# RESINS FOR FLOORING

## METHYL METHACRYLATE FLOORING SYSTEMS

HELIOS RESINS | ATCOAT

# HIGH-QUALITY RESINS FOR ADVANCED COATING SOLUTIONS.



## RESINS FOR FLOORING

OUR RESINS FOR FLOORING OFFER GREAT DURABILITY EVEN IN EXTREME CONDITIONS.

### GOLDEN RESINS

We produce around 70,000 tons of liquid resins annually, including coating and composite resins. Our coating resin brands – DOMACRYL, DOMOPOL, DOMALKYD, DOMEMUL, DOMOPUR, ATRESIN, ATRELUX and ATRETHIX – have achieved a strong market position and are trusted for their quality and performance. With the combined strength of two strong production companies, ATCOAT and Helios Resins, we serve more than 50 countries worldwide. Our production sites in Germany and Slovenia allow us to deliver our quality resins throughout Europe and beyond. A broad product portfolio, intensive R&D and innovation capabilities, high production flexibility, and superior customer service are the strengths of Helios Resins and ATCOAT as a joint specialist for synthetic resins.

### RESPONSIBLE MATERIAL DEVELOPMENT

By developing advanced and long-lasting materials and technolgies, we work to reduce the use of hazardous organic solvents, incorporate bio-renewable raw materials, and create a potential for energy savings. Our product and technology development activities encompass the production of bio-based materials, water-based resins, high solids technologies, BPA-NI resins (without addeed Bisphenol A), recycling solutions, and participation in EU initiatives. We are the first in Slovenia to be ISCC Plus certified and offer several products made from **ISCC PLUS-certified** raw materials certified throughout the value chain back to the point of origin. We are proud to see this reflected in the **EcoVadis Platinum Medal** we received in recognition of our corporate responsibility and sustainability management practices.

### DEVELOPED WITH ADVANCED TECHNOLOGIES

Our laboratories and production facilities are fully equipped with the most advanced technologies, which enables the development and production of even the most complex solvent and waterborne resins. Our R&D has advanced skills as well as equipment for polyester and acrylic chemistry, including synthesis under pressure. By continually upgrading our production lines and expanding our production capacities, we can meet the most rigorous and complex needs and demands of our customers.

### QUALITY OF SERVICE

We are committed to providing a flexible and reliable service while satisfying our customers' specific requests. Helios Resins and ATCOAT ensure the quality, stability and reproducibility of every delivery. Our extensive know-how, resulting from more than 100 years of experience, enables us to provide solutions to our customers' challenges. We produce tailormade resins for specific needs and offer support in developing customized applications.

## VERSATILE AND DURABLE RESINS

Methyl methacrylate (MMA) systems provide versatile flooring options, especially suitable for areas where a quick return to service is needed. The system of three resins (primer, base coat, and topcoat) can be applied at the temperatures below 0 °C, and it offers the durability to withstand even extreme conditions.

### USE OF MMA FLOORING SYSTEMS

- Food processing facilities
- Retail
- Pool decks
- Driveways and walkways
- Sports and educational facilities
- Hotels and restaurants
- Industrial facilities
- Laboratories

### BENEFITS OF MMA FLOORING

- UV stability
- Low maintenance
- Excellent chemical, water, and abrasion resistance
- Very fast curing, even at low temperatures
- Outstanding strength capabilities
- Low degradation
- Slip resistance
- Antimicrobial properties
- Low VOC



## PRIMER

**Ready to use primer based on Domacryl 9922**

- Low viscosity hard resin for concrete and screed surfaces.
- Domacryl 9922 contains paraffin wax which tends to float after prolonged storage. The resin must be homogenized before use by stirring.
- Domacryl 9922 is amine pre-activated.
- Domacryl 9922 is hardened using benzoyl peroxide (BPO).

