T-E-Klebetechnik

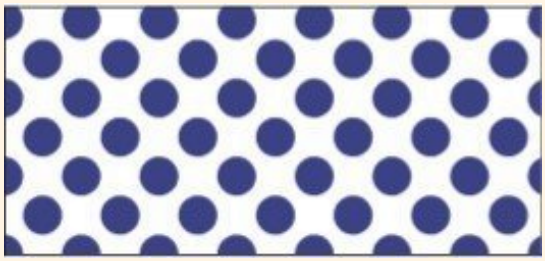
Anwendungs-, Verfahrens- und Dosiertechnik

High temperature processing instructions

When using high temperature adhesives to bond large areas of metal or other non-porous or absorbent materials, drying or curing the adhesives can be a challenge. The binders contained in the adhesives contain both chemically and physically bound water, which in these cases can only escape through the glue joint or adhesive gap.

Gravimetric investigations have shown that measurable residual amounts of water are still present even at temperatures of 200°C. If the bonded parts are heated too early to temperatures above 90°C, the water evaporates. Since the volume of evaporating water is about 1,700 times greater than that of liquid water, if it is heated too quickly or if the water content is high, the water vapor cannot escape quickly enough, which usually leads to the bonded components being pressed apart or to the adhesive being forced out of the adhesive joint. In addition, the foaming water leads to a porous structure of the adhesive and impairs its strength.

To avoid or reduce such problems, there are various practices.

1	Apply the adhesive in dots to better dissipate the water vapor. When doing so, make sure that the distance between the adhesive dots and the quantity applied are selected so that there is sufficient free area after the adhesive surfaces have been pressed on.	
2	Apply the adhesive in strips with a notched trowel, however, make sure that there are sufficient free areas.	

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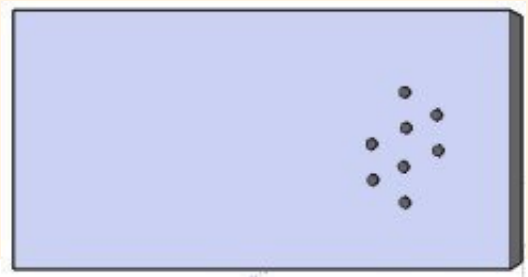
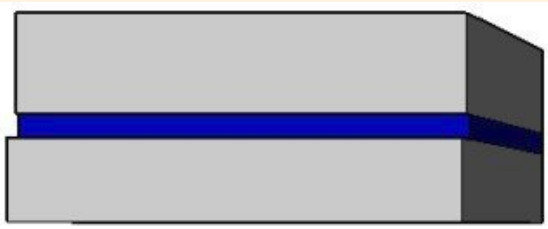
Vahrenwalder Str. 131	Eckenerstr. 9	UST-ID-No.: DE 358948140	Internet:	0000 0101 0403 27	0030 0244 1893 00
D-30165 Hannover	D-30179 Hannover	EORI-No.: DE 5193265	www.t-e-klebetechnik.de	BIC: NOLADE2HXXX	BIC: PBNKDEFF

3	Where possible, install ventilation holes.	
4	Select a larger bonding gap to increase the ratio of bonding gap to bonding area.	
5	Heat can be used to accelerate the curing or setting process. However, make sure that the temperature is not raised above 70-80°C initially to avoid the formation of vapor bubbles. Only increase the temperature slowly thereafter, as moisture can only diffuse very slowly from the inner point to the outside.	

Due to the size of the surfaces to be bonded, the adhesives selected and the layer thicknesses applied, only general information can be given here. It is therefore advisable to carry out an appropriate trial bond in order to develop a feeling for the suitable adhesive quantity and distribution.

In general, it is recommended to heat the components to be bonded evenly to avoid possible stresses. The surfaces should be free of grease and clean before bonding, loose adhesions must be removed. Rough surfaces generally improve adhesion.

The adhesion of high-temperature adhesives for bonding metals is lower than that of epoxy resin adhesives at temperatures up to 150°C. Before using HT adhesives, it should therefore be checked whether the strength values are sufficient for the desired application.

It should also be noted that high-temperature adhesives are ceramic adhesives which become relatively hard and brittle after curing. This can lead to cracks and thus to failure of the bonded joint under strong impact loads or continuous vibrations. This can be improved in individual cases by adding fibers or "soft" components, but the addition of soft components can in turn reduce the strength.

The addition of hardeners accelerates the curing of HT adhesives and allows earlier handling of the bonded components. It should be noted, however, that the addition of hardeners does not result in faster removal of the water they contain. Therefore, the problem of vapor bubble formation remains if the components are heated prematurely or too quickly.

The high-temperature processing instructions given here are of a general nature. A legally binding assurance of certain properties or the suitability for a possible pretreatment of your individual materials cannot be derived from this information. The information given here is based on our current experience and knowledge. They do not constitute instructions for action.