

REPORT <<< A >>> (SUMMARY)

ROUND: 2023-1  
ISSUED BY: PTS

| No.    | PROPERTY                             | METHOD     | LEVEL | UNIT   | CEPI-A<br>MEAN | SD<br>WITHIN | SD<br>BETWEEN | NUMBER<br>OF QL's | WARNING LIMITS | ACTION LIMITS |        |       |
|--------|--------------------------------------|------------|-------|--------|----------------|--------------|---------------|-------------------|----------------|---------------|--------|-------|
| 1.4    | Moisture                             | ISO 287    | 1     | %      | 4,92           | 0,04         | 0,20          | 7                 | 4,51           | 5,32          | 4,39   | 5,44  |
| 1.4    | Moisture                             | ISO 287    | 2     | %      | 6,80           | 0,02         | 0,21          | 7                 | 6,37           | 7,22          | 6,24   | 7,35  |
| 2.4    | Tear growth (Brecht-Imset)           | DIN 53115  | 1     | mNm/m  | 456            | -            | 21,2          | 2                 | 414            | 499           | 401    | 512   |
| 2.4    | Tear growth (Brecht-Imset)           | DIN 53115  | 2     | mNm/m  | 911            | -            | 67,7          | 2                 | 776            | 1047          | 735    | 1087  |
| 2.4    | Tear growth (Brecht-Imset)           | DIN 53115  | 3     | mNm/m  | 1394           | -            | 106           | 2                 | 1183           | 1606          | 1119   | 1669  |
| 2.5    | Compressive strength (short span     | ISO 9895   | 1     | kN/m   | 1,55           | 0,07         | 0,07          | 9                 | 1,40           | 1,70          | 1,36   | 1,74  |
| 2.5    | Compressive strength (short span     | ISO 9895   | 2     | kN/m   | 2,97           | 0,11         | 0,17          | 9                 | 2,64           | 3,31          | 2,54   | 3,41  |
| 2.5    | Compressive strength (short span     | ISO 9895   | 3     | kN/m   | 5,47           | 0,24         | 0,15          | 9                 | 5,17           | 5,77          | 5,08   | 5,86  |
| 2.5    | Compressive strength (short span     | ISO 9895   | 4     | kN/m   | 8,62           | 0,49         | 0,30          | 9                 | 8,02           | 9,22          | 7,85   | 9,40  |
| 3.2    | Bending res. (7.5°;15°;50mm) CRD     | ISO 2493-1 | 1     | mN     | 66,2           | 1,42         | 3,42          | 9                 | 59,4           | 73,0          | 57,3   | 75,1  |
| 3.2    | Bending res. (7.5°;15°;50mm) CRD     | ISO 2493-1 | 2     | mN     | 348            | 10,5         | 17,5          | 9                 | 313            | 383           | 303    | 394   |
| 3.2    | Bending res. (7.5°;15°;50mm) CRD     | ISO 2493-1 | 3     | mN     | 1534           | 50,9         | 67,1          | 9                 | 1400           | 1668          | 1359   | 1709  |
| 3.3    | Bending stiffness static (5°; 50 mm) | ISO 5628   | 1     | mNm    | 6,21           | 0,27         | 0,34          | 9                 | 5,52           | 6,90          | 5,32   | 7,10  |
| 3.3    | Bending stiffness static (5°; 50 mm) | ISO 5628   | 2     | mNm    | 32,9           | 0,99         | 2,25          | 8                 | 28,4           | 37,4          | 27,0   | 38,7  |
| 3.3    | Bending stiffness static (5°; 50 mm) | ISO 5628   | 3     | mNm    | 266            | 7,07         | 8,26          | 8                 | 250            | 283           | 245    | 288   |
| 3.5(a) | TSO – Tensile stiffness index MD     | ---        | 1     | kNm/g  | 9,63           | 0,13         | 0,37          | 5                 | 8,88           | 10,4          | 8,66   | 10,6  |
| 3.5(a) | TSO – Tensile stiffness index MD     | ---        | 2     | kNm/g  | 10,4           | 0,14         | 0,75          | 5                 | 8,95           | 11,9          | 8,50   | 12,4  |
