Duratek®
EPOXY AND POLYURETHANE SYSTEMS

KLB 416

POLYURETHANE BASED ADHESIVE

- Mainly designed for the production of the sandwich panels;
- Solvent free system;
- Elastic;
- Does not break or separate from the adhered surface;
- High impact strength;
- Good temperature resistance;
- Suitable for both manual and automatic applications;
- Room temperature curing system.

DESCRIPTION

KLB 416 is a solvent free polyurethane based adhesive with two components.

KLB 416 is used to adhere polystyrene, polyurethane or PVC foam blocks on sheet iron, aluminum, galvanized metal, wood or GRP surfaces, after the necessary surface treatments and priming are conducted. **KLB 416** is suitable for the production of iceliners' sandvich panels and to adhere the sandwich panels together.

PHYSICAL PROPERTIES

	Unit	Polyol + Isocyanate
Density	kg / lt	1,48 ± 0,10
Viscosity	mPas	2.100 ± 300
Pot Life (@23°C, 100 ml)	Minutes	20 ± 5
Open Time (@23°C, %55 RH)	Minutes	50 ± 15
Press Time (@23°C, %55 RH)	Hours	9 ± 2
Curing Time (@23°C, %55 RH)	Hours	24
Comp. Curing (@23°C, %55 RH)	Week	1

MIXING

Components must be mixed with each other at the given mixing ratios. Correct tools of measurement must be used for mixing; intuitive estimates must be avoided. If one of the components is measured less, system will never cure correctly and maximum mechanical and chemical strengths will never be reached.

MIXING RATIO

	POLYOL	ISOCYANATE
By Weight	80	20
By Volume	76	24

Measured components must be mixed together using an electrical mixer at low rpm (400 – 500 rev/min). If mixed too fast, air bubbles will be introduced into the mixture. Mixing must continue, till a homogenous mixture is obtained (appr. for 2 – 4 minutes). Material at the hard to reach places of the container (at the sides and bottom of it) must be mixed well. Mixer must be moved vertically and horizontally.

Pot life will be shorter, if mixed in large quantities and / or at high temperatures. Pot life can be extended and / or air bubbles can be removed more easily, if material mixed in a deep container is transferred into a broad and shallow container.

Properly adjusted mixing pumps result in the best and most reliable mixing.

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APPLICATION

Properly mixed system as described in the previous section is ready to use. Ambient temperature has to be between 15 – 25°C, relative humidity mustn't exceed 65%. If material is stored in cold storages at poor conditions, or if the material is used at poor conditions or on cold surfaces, curing time of the system will be longer, application quality of the system may decrease dramatically due to the increased viscosity, surface may stay tacky. It must also be taken into consideration, that material will cure faster at higher temperatures.

It is crucial, that **KLB 416**, ambient temperature and application surface all have the same or approximately the same temperature.

Polyurethanes are very sensitive to humidity. Please make sure that the application surfaces are dry and the relative humidity does not exceed 65% during the whole application till curing.

Application surface has to be dry and free of oil, dust and other contaminants.

Mixed materials must be consumed, before the pot life is reached. Temperature development within the container must be followed and recorded.

Under normal circumstances, the polyurethane consumption is 0,250 – 0,400 kg / m^2. This ratio may be different for different types of application or it may change at different temperatures. This amount must be consumed within the pot life and the open time of the product.

In most cases, it is enough to apply the material only on one side. However, in some cases (i.e., when both surfaces are rough and / or highly absorbent), better results may be obtained, if **KLB 416** is applied on both surfaces.

Parts can be assembled after the application. Do not separate the assembled parts. If the separation of the assembled parts is necessary, clean the surfaces to remove the existing adhesive and apply new adhesive.

Assembled parts must be put under pressure immediately. Parts have to be kept under pressure for 8 – 10 hours. The necessary pressure is 0,15 – 0,95 N/mm^2, depending on the part being produced.

Elevated temperature may be used to accelerate the curing process. However, adhesive should not be cured too fast. Gradual increase of the temperature is recommended. Elevated temperature should not destroy the adhered substrate materials. Materials' temperature resistance must be checked before heating.

Temperature's homogenous distribution on the assembled part during curing is essential to prevent local property differences and to ensure equal curing throughout the part.

Temperature must be kept stable during curing. Temperature decrease during curing will increase the actual curing period. If not noticed, adhesion strength will be less than estimated. To spot temperature changes, environment can be followed with thermo couples.

MECHANICAL PROPERTIES OF THE CURED ADHESIVE

Property	Unit	Standard	CURING: 48 Hours @ 23°C + 9 Hours @ 60°C
Tensile Strength	N / mm^2	ISO 527 – 2	20 – 25
Lap Shear Strength	N / mm^2	EN ISO 4587	12 – 17

THINNER

DO NOT ADD ANY THINNER!

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SAFETY MEASURES

- In case of contact of the mixed or unmixed components of the material on eyes, wash with plenty of water and seek immediate medical help.
- Avoid skin contact. Do not wash the material contaminants on the skin with solvent. Solvent thins the material. Thinned material can penetrate into the skin easier. Hot water, soft soap and wood dust combination is the best cleaner.
- If clothes are contaminated with the material, they must be changed and washed. Material might contact the skin through the cloth.
- Never get the material into contact with food. Do not eat or swallow contaminated food. In such a case, seek medical assistance.
- Use protective cream or glows, clothes and goggles. Caution: Operators cannot feel the contamination, if they are wearing glows. When they touch machine knobs, door handles and similar common use parts with contaminated glows, other operators without glows may get into contact with the material. In such a case, follow the procedures described before.
- Working area has to be ventilated.
- Keep the material away from children.

EQUIPMENT CLEANING

PR 20 is recommended for cleaning tools. Tools are soaked in **PR 20** and then rinsed under running water.

PACKAGING

A and B components are provided in separate packages in can, drum or IBC form.

STORAGE AND SHELF LIFE

System must be kept in its original, unopened package in closed and dry warehouse conditions between 15 – 25 °C. Avoid direct sun light exposure. Shelf life under these conditions is 8 months.

Used but unfinished containers have to be kept in closed and dry warehouse conditions between 15 – 25 °C as well. They must be consumed as soon as possible. Both components (especially isocyanate should not come into contact with air.

Material's physical and application properties will change, if stored at inappropriate conditions. Please make sure (by heating or cooling down), that the product has the given conditions before using. Please note, that bigger packages need more time for conditioning.

ATTENTION

- Temperature of the application area must be 15°C – 25°C.
- During application, mixed product must be consumed within the pot life.
- If mixed in large quantities, or if any one of the temperature criteria is too high, pot life will be shorter than expected.

The facts on this Technical Data Sheet are based on laboratory test results. This data sheet is valid until subsequent issue. Duratek A.S. reserves the right to change the given data without notice.
Please consult our technical department for further information.

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