TECHNICAL INFORMATION

# SWARCOTHERM HP 62 / HP 62E

swarco

Road Marking Systems

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# SWARCOTHERM HP 62 / HP 62E

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**Important information:**
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# 1 Main characteristics / field of application

**SWARCOTHERM HP 62 / HP 62E...**

- belongs to the group of thermoplastic substances and is processed as an overlaid or inlaid marking
- thrives like all thermoplastics from wear and tear caused by roll-overs and the exposure of premix beads
- is approved with test certificates as a type I marking by the Federal Highway Research Institute (BASt)
- is highly suitable for all bituminous surfaces sand suitable for concrete surfaces (with primer)
- can be processed with conventional thermoplastic laying machines:
  - **SWARCOTHERM** HP 62 overlaid by screed box and extruder
  - **SWARCOTHERM** HP 62E overlaid and inlaid by screed box, not extrudable

# 2 Technical information

| | |
|---|---|
| **Colour** | white |
| **Density** | approx. 1.880 kg/l +/- 0.1 |
| **Softening point** | approx. 95°C |
| **Flash point** | above 240°C |
| **Solvent content** | solvent-free |
| **Storage stability** | 6 months in original packaging<br>protect against frost, moisture and direct sunlight |
| **Trafficability / Cool-off time** | A few minutes after application, depending on the air and surface temperature and the layer thickness. The markings must be inspected for their trafficability before being released for traffic. |
| **Standard packaging** | **SWARCOTHERM HP 62 / HP 62E:**<br>Powder goods in meltable PE bags on Euro pallets with 1,008 kg.<br>The PE bags are part of the recipe and are also melted in the thermal cooker.<br>**Drop-on material:** Paper bags with PE inlay - 25 kg filling weight |
| **Labelling** | The applicable regulations and instructions for proper transport, handling and storage, first aid, toxicology and ecology are described in detail in the safety data sheets and on the labels, marked and must be observed. |
| **Application temperature** | min. + 5°C |
| **Surface temperature** | + 5°C to + 45°C |
| **Relative air humidity** | maximum 75% (see the dew point table!) |
| **Laying temperature** | 160°C - 220°C |
| **Layer thicknesses** | overlaid: from 3 mm |
| **Theoretical consumption** | approx. 6.0 kg/m² or approx. 2.0 kg/m² per 1 mm layer thickness<br>The actual consumption depends on the applied layer thickness, the application technique (extruder or screed box) and the type and condition of the surface. |

# 3 Processing instructions

## 3.1 Preparing the material and application technique

### 3.1.1 Preparing the thermoplastic

The empty or party filled, cooled-off thermal cooker should be preheated for 10 - 15 minutes before filling. The cooker must then be filled up to approx. 1/3 of its capacity with the powder mass including the PE bag and the heating process should be continued. As soon as the agitator can be turned, you can commence the stirring process to comprehensively melt and homogenise the refilled powder mass. Afterwards, the powder mass is continually added into the cooker and melted until the required fill level is achieved. This process enables the shortest possible melting times.

**Attention:** The thermoplastic is only ready for processing when the specified laying temperature has been reached and the compound has melted homogeneously.
The upper limit of the specified laying temperature must not be exceeded, otherwise the binding agent will be damaged or the flash point may be reached. The thermoplastic compound becomes darker (low Qd value) and hardens, it becomes cracked and brittle.

### 3.1.2 Preparing the application technique

The exact machine settings must be made in accordance with the instructions of the machine manufacturer. Layer thicknesses and drop-on material quantities in accordance with the BASt test certificate must be observed. Ensure that the material and sprinkling drop-on material are distributed evenly over the entire applied surface / strip. The loss of drop-on material to the right / left of the applied strip must be compensated for through the appropriate machine settings.

The theoretical material consumption of material and drop-on material can be found:

- in the respective BASt test certificates
- in table 1 "Turntable road-marking test system (RPA) - BASt test certificates", section 6.2 of this technical information in kg/m²
- in the table "Theoretical material and drop-on material consumption" on our homepage in kg/km of the strip to be marked depending on typical strip widths

## 3.2 Optimising the processability of the material

The relationship between the laying temperature and the air and surface temperature has a significant influence on the laying viscosity of the thermoplastic and is therefore decisive for the quality of the finished marking, for optimum bead embedding and for the durability (adhesion) of the application as a whole.
Optimal processing conditions for the thermoplastic can therefore only be achieved by adjusting the laying temperature accordingly. The natural cooling of the compound from the cooker through to laying, depending on the application method, must also be factored in.
It is also necessary to conduct regular temperature checks of the melting process both in the cooker and during application.
In general, the following applies: for surface temperatures in the upper limit range, a laying temperature in the lower specified temperature range is sufficient. At surfaces temperatures in the lower temperature range, the laying temperature must be in the upper temperature range to prevent subsequent cracking.
At air and surface temperatures < 5°C, it is necessary to preheat the surface by means of a hot air dryer in order to achieve good adhesion.

