PROCESSING INSTRUCTIONS
Biresin® Composites Resins

06/2012 / VERSION 1 / SIKAAXSON / COMPOSITES INSTRUCTIONS

CLASSIFICATION

BUILDING TRUST

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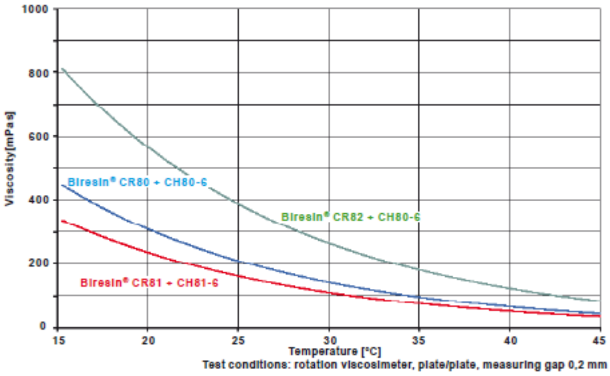
1 STORAGE AND MATERIAL PREPARATION

- The storage temperatures should be between 18 and 25°C.
- Depending on the conditions (temperature and time) the Biresin® CR resin components may crystallise, i.e. solidify. As a result some resin crystals can form inside the container on the bottom and the sides, or the resin components can become completely solidified.
- When the temperature is increased, the crystals become liquid again. Briefly re-heating the Biresin® CR resin components, even repeatedly, does not bring about any reduction in quality. We therefore recommend that the crystallised resin components be liquefied again at a temperature of approx. 50 to 60°C (material temperature). Depending on the size of the container, this can take between 2 h and 12 h.
- Biresin® CH hardeners can also crystallise at lower temperatures (below around 10°C). Increasing the temperature to 18°C or a little higher causes the hardener to liquefy again. Brief re-heating of the Biresin® CH hardeners does not lead to any loss of quality either.
- The cover of the container or the tension ring in the case of buckets should be loosened during heating in order to prevent the build-up of excess pressure.
- If the Biresin® Composite components have to be stored in unheated rooms, we recommend that, in the winter months, resin and hardener be moved to where they are to be processed one or two days before use so that the resin and hardener can become adapted to the temperature.
- Resin and hardener should be checked for crystallisation before use.
- The hardeners can also react with carbon dioxide in the air. This can be observed in the case of hardener containers which have been repeatedly opened and closed (white crystals, usually forming on the edge of the container) or as a thin skin on the surface of mixed resin systems. These reaction products consist of carbonate.
- This side reaction is irreversible and this crystalline material of the hardener cannot be liquefied again by heating. The remaining hardener in liquid form, however, can be used after removing the crystals and there is no loss of quality.

2 PROCESSING INSTRUCTIONS

- The properties of the hardened epoxy resins depend on the mixing ratio, which must therefore be complied with as specified.
- Viscosity is one of the main determining factors when using epoxy resins.
- Low-viscosity epoxy resin systems are associated with good fibre wetting and well suited to the infusion process providing short infusion times.
- This contrasts with systems for the wet lay-up procedure where draining from fabrics that are impregnated on inclined surfaces is an issue. Low-viscosity resins used in this situation tend to flow from these areas reducing the resin content but producing a surplus lower down. Draining slows down and stops only when the viscosity increases as the hardening process progresses.
- Resin systems with increased viscosity (wet lay-up systems) can also be processed in the infusion process if the permeability of the fibre material is high i.e. has low resistance to flow.
- The following diagram shows the viscosity of three different systems in relation to temperature. It demonstrates that higher temperatures lead to reduced mixed viscosity.



- The Biresin CR82 and CR84 systems possess optimum processing properties for the wet lay-up process, where they are processed in a somewhat higher viscosity range of from 350 to 550 mPas.
- In this context, it must be borne in mind that higher temperatures can also make the systems more reactive and therefore reduce their pot life (+10°C results in an approximately 50 % reduction of pot life). It also means that higher temperature quickly to lower viscosity.

3 CURING OF THE EPOXY RESINS

- After the resin systems have been processed, hardening of the components takes place. The reaction of the epoxy resins with a hardener requires a certain level of activation energy, i.e. if the temperature is too low, the resin components do not react with the hardener. This temperature varies depending on the system being used. In general, however, it can be said that a temperature over 10°C is necessary for a reaction to take place.
- The glass transition temperature (TG) of a hardened EP system is around 15°C to 25°C above the hardening temperature. For room temperature hardening (irrespective of the system), a maximum TG of approx. 50°C can therefore be expected. If the user wants to achieve a glass transition temperature of 80°C with our Biresin CR80 + CH80-2, we recommend that hardening be carried out at 60°C to 70°C.
- The maximum achievable TG is indicated in the PDS. It depends on the system and can be achieved under the hardening conditions indicated.
- The hardening of epoxy resins involves an exothermic reaction. This is why temperatures in the part which are considerably above the hardening temperature are possible, depending on the thickness of the part and the resin content. This must be taken into account when the hardening conditions are chosen (temperature and time).
- With regard to all hardening processes, it must be ensured that the specified temperatures apply to the entire part, i.e. a correspondingly longer time is needed to ensure complete warming of thick parts.

4 POSTCURING OF COMPONENTS

- In cases where the mould cannot withstand temperatures of around 20°C lower than the TG being aimed for in the item being produced, we recommend that the part be hardened in the mould at the temperature the mould is capable of and then tempered, separately from the mould, with or without a holding device, in an oven.
- For curing without a holding device we recommend to put the components into the oven at the same temperature it was cured at in the mould, then postcured with a heating rate of 10-20°C / h to a temperature of maximum 15°C below the maximum achievable TG. If the starting temperature is too high it is possible that the part will buckle in the oven under its own weight.

5 VALUE BASES

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

6 LEGAL NOTICE

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