**Physical characteristics of resin as delivered at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **APPEARANCE** | Opaque liquid | |
| **VISCOSITY** | 80 - 100 mPas | MH1007 / ISO 3219 |
| **DENSITY** | 0.98 kg/L | MH1028 / ISO 2811 |

**Characteristics of resin cured with 2% BPO at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **SHORE A** | ≥ 90 units | ISO 868 |
| **SHORE D** | 50 - 60 units | ISO 868 |
| **BOND STRENGTH ON CONCRETE** | ≥ 4.0 MPa; Failure type: A/B | ISO 1542 |

**Hardener dosage and pot-life**

| TEMPERATURE* | WEIGHT [%] in respect to resin** | POT LIFE [min] | CURING TIME [min] |
|---|---|---|---|
| 0 °C | 5 | 13 - 15 | 50 - 60 |
| 10 °C | 3 | 10 - 12 | 40 - 50 |
| 20 °C | 2 | 8 - 10 | 30 - 35 |
| 30 °C | 1 | 5 - 6 | 20 - 30 |

*Temperature refers to air, substrate and resin temperature.
**To ensure proper curing and satisfactory properties, we recommend using minimum 2% BPO.

**Application**

- Surface to be coated needs to be completely dry, concrete moisture content must be under 4.0 CM% and properly prepared by means of shot blasting, grinding etc... Any dust, oil, grease, and other contaminants must be thoroughly removed.
- BPO is stirred in before use, always stir for at least one minute to ensure proper homogenization.
- Whole content is poured (400 - 500 g/m²) on the substrate, distributed by a squeegee and rolled out to ensure a continuous film.
- Highly absorbent substrates need to be coated twice.
- Always use proper air ventilation.

## BASECOAT

**Basecoat based on Domacryl 9948**

- Medium viscosity elastic resin suitable for areas exposed to wet and dry conditions, indoors and outdoors.
- Domacryl 9948 contains paraffin wax which tends to float after prolonged storage. Resin must be homogenized before use by stirring.
- Domacryl 9948 is amine pre-activated.
- Suitable for mortar, self-leveling and broadcast floor coatings.

**Physical characteristics of resin as delivered at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **APPEARANCE** | Opaque liquid | |
| **VISCOSITY** | 180 - 200 mPas | MH1007 / ISO 3219 |
| **DENSITY** | 0.98 kg/L | MH1028 / ISO 2811 |

**Characteristics of resin cured with 2% BPO at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **SHORE A** | 80 - 90 units | ISO 868 |
| **SHORE D** | 35 - 50 units | ISO 868 |

**Hardener dosage and pot-life of pure resin**

| TEMPERATURE* | WEIGHT [%] in respect to resin** | POT LIFE [min] | CURING TIME [min] |
|---|---|---|---|
| 0 °C | 5 | 24 - 26 | 80 - 90 |
| 10 °C | 3 | 22 - 24 | 60 - 70 |
| 20 °C | 2 | 17 - 19 | 45 - 50 |
| 30 °C | 1.5 | 9 - 11 | 30 - 40 |

*Temperature refers to air, substrate and resin temperature.
**To ensure proper curing and satisfactory properties, we recommend using minimum 1.5% BPO.



**Starting point formulation**

| NO. | COMPONENT | WEIGHT [%] | MATERIAL TYPE | SUPPLIER |
|---|---|---|---|---|
| 1. | **DOMACRYL 9948** | 60 | MMA resin | 1 |
| 2. | **RHEOBYK D-410** | 0.2 | Rheology additive | 2 |
| 3. | **BYK-1790** | 0.7 | Defoamer | 2 |
| 4. | **BYK-W-969** | 0.2 | Wetting and dispersing additive | 2 |
| 5. | **TIO2 RC-82** | 4 | Pigment | 3 |
| 6. | **DORSILIT 16.900** | 34.8 | Filler | 4 |
| 7. | **TEGO FLOW 425** | 0.1 | Surface additive | 5 |
| | Total | 100 | | |

**Preparation**

Mix components **1** and **2** under high shear forces for 10 minutes. Add component **3** under mixing and disperse for 10 minutes. Add component **4** under mixing and homogenize for 5 minutes. Mix in components **5, 6** and **7** under constant stirring and homogenize for 10 minutes.

**2–4 mm self levelling coating for medium duty flooring (1.53 kg per mm thickness)**

| NO. | HARDENER | WEIGHT % |
|---|---|---|
| 1. | **Starting point formulation** | 65 |
| 2. | **Quartz sand 0.1 - 0.5 mm** | 35 |

**3–5 mm self levelling coating for heavy duty flooring (1.67 kg per mm thickness)**

| NO. | HARDENER | WEIGHT % |
|---|---|---|
| 1. | **Starting point formulation** | 50 |
| 2. | **Quartz sand 0.1 - 0.5 mm** | 30 |
| 3. | **Quartz sand 0.4 - 0.8 mm** | 20 |

**Characteristics of medium duty starting point formulation cured with 2.0% BPO at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **SHORE A** | ≥ 90 units | ISO 868 |
| **SHORE D** | 55 - 65 units | ISO 868 |
| **BOND STRENGTH*** | ≥ 3.9 MPa; Failure type: A/B | ISO 1542 |

*Applied on concrete with a layer of Domacryl 9922 primer and a layer of Domacryl 9967 topcoat.

