

## Technical Information, January 2020

# Makrolon® Overview fire classifications

### Overview classifications:

| Contribution to fire             | Europe   | Germany | France                             | GB  | Italy |
|----------------------------------|--|---------|------------------------------------|---|-------|
| <b>not burning</b>               | A1   | A1      |                                    |   | 0     |
|                                  | A2   | A2      | M0 (d0)                            |   | 0     |
| <b>low burning</b>               | B  | B1      | M1 (d0)                            | 0   | 1     |
|                                  | C  |         | M2 (d0)                            | 1   |       |
| <b>normal burning</b>            | D  | B2      | M3                                 |   | 2     |
|                                  | E  |         |                                    |   | 3     |
| <b>high burning</b>              |  | B3      | M4                                 |   | 4     |
|                                  |  |         |                                    |   | 5     |
| <b>additional classification</b> | <b>Droplets:</b><br>d0 - no droplets occur within 600s<br>d1 - no droplets, persisting >10s, occur within 600s<br>d2 - not d0 or d1 or ignites the paper in the ignitability test (EN ISO 11925-2)<br><b>Smoke:</b><br>s1 - SMOGRA* ≤ 30 m <sup>2</sup> /s <sup>2</sup> and TSP600s** ≤ 50 m <sup>2</sup><br>s2 - SMOGRA ≤ 180 m <sup>2</sup> /s <sup>2</sup> and TSP600s ≤ 200 m <sup>2</sup><br>s3 - not s1 or s2<br>* SMOGRA: Smoke Growth Rate<br>** TSP600s: Total Smoke Production within 600s |         | nbd =<br>no<br>burning<br>droplets | y : is added to the classification of all thermoplastics if any softening and/or other behaviour occurs, that may affect the flame spread (e.g. class 1y) |       |

Note: Product may change its burning behaviour due to ageing and weathering. The indicated fire rating was tested on new / unweathered Product in accordance with the indicated fire classification standards. Please verify whether Product fulfils your application requirements.

| Europe, EN 13501-1                     |         |         |         |         |         |         |
|--|---------|---------|---------|---------|---------|---------|
| Thickness (mm)                         | 1       | 2       | 3       | 4       | 5       | 6       |
| Makrolon® GP clear 099                 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 |
| Makrolon® GP white 150                 | B-s1,d0 | B-s1,d0 | B-s1,d0 |         |         |         |
| Makrolon® UV clear 2099                | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 |
| Makrolon® UV white 2150                | B-s1,d0 | B-s1,d0 | B-s1,d0 |         |         |         |
| Makrolon® UV CC 2655                   | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 | B-s1,d0 |
| Makrolon® GP / NR / UV<br>(all colors) | B-s2,d0 | B-s2,d0 | B-s2,d0 | B-s2,d0 | B-s2,d0 | B-s2,d0 |

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| Germany, DIN 4102, B-Classifications |      |           |           |           |           |           |           |   |    |    |    |
|--------------------------------------|------|-----------|-----------|-----------|-----------|-----------|-----------|---|----|----|----|
| Thickness (mm)                       | 0.75 | 1         | 2         | 3         | 4         | 5         | 6         | 8 | 10 | 12 | 15 |
| Makrolon® GP clear 099               |      | <b>B1</b> | <b>B1</b> | <b>B1</b> | <b>B1</b> | <b>B1</b> | <b>B1</b> |   |    |    |    |
| Makrolon® GP white 150               |      |           | <b>B1</b> | <b>B1</b> |           |           |           |   |    |    |    |

| Germany, DIN 5510, Preventive fire protection in railway vehicles |   |              |              |              |              |              |
|---|---|--------------|--------------|--------------|--------------|--------------|
| Thickness (mm)  | 2 | 3            | 4            | 5            | 6            | 8            |
| Makrolon® GP clear 099  |   | S3, SR2, ST1 | S3, SR2, ST1 | S3, SR2, ST1 | S3, SR2, ST1 | S3, SR2, ST1 |
| Makrolon® FR clear 099  |   |              |              | S3, SR2, ST2 |              |              |

