnice nad Popelkou

Name and address of the manufacturer: **LOW & BONAR Czech s.r.o.**
Šlechtova 860
Lomnice nad Popelkou

Product name: Foils:
PLASTEL® 8800
POLYMAR® 8205
POLYMAR® 7908
POLYMAR® 8556

Test method:

Preparation of extracts for determination of migration of certain elements:	Method No. 100608-01 (ČSN EN 71-3)
Determination of elements by ICP-MS method:	ALS Czech Republic, s.r.o.
Determination of mercury by fluorescence spectrometry:	ALS Czech Republic, s.r.o.
Determination of CrVI content - spectrophotometrically:	non-accredited test

The test was performed in the premises of a testing laboratory:
TZÚS Praha s.p. – o.z. ZÚLP České Budějovice, Nemanická 441/8, 370 10 České Budějovice
ALS Czech Republic, s.r.o., Na Harfě 336/9, 190 00 Praha 9 - Vysočany

Date of sample receipt for testing: 2021-03-04

Tests were carried out: **from:** 2021-03-04 **to:** 2021-03-29

Name, function of the person entitled to sign this Test Protocol:

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p. o.z. ZÚLP České Budějovice Zkušební laboratoř ZÚS

Martina Mrhalová, M.Sc.
Technical Head of Laboratory

Test legal basis:
- Act No. 258/2000 Coll., On the protection of public health
- ČSN EN 71-3, Safety of toys - Part 3: Migration of certain elements, edition November 2019

Description and identification of the sample:

The following foils, potentially the most risky in terms of production and recipes, were delivered for testing as representatives of the products, see Table and Figure 1:

Table

Sample number	Product name
89	PLASTEL® 8800 5340 – red (foil)
90	POLYMAR® 8205 5240 – grass green (foil)
91	POLYMAR® 7908 5300 – dark green (foil)
92	POLYMAR® 8556 5240 – blue (foil)

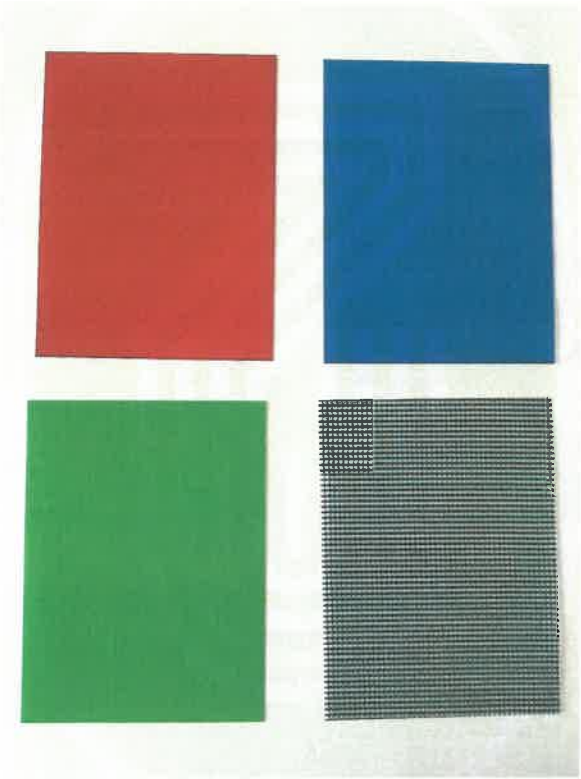

Figure 1

Devices used: inductively coupled plasma mass spectrometer (ICP-MS), fluorescence spectrometer, Specord 210 spectrophotometer

Test results:

<u>Determination of migration of certain elements, ČSN EN 71-3 (November 2019), category III</u>

Preparation of the extract:
The sample was extracted into an aqueous hydrochloric acid solution of concentration
c (HCl) = 0.07 mol / l, for 2 hours, at (37 ± 2) ° C.

The contents of the above heavy metal elements were determined by ICP-MS method in the ALS laboratory by measuring the hydrochloric acid extract. Mercury was measured by fluorescence spectrometry.
Hexavalent Chromium was measured spectrometrically by reaction with 1,5-diphenylcarbazide.

Sample No. 89 - PLASTEL® 8800 5340 – red (foil)				
Parameters measured		**Method**	**Results[1] mg/kg**	**Extended uncertainty in % rel.**
Antimony	Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	-
Arsenic	As		< 0.9	-
Barium	Ba		< 5	-
Boron	B		< 10	-
Tin	Sn		< 5	-
Aluminium	Al		< 5	-
Chromium	Cr		< 0.2	-
Chromium (III)[2]	Cr (III)		< 0.2	-
Chromium (VI)	Cr (VI)		< 0.053	-
Cadmium	Cd		< 0.2	-
Cobalt	Co		< 1	-
Manganese	Mn		< 1	-
Copper	Cu		< 0.5	-
Nickel	Ni		< 1	-
Lead	Pb		< 0.5	-
Organically bound tin[3]	Sn-org. bound		< 5	-
Mercury	Hg		< 0.01	-
Selenium	Se		< 5	-
Stroncium	Sr		< 1	-
Zinc	Zn		1.5	-

[1] Results are given in mg element / kg material.
[2] Cr (III) was determined by calculation from the difference of total Chromium and Chromium (VI).
[3] Sn - organically bound was not measured due to the fact that the concentration of total tin is below the detection limit of 5 mg / kg. This value also meets the required level for organic tin ≤ 12 mg / kg.