**Hardener**

| NO. | HARDENER | WEIGHT [%] in respect to resin** | POT LIFE [min] | CURING TIME [min] |
|---|---|---|---|---|
| 1. | **BENZOYL PEROXIDE (BPO)** | 2 | 15–20 | 45–50 |

**Application**

- Basecoat is always applied to pre-primed surfaces. Surface must be clean, free from dust or other contaminants and concrete moisture content must be under 4.0 CM%.
- Quartz sand is stirred in for 1 minute before hardener is added.
- BPO is stirred in before use, always stir for at least one minute to ensure proper homogenization.
- Whole content is poured onto the substrate, distributed by a notched squeegee and rolled with a spiked roller to release any trapped air bubbles.
- Basecoat can be broadcast with sand.
- Always use proper air ventilation.

## TOPCOAT

**Ready to use topcoat based on Domacryl 9967**

- Medium-high viscosity, hard methacrylate resin.
- Domacryl 9967 contains paraffin wax which tends to float after prolonged storage. Resin must be homogenized before use by stirring.
- Domacryl 9967 is amine pre-activated.
- High abrasion resistance.

**Physical characteristics of resin as delivered at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **APPEARANCE** | Bluish opaque liquid | |
| **VISCOSITY** | 300 - 400 mPas | MH1007 / ISO 3219 |
| **DENSITY** | 0.98 kg/L | MH1028 / ISO 2811 |

**Characteristics of resin cured with 2% BPO at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **SHORE A** | ≥ 90 units | ISO 868 |
| **SHORE D** | 70 - 80 units | ISO 868 |
| **BOND STRENGTH*** | ≥ 3.9 MPa; Failure type: A/B | ISO 1542 |
| **WEAR RATE; TABER ABRASION** | 1.42 mg/cycle | ASTM D-4060 |
| **CHEMICAL RESISTANCE** | See lower page | EN 13529 |

*Applied on concrete coated with Domacryl 9922 primer and medium-load starting point formulation made from Domacryl 9948.

**Hardener dosage and pot-life of pure resin**

| TEMPERATURE* | WEIGHT [%] in respect to resin** | POT LIFE [min] | CURING TIME [min] |
|---|---|---|---|
| 0 °C | 5 | 24 - 26 | 80 - 90 |
| 10 °C | 3 | 23 - 25 | 70 - 80 |
| 20 °C | 1.5 | 18 - 20 | 45 - 50 |
| 30 °C | 1.5 | 7 - 9 | 30 - 40 |

*Temperature refers to air, substrate and resin temperature.
**To ensure proper curing and satisfactory properties, we recommend using minimum 1.5% BPO.



**Starting point formulation**

| NO. | COMPONENT | WEIGHT [%] | MATERIAL TYPE | SUPPLIER |
|---|---|---|---|---|
| 1. | **DOMACRYL 9967** | 89.4 | MMA resin | 1 |
| 2. | **RHEOBYK D-410** | 0.15 | Rheology additive | 2 |
| 3. | **BYK-1790** | 0.4 | Defoamer | 2 |
| 4. | **BYK W-969** | 0.05 | Wetting and dispersive additive | 2 |
| 5. | **$TIO_2$ RC 82** | 10 | Pigment | 3 |
| | Total | 100 | | |

Mix components **1** and **2** under high shear forces for 10 minutes. Add component **3** under mixing and disperse for 20 minutes. Add component **4** under mixing and homogenize for 5 minutes. Mix in component **5** and disperse for 20 minutes.

**Note:** Component 1 can be added in two portions, one at the start and the rest after pigment dispersion, if preferred that way to prevent overspill due to high load of material at the beginning of homogenization.

**Characteristics of starting point formulation cured with 1.5% BPO at 20 °C**

| PROPERTY | RANGE | METHOD / ACCORDING TO STANDARD |
|---|---|---|
| **SHORE A** | ≥ 90 units | ISO 868 |
| **SHORE D** | 70 - 80 units | ISO 868 |
| **BOND STRENGTH*** | ≥ 3.0 MPa; Main failure type: A/B and B/C | ISO 1542 |
| **WEAR RATE; TABER ABRASION** | 1.67 mg/cycle | ASTM D-4060 |
| **CHEMICAL RESISTANCE** | See lower page | EN 13529 |

*Applied on concrete with a layer of Domacryl 9922 primer.