| 3.5(a) | TSO – Tensile stiffness index MD     | ---        | 3     | kNm/g  | 10,9           | 0,28         | 0,94          | 5                 | 9,05           | 12,8          | 8,48   | 13,4  |
| 3.5(a) | TSO – Tensile stiffness index MD     | ---        | 4     | kNm/g  | 9,76           | 0,11         | 0,57          | 5                 | 8,61           | 10,9          | 8,26   | 11,3  |
| 3.5(b) | TSO – Tensile stiffness index CD     | ---        | 1     | kNm/g  | 3,04           | 0,03         | 0,21          | 5                 | 2,62           | 3,45          | 2,50   | 3,58  |
| 3.5(b) | TSO – Tensile stiffness index CD     | ---        | 2     | kNm/g  | 6,80           | 0,08         | 0,67          | 5                 | 5,46           | 8,13          | 5,06   | 8,53  |
| 3.5(b) | TSO – Tensile stiffness index CD     | ---        | 3     | kNm/g  | 4,60           | 0,09         | 0,21          | 5                 | 4,18           | 5,02          | 4,05   | 5,15  |
| 3.5(b) | TSO – Tensile stiffness index CD     | ---        | 4     | kNm/g  | 4,40           | 0,05         | 0,13          | 5                 | 4,14           | 4,67          | 4,06   | 4,74  |
| 3.5(c) | TSO – Orientation angle              | ---        | 1     | °      | -1,70          | 0,51         | 2,09          | 5                 | -5,87          | 2,47          | -7,13  | 3,72  |
| 3.5(c) | TSO – Orientation angle              | ---        | 2     | °      | -1,19          | 1,03         | 3,65          | 5                 | -8,48          | 6,10          | -10,67 | 8,29  |
| 3.5(c) | TSO – Orientation angle              | ---        | 3     | °      | -2,67          | 0,90         | 0,91          | 5                 | -4,49          | -0,84         | -5,04  | -0,30 |
| 3.5(c) | TSO – Orientation angle              | ---        | 4     | °      | 1,67           | 1,04         | 0,54          | 5                 | 0,58           | 2,76          | 0,26   | 3,08  |
| 3.6    | Bending res. (7.5°;15°;50mm) Taber   | ISO 2493-2 | 1     | mNm    | 3,11           | 0,12         | 0,25          | 6                 | 2,61           | 3,61          | 2,46   | 3,76  |
| 3.6    | Bending res. (7.5°;15°;50mm) Taber   | ISO 2493-2 | 2     | mNm    | 16,4           | 0,35         | 0,64          | 6                 | 15,2           | 17,7          | 14,8   | 18,1  |
| 3.6    | Bending res. (7.5°;15°;50mm) Taber   | ISO 2493-2 | 3     | mNm    | 72,5           | 1,51         | 3,12          | 7                 | 66,2           | 78,7          | 64,3   | 80,6  |
| 4.1    | Smoothness Bekk                      | ISO 5627   | 1     | s      | 32,6           | 3,75         | 3,17          | 10                | 26,3           | 39,0          | 24,4   | 40,9  |
| 4.1    | Smoothness Bekk                      | ISO 5627   | 2     | s      | 150            | 4,14         | 11,5          | 10                | 127            | 173           | 121    | 180   |
| 4.1    | Smoothness Bekk                      | ISO 5627   | 3     | s      | 267            | 15,0         | 30,9          | 10                | 205            | 329           | 187    | 347   |
| 4.1    | Smoothness Bekk                      | ISO 5627   | 4     | s      | 1574           | 33,7         | 241           | 10                | 1092           | 2057          | 947    | 2201  |
| 4.2    | Roughness Bendtsen                   | ISO 8791-2 | 1     | ml/min | 57,3           | 7,60         | 10,2          | 12                | 37,0           | 77,6          | 30,9   | 83,7  |
| 4.2    | Roughness Bendtsen                   | ISO 8791-2 | 2     | ml/min | 200            | 24,8         | 20,3          | 12                | 159            | 240           | 147    | 253   |
| 4.2    | Roughness Bendtsen                   | ISO 8791-2 | 3     | ml/min | 715            | 55,8         | 47,8          | 11                | 619            | 810           | 590    | 839   |
