Wolf

Instructions for the bonding
of bearing elements
made of

ZEDEX 100

Fastening of bearing elements made from ZEDEX 100K

The bearing elements made from ZEDEX 100K should, if possible, be fastened by bonding. Bearing elements showing a material thickness of more than 4 mm should additionally be locked with brass screws.
For the bonding of bearing elements made from ZEDEX 100 we recommend two different methods depending on the ambient temperature:

A. For ambient temperatures from +10°C up to +60°C

For ambient temperatures between +10°C and + 60°C we recommend the two component-adhesive:
Araldit AW 116 by CIBA-GEIGY in connection with the hardener HV 953 U.
We specially offer this adhesive and hardener in small containers to our customers.
This bonding technology requires a pre-treatment of the plastic coating!
The instruction for this bonding technique begins at chapter 2.

B. For ambient temperatures from - 30°C up to + 80°C

For ambient temperatures between -30°C and +80°C we recommend the one-component-adhesive:
Wolf Klebstoff 100 A pre-treatment of both adherend surfaces with the activator Wolf Primer 100 enables an increase in strength. This is particularly recommendable when bonding with aluminium.
his bonding technology does not require a pre-treatment of the plastic coating; the plastic surface should be as smooth as possible! This must be taken into account when placing the order.
The instruction for this bonding technique begins at chapter 3.

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2. Instructions for the bonding technology for ambient temperatures from +10°C up to 60°C

2.1. Pre-treatment of the adherend surfaces

2.1.1. ZEDEX 100K surface

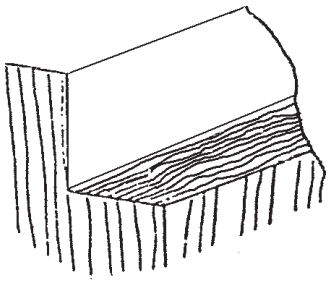
Before bonding the surfaces of the parts to be connected always need to be cleaned propperly. (instructions see below)

In case of contamination during processing the adherend surfaces need to be cleaned as follows:

- The adherend surfaces must be wiped off with a clean cloth which has been impregnated with a grease solvent (acetone, trichloroethylene, methylene chloride, never with alcohol, benzine or paint diluent), until a white cloth does not show any signs of contamination.
- Please avoid a new contamination after cleaning by dirty fingers.

2.1.2. Metal surface

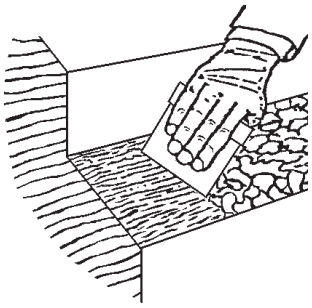
- The metal surface must be roughened with sandpaper of a grit from K80 to K150, which means 80 to 150 abrasive particles per square centimeter.
- Afterwards cleaning the adherend surface from grease and oil.



2.2. Application of adhesive

2.2.1.Metal surface

- The adhesive must be applied approx. 0.2 mm thick to the metal surface by a spatula.



2.2.2. ZEDEX 100K surface

- The adhesive must be applied approx. 0.2 mm thick to the bearing made from ZX-100 by a spatula. The adhesive must fill-out hollows, grooves and pores or chambers.
- The adhesive must show a closed surface after application. Air entrapments must be avoided, for they could considerably reduce the adhesive strength.

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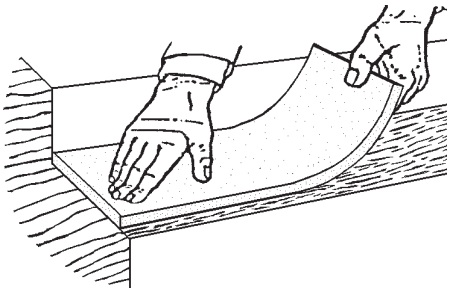
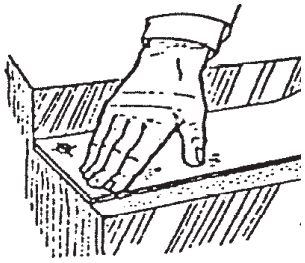
2.3. Joining parts

• Starting from one side through bending the ZX-100K coating, we lay one adherend surface on top of the other.