S = Fire behaviour :

S4 : damaged length <20 cm

S3 : damaged length <25 cm

S2 : damaged length <30 cm

SR = Smoke development

SR2 : Integral of light reduction <50% min

SR1: Integral of light reduction <100% min

ST : Burning droplets

ST2 : no droplets or no burning droplets

ST1 : burning droplets

| France, NF P 92-501, -504 & -505 (M-classification), NF F 16-101 & -102 (F-classification) |      |    |    |    |    |    |    |    |    |    |    |
|--|------|----|----|----|----|----|----|----|----|----|----|
| Thickness (mm)   | 0.75 | 1  | 2  | 3  | 4  | 5  | 6  | 8  | 10 | 12 | 15 |
| Makrolon® GP clear 099   |      | M2 | M2 | M2 | M2 | M2 | M2 | M2 | M2 | M2 | M2 |
|  |      | F1 | F1 | F1 | F1 | F1 | F1 | F1 | F1 | F1 | F1 |
| Makrolon® UV clear 2099  |      |    | M2 | M2 | M2 | M2 | M2 | M2 | M2 | M2 | M2 |
|  |      |    | F2 | F2 | F2 | F2 | F2 | F2 | F2 | F2 | F2 |
| Makrolon® UV bronze 2850   |      |    |    | M2 | M2 | M2 | M2 |    |    |    |    |
|  |      |    |    | F1 | F1 | F1 | F1 |    |    |    |    |
| Makrolon® AR clear 8099  |      |    | M2 | M2 | M2 | M2 | M2 | M2 | M2 | M2 |    |
|  |      |    | F1 | F1 | F1 | F1 | F1 | F1 | F1 | F1 |    |

| UK, BS 476, part 7         |      |   |    |    |    |    |    |   |    |    |
|----------------------------|------|---|----|----|----|----|----|---|----|----|
| Thickness (mm)             | 0.75 | 1 | 2  | 3  | 4  | 5  | 6  | 8 | 10 | 12 |
| Makrolon® UV clear 2099    |      |   | 1y | 1y | 1y |    | 1y |   |    | 1y |
| Makrolon® UV white 2130    |      |   |    |    |    | 1y |    |   |    |    |
| Makrolon® UV CC green 2655 |      |   |    | 1y |    |    |    |   |    | 1y |

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| USA, UL 94              |      |    |    |    |    |    |    |    |    |    |    |  |
|-------------------------|------|----|----|----|----|----|----|----|----|----|----|--|
| Thickness (mm)          | 0.75 | 1  | 2  | 3  | 4  | 5  | 6  | 8  | 10 | 12 | 15 |  |
| Makrolon® GP clear 099  | V2   | V2 | HB | HB | HB | HB | HB | HB | V0 | V0 | V0 |  |
| Makrolon® UV clear 2099 | V2   | V2 | HB | HB | HB | HB | HB | HB | V0 | V0 | V0 |  |
| Makrolon® AR clear 8099 | V2   | V2 | HB | HB | HB | HB | HB | HB | V0 | V0 | V0 |  |
| Makrolon® FR clear 099  |      |    | V0 | V0 | V0 | V0 | V0 | V0 | V0 | V0 | V0 |  |

| Belgium, NBN S 21-203, acc. to BS 476 part 7 |      |   |    |    |    |    |    |   |    |    |    |
|--|------|---|----|----|----|----|----|---|----|----|----|
| Thickness (mm)                               | 0.75 | 1 | 2  | 3  | 4  | 5  | 6  | 8 | 10 | 12 |    |
| Makrolon® UV clear 2099                      |      |   | A1 | A1 | A1 |    | A1 |   |    |    | A1 |
| Makrolon® UV white 2130                      |      |   |    |    |    | A1 |    |   |    |    |    |
| Makrolon® UV CC green 2655                   |      |   |    | A1 |    |    |    |   |    |    | A1 |

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