| 4.2    | Roughness Bendtsen                   | ISO 8791-2 | 4     | ml/min | 1419           | 89,2         | 121           | 11                | 1177           | 1661          | 1105   | 1733  |
| 4.4(a) | Coefficient of friction static       | ISO 15359  | 1     | ---    | 0,41           | 0,02         | 0,05          | 6                 | 0,30           | 0,52          | 0,27   | 0,56  |
| 4.4(a) | Coefficient of friction static       | ISO 15359  | 2     | ---    | 0,52           | 0,02         | 0,10          | 5                 | 0,32           | 0,72          | 0,26   | 0,78  |

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|--------|-----------------------------------------|---------------------|-------|--------|----------------|--------------|---------------|-------------------|----------------|-------|---------------|-------|
| 4.4(b) | Coefficient of friction dynamic         | ISO 15359           | 1     | ---    | 0,29           | 0,01         | 0,01          | 5                 | 0,27           | 0,31  | 0,26          | 0,31  |
| 4.4(b) | Coefficient of friction dynamic         | ISO 15359           | 2     | ---    | 0,36           | 0,02         | 0,08          | 7                 | 0,19           | 0,53  | 0,14          | 0,58  |
| 4.5    | Coefficient of friction, inclined plane | UNI 9802, DIN 53119 | 1     | ---    | 0,42           | 0,02         | 0,02          | 4                 | 0,38           | 0,46  | 0,36          | 0,47  |
| 4.5    | Coefficient of friction, inclined plane | UNI 9802, DIN 53119 | 2     | ---    | 0,51           | 0,03         | 0,01          | 4                 | 0,50           | 0,53  | 0,49          | 0,53  |
| 4.6(a) | Contact Angle 0,1s                      | ISO 14778           | 1     | °      | 64,2           | 1,79         | 9,15          | 7                 | 45,9           | 82,5  | 40,5          | 88,0  |
| 4.6(a) | Contact Angle 0,1s                      | ISO 14778           | 2     | °      | 78,7           | 2,72         | 13,4          | 7                 | 51,8           | 105,6 | 43,8          | 113,7 |
| 4.6(a) | Contact Angle 0,1s                      | ISO 14778           | 3     | °      | 109            | 1,89         | 20,2          | 7                 | 68,3           | 149   | 56,2          | 161   |
| 4.6(b) | Contact Angle 1,0s                      | ISO 14778           | 1     | °      | 63,5           | 1,75         | 9,92          | 7                 | 43,6           | 83,3  | 37,7          | 89,2  |
| 4.6(b) | Contact Angle 1,0s                      | ISO 14778           | 2     | °      | 69,8           | 0,91         | 10,9          | 5                 | 48,0           | 91,7  | 41,4          | 98,3  |
| 4.6(b) | Contact Angle 1,0s                      | ISO 14778           | 3     | °      | 109            | 1,91         | 19,0          | 7                 | 71,4           | 147   | 60,0          | 159   |
| 4.6(c) | Contact Angle 10s                       | ISO 14778           | 1     | °      | 62,8           | 1,69         | 9,95          | 7                 | 42,9           | 82,7  | 36,9          | 88,6  |
| 4.6(c) | Contact Angle 10s                       | ISO 14778           | 2     | °      | 62,0           | 0,65         | 7,16          | 5                 | 47,7           | 76,3  | 43,4          | 80,6  |
| 4.6(c) | Contact Angle 10s                       | ISO 14778           | 3     | °      | 110            | 1,92         | 18,3          | 7                 | 73,0           | 146   | 62,0          | 157   |
| 5.2    | Air permeance Bekk                      | ---                 | 1     | s      | 7,35           | 0,54         | 1,26          | 7                 | 4,83           | 9,87  | 4,07          | 10,6  |
| 5.2    | Air permeance Bekk                      | ---                 | 2     | s      | 11,8           | 0,58         | 1,19          | 7                 | 9,40           | 14,2  | 8,68          | 14,9  |