• We put the ZX-100K bearing into the accurate position by shoving.

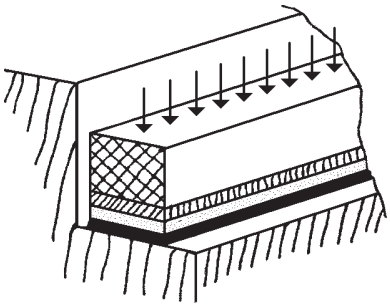


2.4. Curing the bonded joints

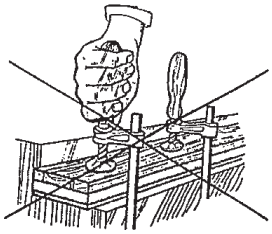
After joining the parts, the adhesive must cure under stress.
The following measures are necessary therefore:

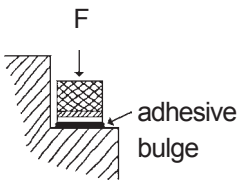
- For the adjustment of thickness tolerances we recommend to lay a rubber band, approximately 2 to 4 mm thick and of a shore hardness of approximately 60° to 80° on the bearing. This rubber band ensures an even dispersion of the load.

- In order to ensure the necessary contact pressure you should attach a load, creating a specific surface pressure of 0.05 N/mm². When loading correctly, an even adhesive bulge develops.



Attention!
Do not use clamping strips with screw clamps.





2.5. Sealing the bonding

Necessary in cases of extreme wear by coolants, mineral oils, water etc.

- Sealing gluelines with a permanently flexible sealant on a silicone-rubber-basis with as little share of water as possible.

- The bonding process is finished with the sealing of the bonded joints.

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2.6. Adhesive characteristics

aspect	Adhesive AW 116	Hardener HV 953U
color	light beige, slightly thixotropic paste	highly viscose, light yellow liquid
viskosity, Brookfield (25°C)	30000 - 45000 mPa s	25000 - 40000 mPa s
shear strength (DIN 53283) curing: 80min/80°C	>18N/mm²	>18N/mm²

	Araldit AW 116	Hardener HV 953 U
product characteristics	modified epoxide resin based upon bisphenol	with tertiary amine modified polyaminoamide
flash point [° C.] (Pensky-Martens)	126	110
density [g/cm3]	1.10	0.95
shelf life	2 Jahre	2 years
characteristic smell	low	yes
dangerous decomposition products	carbon monoxide and carbon dioxide in case of fire	carbon monoxide, carbon dioxide and other toxic gas and fumes in case of fire
waste disposal	normal disposal methods according to local regulations	normal disposal methods according to local regulations

2.7.Storage

The components described in these instructions should be stored at temperatures of 18 – 25°C, always well closed and dry and if possible in the original containers.
On these conditions the shelf life corresponds to the times given in the end product specification.

2.8. Processing

2.8.1. Mixing ratio

	weight contents	volume contents
Araldit AW 116	100	100
Hardener HV 953 U	50	60

Both components must be mixed carefully and so long until the hardener is equally dispersed into the resin.

2.8.2. Mixing viscosity

Initial mixing viscosity at 25°C 25000-30000 mPa s

2.8.3. Pot life

The pot life for a quantity of 100 g adhesive is at least 90 minutes at 23°C.

2.8.4.Curing conditions

curing temperature [°C]	10	23	40	60	80	100	120
curing time [h]:	48	24	5	1	-	-	-
curing time [min]	-	-	-	-	30	15	10
shear strength [N/mm²]	5	9	24	27	28	30	30

2.8.5.Mechanical processing

For the processing of huge adhesive quantities some companies have developped special metering, mixing and spreading units.