**Attention:** Adhesion problems may arise:

- when preheating the surface with an open flame through overheating and damage to the surface layer, or due to rising humidity from the structure of the surface through capillary action.
- through condensation water that forms between the surface and the applied thermoplastic mass depending on the temperature and humidity.

The dew point table can be used to determine the surface temperature at which the air humidity condenses.
An adhesion check is mandatory in the aforementioned cases. Damp surfaces cause strong blistering in the applied thermoplastic, as a result of which the marking peels off and is destroyed due to weather influence (moisture and frost).

Due to its chemical composition, the thermoplastic can be re-plasticised at high air and surface temperatures (warming up). Resulting imprints, e.g. from tyre profiles of parked vehicles in the marking, do not constitute a defect in the sense of the warranty. If necessary, other products (e.g. cold plastic) must be selected in coordination with the customer in such exceptional cases.

# 4 Surfaces / surface pre-treatment

## 4.1 General information

The surface must be dry, clean, free of dust, oil, grease, loose particles and other impurities. The surface and any existing old markings must be checked for load-bearing capacity and compatibility with the marking material to be applied. In case of doubt, test markings / adhesion samples must be carried out. If necessary, old markings must be removed using suitable mechanical methods.

## 4.2 Concrete or cement-bound surfaces

Surface components that impair adhesion, such as fine mortar layers / concrete sludge or subsequently sprayed-on retarders with new concrete surfaces must be removed using suitable methods (e.g. high-pressure water, precision milling, or similar). On newly washed concrete road surfaces (with grit), adhesion problems may still arise that are not caused by the marking substance / primer. We recommend making test markings and to report any concerns that should arise.

Concrete or cement-bound surfaces are generally not ideal surfaces for thermoplastic road marking materials.
Before applying the thermoplastic, the concrete surface must be pre-treated with **primer for thermoplastic.** Ensure that the concrete surface is sufficiently wetted with primer to achieve an optimal adhesion of the thermoplastic. The consumption of primer depends on the porosity of the concrete and can vary, the process must be repeated if necessary. The primer should have sufficient time for the solvent to aerate before the final application of the thermoplastic. The airing time depends on the porosity of the surface and the resulting thickness of the primer layer. 30 minutes should generally be sufficient (ideal: finger test slightly sticky).
The moisture of the concrete must not exceed 4% when marking. We recommend a waiting period of at least 48 hours after rain.

## 4.3 Bituminous surfaces

All loose elements such as grit must be removed. The existing chemical additives on the surface of new bituminous surfaces (flux oils, oleiferous separating agents for rollers and similar) are principally detrimental to the adhesion of subsequent coats and can lead to a discolouration of the marking. Years of practical experience have shown that thermoplastics are suitable for application on new bituminous surfaces due to similar physical and chemical properties of the binding agent of thermoplastics and bituminous surfaces. In order to rule out possible residual risks (e.g. discolouration), test markings are recommended where necessary. If the result is negative, the new surface should be left under traffic for 4 - 6 weeks before the thermoplastic is laid.

Temporary road markings made from 1-C colours are not recommended since these colour markings represent a separating layer with regards to thermoplastics and reduce adhesion. New bituminous surfaces are usually highly structured and only the colour markings at the tips of the structure are subject to wear, while within the structure the colour is preserved and acts as a separating layer.

If temporary road markings (late autumn with permanently damp surfaces) are necessary, LIMBOROUTE 2-C K809 is recommended for temporary road markings. Practical tests of thermoplastic markings on LIMBOROUTE 2-C K809 have shown that sufficient adhesion of both marking substances can only be guaranteed on a freshly applied and ventilated marking made from LIMBOROUTE 2-C K809 as an additional base coat.
The application of the final thermoplastic marking (e.g. in spring) thus consists of 2 work steps:

1. approx. 0.3 mm LIMBOROUTE 2-C K809 as additional base coat
2. final thermoplastic marking

Both work steps are carried out in direct succession, while observing the airing time of the LIMBOROUTE 2-C K809.

In the event of temporary road markings made of 1-C HS colours or of LIMBOROUTE 2-C K809 without the aforementioned additional base coat, it must be ensured that the temporary road marking is so worn down that the thermoplastic can thermally bond directly with the bituminous subsurface. Otherwise the temporary road markings must otherwise be demarcated using suitable technical means.

Alternatively, it must be ensured that the subsurface is sufficiently dried and pre-heated with the suitable equipment before the thermoplastic is applied. Adhesion samples must be carried out.