| 5.2    | Air permeance Bekk                      | ---                 | 3     | s      | 51,2           | 2,74         | 18,8          | 6                 | 13,7           | 88,7  | 2,40          | 100,0 |
| 5.2    | Air permeance Bekk                      | ---                 | 4     | s      | 201            | 4,97         | 15,9          | 6                 | 169            | 233   | 160           | 242   |
| 5.3    | Air permeance Bendtsen                  | ISO 5636-3          | 1     | ml/min | 29,3           | 1,79         | 3,42          | 9                 | 22,5           | 36,2  | 20,4          | 38,2  |
| 5.3    | Air permeance Bendtsen                  | ISO 5636-3          | 2     | ml/min | 141            | 4,10         | 21,9          | 12                | 97,2           | 185   | 84,0          | 198   |
| 5.3    | Air permeance Bendtsen                  | ISO 5636-3          | 3     | ml/min | 495            | 31,5         | 44,4          | 12                | 406            | 584   | 379           | 610   |
| 5.3    | Air permeance Bendtsen                  | ISO 5636-3          | 4     | ml/min | 1887           | 62,6         | 225           | 12                | 1437           | 2337  | 1302          | 2473  |
| 5.4    | Air permeance Gurley                    | ISO 5636-5          | 1     | s      | 41,6           | 1,45         | 3,24          | 11                | 35,1           | 48,0  | 33,1          | 50,0  |
| 5.4    | Air permeance Gurley                    | ISO 5636-5          | 2     | s      | 76,4           | 2,10         | 6,26          | 11                | 63,8           | 88,9  | 60,1          | 92,7  |
| 5.4    | Air permeance Gurley                    | ISO 5636-5          | 3     | s      | 514            | 14,1         | 42,6          | 9                 | 428            | 599   | 403           | 624   |
| 7.1    | Kappa number                            | ISO 302             | 1     | ---    | 3,08           | 0,05         | 0,14          | 5                 | 2,80           | 3,37  | 2,71          | 3,45  |
| 7.1    | Kappa number                            | ISO 302             | 2     | ---    | 73,6           | 1,04         | 3,75          | 5                 | 66,2           | 81,1  | 63,9          | 83,4  |
| 7.2    | pH of aqueous extracts                  | ISO 6588            | 1     | ---    | 7,86           | 0,04         | 0,28          | 8                 | 7,30           | 8,42  | 7,13          | 8,58  |
| 7.2    | pH of aqueous extracts                  | ISO 6588            | 2     | ---    | 9,70           | 0,04         | 0,19          | 8                 | 9,33           | 10,1  | 9,22          | 10,2  |
| 7.3    | Alkali reserve                          | ISO 10716           | 1     | mol/kg | 0,45           | 0,01         | 0,03          | 6                 | 0,39           | 0,51  | 0,37          | 0,53  |
| 7.3    | Alkali reserve                          | ISO 10716           | 2     | mol/kg | 2,18           | 0,02         | 0,07          | 6                 | 2,05           | 2,31  | 2,01          | 2,35  |
| 7.4    | Residue (ash) at 525°C                  | ISO 1762            | 1     | %      | 1,31           | 0,01         | 0,04          | 7                 | 1,22           | 1,40  | 1,20          | 1,42  |
| 7.4    | Residue (ash) at 525°C                  | ISO 1762            | 2     | %      | 10,9           | 0,05         | 0,37          | 8                 | 10,1           | 11,6  | 9,91          | 11,8  |
| 7.5    | Residue (ash) at 900°C                  | ISO 2144            | 1     | %      | 1,27           | 0,03         | 0,02          | 6                 | 1,23           | 1,32  | 1,21          | 1,33  |