2.8.6. Cleaning the tools

For cleaning the tools we recommend warm soft soap water, actually before the adhesive becomes cured.
The removal of resin residues, which are already hard is laborious and time-consuming.
When using a solvent, as for example acetone, the usual safety precautions must be taken into account.
Please avoid a contamination of hands.

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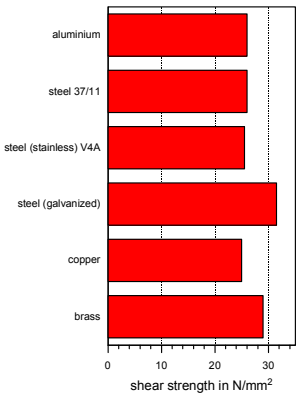
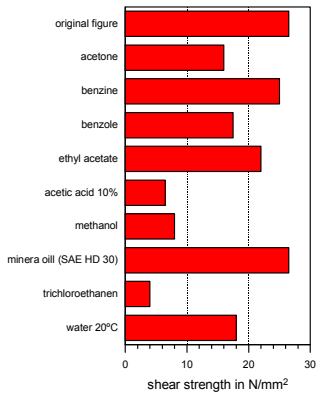
2.8.7. End properties

For the determination of the end properties we use standard test pieces made from aluminium (anticordal 100 B) with the measures 170 x 25 x 1.5 mm, length of overlap: 12.5 mm, if not noted differently.
The following figures have been determined after standard test procedures on typical production batches and serve exclusively the technical information. They do not represent a product specification.

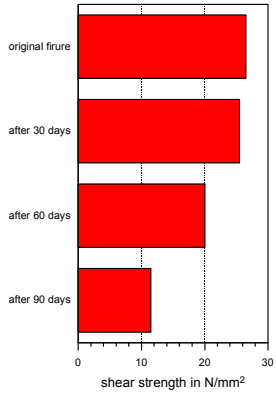
Shear strength of different metal bondings according to DIN 53283



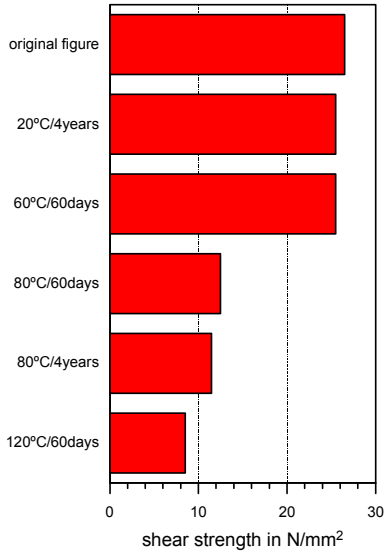
Shear strength after storage in different chemicals according to DIN 53283



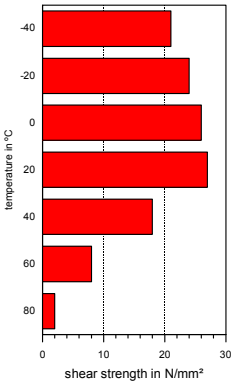
Shear strength after storage in tropical conditions (40/92) according to DIN 50015



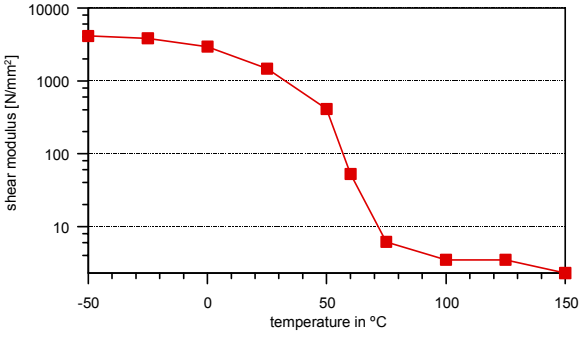
Shear strength after heat aging



Shear strength depending on temperature according to DIN 53283



Shear modulus depending on temperature according to DIN 53445



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2.8.8. Factory hygiene
please follow the valid regulations relating to factory hygiene when dealing with reactive resins.