Older, emaciated bituminous surfaces should be pre-treated with **primer for thermoplastic** to improve adhesion if necessary.

## 4.4 Paved surfaces

Thermoplastics are not suitable for application on paved surfaces (cracking and adhesion problems).

## 4.5 Synthetic resin floors

Thermoplastics are not suitable for application on synthetic resin floors. Here, suitable products must be selected under the heading “Hall markings".

# 5 Application techniques

Can be processed by machine using standard thermoplastic laying machines (screed box or extruder technology), or manually.
For coarse structured surfaces, despite a precisely set layer thickness at the screed box, additional material consumption can occur when applying by hand or machine using the screed box technique, because the cavities of the surface structure are first filled before the measurable layer thickness forms in accordance with the settings.

When manually laying the markings and masking them, the rapid hardening (cooling off) of the thermoplastic must be taken into account. It is essential that the markings are dropped on with drop-on material and the adhesive strips are removed (peeled off) in a timely manner. Otherwise, the drop-on material will be insufficiently embedded or the edges of the marking will come off the surface when the adhesive strips are peeled off. In both cases, significant effects on the traffic-related properties and the durability of the marking are to be expected.

Note on manual work with templates:
Do not put material adhering to the stencil that has been mixed with release agent back into the cooker.

# 6 Warranties / test certificates

## 6.1 Warranties

The traffic-related properties identified in the BASt test certificates result from testing the wear resistance of a marking system under the conditions of the turntable road-marking test system (RPA) at the Federal Highway Research Institute (BASt), tried and tested sections. The test certificate confirms that a tested marking system meets the minimum requirements for wear resistance (wheel roll-over cycles) specified in the valid ZTV M. It does not represent a warranty of these properties within the specified warranty periods in practice.
A warranty for the traffic-related properties in practice shall be granted within the scope of the currently valid ZTV M and only applies under typical traffic loads caused by free rolling traffic and using the systems recommended and tested by SWARCO Road Marking Systems in compliance with the respective technical information.

**Limitation periods for claims for defects (warranty) are ruled out in the following cases:**

- exceptionally high wear of the marking on roads with extremely high traffic loads (average daily traffic) caused by rolling traffic, e.g. in conurbations
- exceptional mechanical loads due to: winter road maintenance, tracked vehicles, agricultural traffic and other heavy military equipment, increased radial forces e.g. in curves
- increased load due to changes in traffic routing, e.g. at construction sites
- insufficient structural condition of a road
- insufficient cleaning of the surface caused by environmental influences (see "General information on the technical information")
- when processing the marking instances in deviation from the specifications of the technical information
- outside the warranty period in accordance with the valid ZTV M
- failure to comply with other specifications of the valid ZTV M (e.g. selection of marking systems, etc.)

**Warranties in the system with temporary road markings in accordance with valid ZTV M shall only be assumed if:**

- you only use materials from SWARCO Road Marking Systems that have been tested as a marking system as temporary road markings and final markings (see section 4.3)
- the temporary road marking is functional at the time of application with the final marking and adhesion samples that were carried out did not result in any restrictions (adhesion samples of the temporary road marking are mandatory)

## 6.2 Table 1: Turntable road-marking test system (RPA) - test certificates of BASt

| Test certificate no. | Layer thickness | Consumption** | | Drop-on material | Traffic-related properties | |
|---|---|---|---|---|---|---|
| | mm | Material | Drop-on material | Designation (deviating designation possible - see test certificate) | New condition | Used condition |
| | | kg/m² | kg/m² | | | |
| **Type I marking** | | | | | | |
| **2003 1DH 01.04** | 3.0 | 6.0 | 0.35 | SWARCOLUX P21 T14 M25 | P7, S4, R4, Q5, T2* | P7, S1, R3, Q5 |

* The specified drying time is a laboratory value and may differ depending on climatic conditions.
**The actual material consumption depends on the application technique, the machine settings and the resulting, actually applied layer thickness, as well as applied drop-on material.

Since 2000, the master sample test for sample uniformity has been carried out at BASt and is usually recorded in the test certificate in section 3.

The basis for the classification of the marking systems into the traffic-related properties in new and used condition was the table "Calculated measurement values" in the appendix "Results for the BASt test number ..." of the respective BASt test certificate:

- **for all colour and reactive systems**
  New condition: measured values at 0.01 million wheel roll-over cycles or (no measurement data)
  measured values at 0.1 million wheel roll-over cycles
  plus the trafficability class
  Used condition: lowest values achieved > 0.01 or 0.1 million wheel roll-over cycles
- **for thermoplastic systems** (night visibility R= measured value according to table + 30 mcd / m² -lx)
  New condition: measured values at 0 wheel roll-over cycles
  plus the trafficability class
  Used condition: lowest values achieved > 0 wheel roll-over cycles