



# Makrolon® Rx2435

## Grades / Medical devices

MVR (300 °C/1.2 kg) 23 cm³/10 min; medical devices; suitable for sterilization with high-energy radiation; biocompatible according to many ISO 10993-1 test requirements; low viscosity; easy release; injection molding - melt temperature 280 - 320 °C; transparent parts for medical devices

## ISO Shortname

PC

| Property                                            | Test Condition                                    | Unit                | Standard                       | typical Value |
|-----------------------------------------------------|---------------------------------------------------|---------------------|--------------------------------|---------------|
| <b>Rheological properties</b>                       |                                                   |                     |                                |               |
| C Melt volume-flow rate                             | 300 °C/ 1.2 kg                                    | cm³/10 min          | ISO 1133                       | 23            |
| Melt mass-flow rate                                 | 300 °C/ 1.2 kg                                    | g/10 min            | ISO 1133                       | 20            |
| C Molding shrinkage, parallel                       | 60x60x2 mm/ 500 bar                               | %                   | ISO 294-4                      | 0.65          |
| C Molding shrinkage, normal                         | 60x60x2 mm/ 500 bar                               | %                   | ISO 294-4                      | 0.65          |
| Molding shrinkage, parallel/normal                  | Value range based on general practical experience | %                   | b.o. ISO 2577                  | 0.5 - 0.7     |
| <b>Mechanical properties (23 °C/50 % r. h.)</b>     |                                                   |                     |                                |               |
| C Tensile modulus                                   | 1 mm/min                                          | MPa                 | ISO 527-1,-2                   | 2400          |
| C Yield stress                                      | 50 mm/min                                         | MPa                 | ISO 527-1,-2                   | 67            |
| C Yield strain                                      | 50 mm/min                                         | %                   | ISO 527-1,-2                   | 6.1           |
| C Nominal strain at break                           | 50 mm/min                                         | %                   | ISO 527-1,-2                   | > 50          |
| Stress at break                                     | 50 mm/min                                         | MPa                 | ISO 527-1,-2                   | 70            |
| Strain at break                                     | 50 mm/min                                         | %                   | b.o. ISO 527-1,-2              | 120           |
| Flexural modulus                                    | 2 mm/min                                          | MPa                 | ISO 178                        | 2400          |
| Flexural strength                                   | 2 mm/min                                          | MPa                 | ISO 178                        | 100           |
| Flexural strain at flexural strength                | 2 mm/min                                          | %                   | ISO 178                        | 7.0           |
| Flexural stress at 3.5 % strain                     | 2 mm/min                                          | MPa                 | ISO 178                        | 74            |
| C Charpy impact strength                            | 23 °C                                             | kJ/m²               | ISO 179/1eU                    | N             |
| Charpy impact strength                              | -60 °C                                            | kJ/m²               | ISO 179/1eU                    | N             |
| Charpy notched impact strength                      | 23 °C/ 3 mm                                       | kJ/m²               | ISO 21305/based on ISO 179/1eA | 75P           |
| Charpy notched impact strength                      | -30 °C/ 3 mm                                      | kJ/m²               | ISO 21305/based on ISO 179/1eA | 12C           |
| Izod notched impact strength                        | 23 °C/ 3 mm                                       | kJ/m²               | ISO 21305/based on ISO 180/A   | 60P           |
| Izod notched impact strength                        | -30 °C/ 3 mm                                      | kJ/m²               | ISO 21305/based on ISO 180/A   | 12C           |
| C Puncture impact properties - maximum force        | 23 °C                                             | N                   | ISO 6603-2                     | 5100          |
| C Puncture impact properties - maximum force        | -30 °C                                            | N                   | ISO 6603-2                     | 6000          |
| C Puncture energy                                   | 23 °C                                             | J                   | ISO 6603-2                     | 55            |
| C Puncture energy                                   | -30 °C                                            | J                   | ISO 6603-2                     | 65            |
| Ball indentation hardness                           |                                                   | N/mm²               | ISO 2039-1                     | 118           |
| <b>Thermal properties</b>                           |                                                   |                     |                                |               |
| C Temperature of deflection under load              | 1.80 MPa                                          | °C                  | ISO 75-1,-2                    | 120           |
| C Temperature of deflection under load              | 0.45 MPa                                          | °C                  | ISO 75-1,-2                    | 132           |
| C Vicat softening temperature                       | 50 N; 50 °C/h                                     | °C                  | ISO 306                        | 139           |
| Vicat softening temperature                         | 50 N; 120 °C/h                                    | °C                  | ISO 306                        | 140           |
| C Coefficient of linear thermal expansion, parallel | 23 to 55 °C                                       | 10 <sup>-4</sup> /K | ISO 11359-1,-2                 | 0.65          |
| C Coefficient of linear thermal expansion, normal   | 23 to 55 °C                                       | 10 <sup>-4</sup> /K | ISO 11359-1,-2                 | 0.65          |
| Thermal conductivity, through-plane                 | 23 °C; 50 % r. h.                                 | W/(m·K)             | ISO 8302                       | 0.20          |
| Resistance to heat (ball pressure test)             |                                                   | °C                  | IEC 60695-10-2                 | 132           |
| Flash ignition temperature                          |                                                   | °C                  | ASTM D1929                     | 480           |
| Self ignition temperature                           |                                                   | °C                  | ASTM D1929                     | 550           |





