

PTS TEST REPORT

No. 35.296

Customer KLUG-CONSERVATION
Walter Klug GmbH & Co. KG
Mr. Peter Langhammer
Zollstraße 2
87509 Immenstadt
Germany

Date of order 4 August 2021

Receipt of samples 6 August 2021 **Testing period** 6 August – 20 August 2021

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Heidenau, 17 August 2021

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Laboratory Manager Material Testing

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Project manager

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1 Task and sample material

Task PTS has been assigned to test different paper samples with the following measurement method:

- Bursting strength (board) according to DIN EN ISO 2759:2014-10*
- Tensile strength / Tensile stretch according to ISO 1924-2:2009-05*
- Tearing resistance (Elmendorf) according to DIN EN ISO 1974:2012-09*

Sample material The following sample material was handed over by the client for testing:

| No. | Labelling of the samples |
|-----|---|
| 1 | 240 g/m ² Archivkarton 048, hellgrau - Charge 83820 (30 Blatt) |
| 2 | 330 g/m ² Archivkarton 047, graublau - Charge 83871-FSC (30 Blatt) |

2 Test procedure

Sample preparation The samples were stored for at least 24 hours at standard climatic conditions of 23±1°C and 50±2% rel. humidity and tested at the same climatic conditions.

Bursting strength (board) The determination of the bursting strength was executed according to DIN EN ISO 2759:2014-10 with the testing instrument SE 002 J 5-3 of the company Lorenzen & Wettre.

The material to be tested is deformed by the bulging membrane, which leads to bursting. The required pressure is measured and reported as bursting resistance in kPa.

Per side 10 measurements were made and from 20 single values one mean value was calculated.

Tensile strength / Tensile stretch The determination of the tensile strength was executed according to ISO 1924-2:2009-05 with the universal testing machine Inspekt 20 of the company Hegewald & Peschke. The measurements were done at a clamping length of 100 mm and an elongation rate of 20 mm/min.

From 10 single values per direction one mean value was calculated.

Tearing resistance (Elmendorf) The determination of the tearing resistance Elmendorf was executed according to DIN EN ISO 1974:2012-09 with the testing instrument Digi-Tear/ M 454 of Messmer & Büchel. The measurements were carried out with 4 sheets per single measurement.

From 10 single values per direction one mean value was calculated.

3 Results

Results

The results with average and standard deviation are summarized in the table below. Following abbreviations are used:

MV – mean value

MD – Machine running direction

SD – standard deviation

CD – Cross direction

n – number of single measurements

| Property | | Sample 1 | Sample 2 |
|---|----|----------|----------|
| Bursting strength (board) in kPa | MV | 770 | 1121 |
| | SD | 42 | 48 |
| | n | 20 | 20 |
| Tensile strength in kN/m | MD | MV | 13,5 |
| | | SD | 0,37 |
| | | n | 10 |
| | CD | MV | 9,24 |
| | | SD | 0,19 |
| | | n | 10 |
| Tensile stretch in % | MD | MV | 3,00 |
| | | SD | 0,20 |
| | | n | 10 |
| | CD | MV | 5,63 |
| | | SD | 0,27 |
| | | n | 10 |
| Tearing resistance ¹ in mN | MD | MV | 2320 |
| | | SD | 112 |
| | | n | 10 |
| | CD | MV | 2350 |
| | | SD | 92,8 |
| | | n | 10 |

¹⁾ During the measurement of the tearing resistance of sample 2, slippage occurred in the clamps due to the smooth surface of the sample.