2.8.9. Factory hygiene measures
protective clothing:
gloves, cuffs and safety glasses are obligatory.

2.8.10. Skin barrier
before starting work as well as after every skin cleaning you should rub your skin with a barrier cream or skin food.

2.8.11. Treatment of soiled skin sections
dabbing the skin with absorbent paper; washing with warm water and alkali-free soap.
Do not use solvents.

2.8.12. Measures to keep the work place clean
light colored paper pad, disposable container

2.8.13. Removal of submerged material
wiping up with saw dust, waste cotton or cloth; waste container with plastics liner

2.8.14. Ventilation inside the workroom
3-5 times changing air per hour

2.8.15. Ventilation at the work place
local extractor fan, avoiding the inhalation of fumes

2.8.16. First aid
in case of material spatters which have got into the eyes by mistake, you should immediately wash out your eyes under flowing water for 10 to 15 minutes.
In any case you should contact an eye specialist afterwards.

Dab away material spatters on the skin, wash it and put on cleansing cream. In case of stronger skin irritation or cautery please contact a doctor.
Soiled clothes should be changed immediately.

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3.Instruction for the bonding technology for ambient temperatures from - 30°C up to + 80°C

3.1. Pre-treatment of the adherend surfaces

3.1.1. ZEDEX 100 surface

- The elements to be connected always need to be propperly cleaned. You must not roughen the elements surfaces in order to bond according to the process described below.

In case of contamination during processing the adherend surfaces need to be cleaned once again as follows:

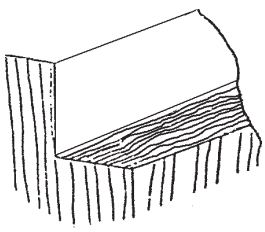
- The adherend surfaces must be wiped off with a clean cloth which has been impregnated with a grease solvent (acetone, trichloroethylene, methylene chloride, never with alcohol, benzine or paint diluent) until a white cloth does not show any signs of contamination.
  Please avoid a new contamination after cleaning by dirty fingers.

- An increase in strength can be achieved by means of a pre-treatment of both adherend surfaces with Wolf Primer 100.
  This is particularly recommendable when bonding with aluminium. Then you have to spread primer on the ZX-100 coating and the metal by means of a natural hair brush, until the surface is entirely covered.

3.1.2.Metal surface

- The metal surface must be roughened with sandpaper of a grit from K80 to K150, which means 80 to 150 abrasive materials per square centimeter.

- Afterwards cleaning the adherend surface from grease and oil and eventually pre-treatment with primer as described under point 3.1.1.

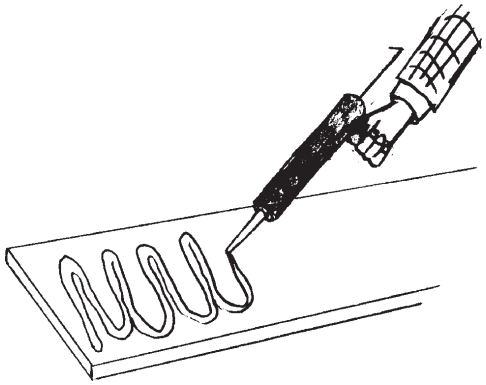


3.2. Application of adhesive

3.2.1. Metal surface

You can start applying the adhesive when the primer or/and the cleaner have completely dried.