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| Property                                            | Test Condition    | Unit  | Standard   | typical Value |
|-----------------------------------------------------|-------------------|-------|------------|---------------|
| <b>Other properties (23 °C)</b>                     |                   |       |            |               |
| C Water absorption (saturation value)               | Water at 23 °C    | %     | ISO 62     | 0.30          |
| C Water absorption (equilibrium value)              | 23 °C; 50 % r. h. | %     | ISO 62     | 0.12          |
| C Density                                           |                   | kg/m³ | ISO 1183-1 | 1200          |
| Bulk density                                        | Pellets           | kg/m³ | ISO 60     | 660           |
| <b>Processing conditions for test specimens</b>     |                   |       |            |               |
| C Injection molding - Melt temperature              |                   | °C    | ISO 294    | 280           |
| C Injection molding - Mold temperature              |                   | °C    | ISO 294    | 80            |
| C Injection molding - Injection velocity            |                   | mm/s  | ISO 294    | 200           |
| <b>Recommended processing and drying conditions</b> |                   |       |            |               |
| Melt temperatures                                   |                   | °C    | -          | 280 - 320     |
| Standard Melt temperature                           |                   | °C    | -          | 300           |
| Barrel Temperatures - Rear                          |                   | °C    | -          | 250 - 260     |
| Barrel Temperatures - Middle                        |                   | °C    | -          | 270 - 280     |
| Barrel Temperatures - Front                         |                   | °C    | -          | 280 - 290     |
| Barrel Temperatures - Nozzle                        |                   | °C    | -          | 290 - 300     |
| Mold Temperatures                                   |                   | °C    | -          | 80 - 120      |
| Hold Pressure (% of injection pressure)             |                   | %     | -          | 50 - 75       |
| Plastic Back Pressure (specific)                    |                   | bar   | -          | 50 - 150      |
| Peripheral Screw Speed                              |                   | m/s   | -          | 0.05 - 0.2    |
| Shot-to-Cylinder Size                               |                   | %     | -          | 30 - 70       |
| Dry Air Drying Temperature                          |                   | °C    | -          | 120           |
| Dry Air Drying Time                                 |                   | h     | -          | 2-3           |
| Moisture Content max. (%)                           |                   | %     | -          | <= 0,02       |
| Vent Depth                                          |                   | mm    | -          | 0.025 - 0.075 |

C These property characteristics are taken from the CAMPUS plastics data bank and are based on the international catalogue of basic data for plastics according to ISO 10350.

Impact properties: N = non-break, P = partial break, C = complete break