Sample No. 90 - POLYMAR® 8205 5240 – grass green (foil)				
Parameters measured		**Method**	**Results[1] mg/kg**	**Extended uncertainty in % rel.**
Antimony	Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	-
Arsenic	As		< 0.9	-
Barium	Ba		< 5	-
Boron	B		< 10	-
Tin	Sn		< 5	-
Aluminium	Al		< 5	-
Chromium	Cr		< 0.2	-
Chromium (III)[2]	Cr (III)		< 0.2	-
Chromium (VI)	Cr (VI)		< 0.053	-
Cadmium	Cd		< 0.2	-
Cobalt	Co		< 1	-
Manganese	Mn		< 1	-
Copper	Cu		< 0.5	-
Nickel	Ni		< 1	-
Lead	Pb		< 0.5	-
Organically bound tin[3]	Sn-org. bound		< 5	-
Mercury	Hg		< 0.01	-
Selenium	Se		< 5	-
Stroncium	Sr		< 1	-
Zinc	Zn		1.7	-

[1] Results are given in mg element / kg material.
[2] Cr (III) was determined by calculation from the difference of total Chromium and Chromium (VI).
[3] Sn - organically bound was not measured due to the fact that the concentration of total tin is below the detection limit of 5 mg / kg. This value also meets the required level for organic tin ≤ 12 mg / kg.

Sample No. 91 - POLYMAR® 7908 5300 – dark green (foil)				
Parameters measured		**Method**	**Results[1] mg/kg**	**Extended uncertainty in % rel.**
Antimony	Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	-
Arsenic	As		< 0.9	-
Barium	Ba		18.5	-
Boron	B		< 10	-
Tin	Sn		< 5	-
Aluminium	Al		< 5	-
Chromium	Cr		< 0.2	-
Chromium (III)[2]	Cr (III)		< 0.2	-
Chromium (VI)	Cr (VI)		< 0.053	-
Cadmium	Cd		< 0.2	-
Cobalt	Co		< 1	-
Manganese	Mn		< 1	-
Copper	Cu		< 0.5	-
Nickel	Ni		< 1	-
Lead	Pb		< 0.5	-
Organically bound tin[3]	Sn-org. bound		< 5	-
Mercury	Hg		< 0.01	-
Selenium	Se		< 5	-
Stroncium	Sr		< 1	-
Zinc	Zn		4.3	-

[1] Results are given in mg element / kg material.
[2] Cr (III) was determined by calculation from the difference of total Chromium and Chromium (VI).
[3] Sn - organically bound was not measured due to the fact that the concentration of total tin is below the detection limit of 5 mg / kg. This value also meets the required level for organic tin ≤ 12 mg / kg.

Sample No. 92 - POLYMAR® 8556 5240 – blue (foil)				
Parameters measured		**Method**	**Results[1] mg/kg**	**Extended uncertainty in % rel.**
Antimony	Sb	Preparation of the extract: ZÚLP method Measurement: ALS method	< 5	-
Arsenic	As		< 0.9	-
Barium	Ba		< 5	-
Boron	B		< 10	-
Tin	Sn		< 5	-
Aluminium	Al		< 5	-
Chromium	Cr		< 0.2	-
Chromium (III)[2]	Cr (III)		< 0.2	-
Chromium (VI)	Cr (VI)		< 0.053	-
Cadmium	Cd		< 0.2	-
Cobalt	Co		< 1	-
Manganese	Mn		< 1	-
Copper	Cu		< 0.5	-
Nickel	Ni		< 1	-
Lead	Pb		< 0.5	-
Organically bound tin[3]	Sn-org. bound		< 5	-
Mercury	Hg		< 0.01	-
Selenium	Se		< 5	-
Stroncium	Sr		< 1	-
Zinc	Zn		1.9	-

[1] Results are given in mg element / kg material.
[2] Cr (III) was determined by calculation from the difference of total Chromium and Chromium (VI).
[3] Sn - organically bound was not measured due to the fact that the concentration of total tin is below the detection limit of 5 mg / kg. This value also meets the required level for organic tin ≤ 12 mg / kg.

The uncertainty mentioned is the extended uncertainty calculated by using the extension coefficient equalling 2 and so it corresponds to the significance level by approx. 95%.

Tests carried out by: S. Kučerová. M. Pfeiferová
ALS Czech Republic. s.r.o. (PR2120709)
Protocol completed by: M. Mrhalová. M.Sc.

Note:
Without the written consent of the testing laboratory. the report may not be reproduced other than in its entirety. and this report does not replace other documents.
The test results are valid only for the test sample and relate to the sample as received.

- TEST PROTOCOL END -