| 7.5    | Residue (ash) at 900°C                  | ISO 2144            | 2     | %      | 6,36           | 0,03         | 0,24          | 8                 | 5,87           | 6,84  | 5,73          | 6,98  |
| 9.1    | Resistance to picking IGT               | ISO 3783            | 1     | m/s    | 0,52           | -            | 0,13          | 3                 | 0,25           | 0,79  | 0,17          | 0,87  |
| 9.1    | Resistance to picking IGT               | ISO 3783            | 2     | m/s    | 1,08           | -            | 0,24          | 3                 | 0,60           | 1,57  | 0,45          | 1,71  |
| 9.2    | Print penetration IGT                   | IGT W24             | 1     | mm     | 73,3           | -            | 3,15          | 2                 | 67,0           | 79,6  | 65,1          | 81,5  |
| 9.2    | Print penetration IGT                   | IGT W24             | 2     | mm     | 135            | -            | 14,6          | 2                 | 106            | 164   | 96,8          | 173   |
| 9.12   | Dennison Wax                            | Tappi T459          | 1     | number | 7              | 0,47         | 1,99          | 5                 | 3              | 11    | 2             | 12    |
| 9.12   | Dennison Wax                            | Tappi T459          | 2     | number | 9              | 0,55         | 1,04          | 4                 | 7              | 11    | 6             | 12    |
| 9.12   | Dennison Wax                            | Tappi T459          | 3     | number | 17             | 0,55         | 0,95          | 4                 | 15             | 19    | 14            | 19    |

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|---------|-------------------------------|----------------|-------|----------|----------------|--------------|---------------|-------------------|----------------|------|---------------|------|
| 10.5(a) | Peel adhesion 180°, 300mm/min | FINAT 1, 20min | 1     | N/25     | 2,17           | 0,16         | 0,43          | 4                 | 1,30           | 3,04 | 1,04          | 3,30 |
| 10.5(a) | Peel adhesion 180°, 300mm/min | FINAT 1, 20min | 2     | N/25     | 10,0           | 0,42         | 1,31          | 4                 | 7,39           | 12,6 | 6,60          | 13,4 |
| 10.5(b) | Peel adhesion 180°, 300mm/min | FINAT 1, 24h   | 1     | N/25     | 2,46           | 0,28         | 0,30          | 4                 | 1,87           | 3,05 | 1,69          | 3,23 |
| 10.5(b) | Peel adhesion 180°, 300mm/min | FINAT 1, 24h   | 2     | N/25     | 12,1           | 0,56         | 1,32          | 4                 | 9,48           | 14,8 | 8,69          | 15,6 |
| 10.6    | Low speed release force       | FINAT 3        | 1     | cN/50    | 8,39           | -            | 6,10          | 2                 | 0,00           | 20,6 | 0,00          | 24,2 |
| 10.6    | Low speed release force       | FINAT 3        | 2     | cN/50    | 24,0           | -            | 0,04          | 2                 | 23,9           | 24,1 | 23,9          | 24,1 |
| 10.7    | 'Loop' tack measurement       | FINAT 9        | 1     | N        | 6,10           | 0,68         | 0,15          | 4                 | 5,80           | 6,40 | 5,71          | 6,49 |
| 10.7    | 'Loop' tack measurement       | FINAT 9        | 2     | N        | 13,6           | 1,10         | 2,71          | 4                 | 8,20           | 19,1 | 6,57          | 20,7 |
| 10.9    | Grease Resistance (KIT-Test)  | Tappi T559     | 1     | kit-rate | 5,9            | 0,47         | 0,93          | 4                 | 4,0            | 7,7  | 3,4           | 8,3  |
| 10.9    | Grease Resistance (KIT-Test)  | Tappi T559     | 2     | kit-rate | 8,6            | 0,27         | 0,95          | 4                 | 6,7            | 10,5 | 6,1           | 11,1 |

Signed by Ms M. Pritsche  
for PTS as a member of the  
CEPI Comparative Testing Service

Date: 23-5-2023