**Hardener**

| NO. | HARDENER | WEIGHT [%] in respect to resin** | POT LIFE [min] | CURING TIME [min] |
|---|---|---|---|---|
| 1. | **BENZOYL PEROXIDE (BPO)** | 1.5 | 15 - 20 | 35 - 45 |

**Application**

- Topcoat can be applied on top of fully cured basecoat for medium to high duty floors or directly onto cured primer for lower load floors (walkways etc.). Surface must be clean, free from dust or other contaminants and concrete moisture content must be under 4.0 CM%.
- BPO is stirred in before use, always stir for at least one minute to ensure proper homogenization.
- To achieve good curing, topcoat is applied in a thickness of at least 0.4 (400 g/m2) to 0.8 mm (800 g/m2).
- The whole content is poured onto the substrate, distributed by a squeegee, and back rolled to ensure a continuous film.
- Always use proper air ventilation.

| SUPPLIER | MARK IN ABOVE TABLES |
|---|---|
| **Helios Resins (www.resinshelios.com)** | **1** |
| BYK | 2 |
| CINKARNA Celje d.d. | 3 |
| Gebrüder Dorfner GmbH & Co | 4 |
| Evonik | 5 |

**Chemical resistance test (material cured at room conditions and with 2% BPO in respect to resin)**

All tests were performed at room conditions (approx. 23 °C and 50% humidity). Test results serve as guidelines and deviations from them are to be expected. We recommend customers perform their own tests according to their own requirements for more representative results.

Higher temperatures can cause chemicals to react more aggressively with coating materials. In some cases, exposure to substances can lead to discolouration of coating without attacking the coating.

| TEST SUBSTANCE | DOMACRYL 9967 | DOMACRYL 9967 Starting point formulation |
|---|---|---|
| **DRINKS AND BEVERAGES** | | |
| Tap water | + | + |
| Beer | + | + |
| Whisky – 40 vol% | + | + |
| Red wine | + | + |
| Coca cola™ | + | + |
| Strawberry juice | + | + |
| Milk | + | + |
| Black coffee | + | + |
| **CLEANING AGENTS** | | |
| PETRA™ (Dr. Schnell) | + | + |
| Ajax™ floor cleaner | + | + |
| Cilit Bang™ | + | + |
| Solid soap solution | + | + |
| Bleach | + | + |
| **OILS/GREASES AND FOOD STUFFS** | | |
| Paraffin oil | + | + |
| Hydraulic oil | + | + |
| Motor oil | + | + |
| Diesel | + | + |
| Gasoline – unleaded | + | + |
| Pumpkin seed oil | O | + |
| Tuna oil | + | + |
| Lard | + | + |
| White distilled vinegar 9% | + | + |



| TEST SUBSTANCE | DOMACRYL 9967 | DOMACRYL 9967 Starting point formulation |
|---|---|---|
| **ACIDS AND BASES** | | |
| Phosphoric acid 30% | + | + |
| Sulphuric acid 30% | + | + |
| Nitric acid 30% | – | – |
| Hydrochloric acid 37% | O | O |
| Acetic acid – glacial | – | – |
| Citric acid 30% | + | + |
| Ammonia solution 12.5% | + | O |
| Potassium hydroxide 30% | + | + |
| Sodium hydroxide 30% | + | + |
| Triethylamine in water 5% | – | O |
| **CHEMICALS AND SOLVENTS** | | |
| Distilled water | + | + |
| Hydrogen peroxide 35% | + | O |
| Ethanol 96% | O | O |
| Glycerol | + | + |
| Acetone | – | – |
| Ethyl acetate | – | – |
| Xylene | – | – |
| Hexane | O | + |
| Petroleum ether | O | O |

| INTERPRETATION OF RESULTS | | |
|---|---|---|
| + | High resistance | Prolonged exposure to test substance does not damage the coating. |
| O | Limited resistance | Prolonged exposure can cause swelling, softening or discolouration of the coating, but short-term exposure is possible. |
| – | No resistance | Even short-term or brief exposure to test substance can damage the coating. |

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