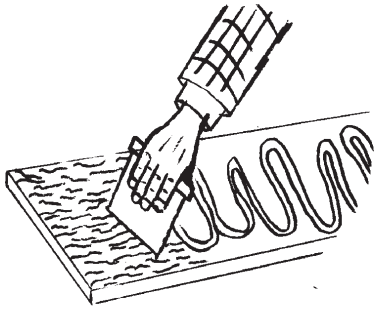
- Then you can apply the adhesive by means of a cartridge syringe to the metal surface in form of beads.



- The adhesive is applied to the metal surface in an equally thick layer of approximately 0.3 mm by means of a spreader comb. The adhesive must fill-out hollows, grooves and pores or chambers.

- The adhesive must show a closed surface after application. The grooves which have been created by the spreader comb must all run in longitudinal direction.

- Air entrapments must be avoided, for they could considerably reduce the adhesive strength.



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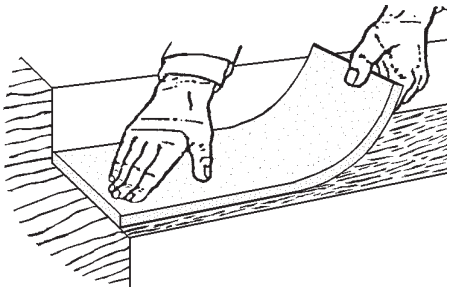
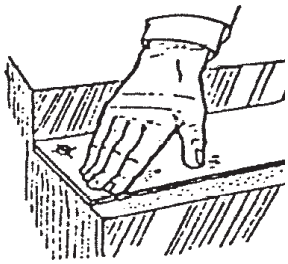
3.2.2. Joining parts

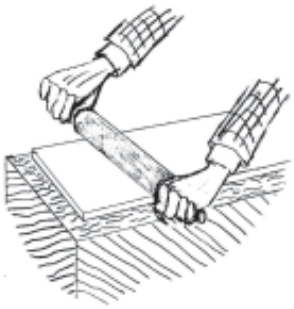
- Starting from one side through bending the ZX -100K coating, we lay one adherend surface on top of the other.



- We put the ZX-100 bonding into the accurate position.



- Then we bear on the ZX-100K coating by means of a pressure roll for the remaining air can escape. Thereby you should see to it, that the “roll direction” corresponds to the direction of the grooves inside the adhesive layer.



3.2.3. Curing the bonded joints

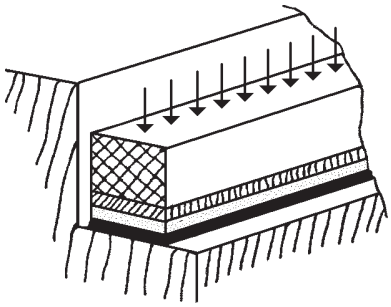
- After joining the parts, the adhesive must cure under stress.

The following measures are necessary therefore:

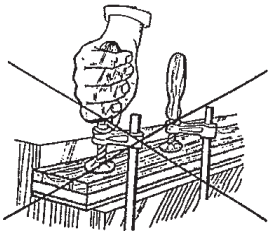
- For the adjustment of thickness tolerances we recommend to lay a rubber band, approximately 2 to 4 mm thick and of a shore hardness A of approximately 60° to 80° on the bearing. This rubber band ensures an even dispersion of the load.

- In order to ensure the necessary contact pressure you should attach a load, creating a specific surface pressure of 0.05 N/mm^2.

- When loading correctly, an even adhesive bulge develops.



Attention!
Do not use clamping strips with screw clamps.



3.2.4. Sealing the bonded joints

A sealing of the glueline is not necessary when using the adhesive Wolf Klebstoff 100.

3.3. Adhesive characteristics

product characteristics	Adhesive Wolf 100	Wolf Primer 100
color, aggregate condition	black, paste-like	colorless, liquid
boiling range [° C]	-10	-88 up to -80
melting range [°C]		+76 up to 80
flash point [°C]	>61	-1
density [g/cm³]	1,2	0,91
viscosity 20°C [m Pas]		10-15
waste code	55903	55370
characterisation according to EC standard	contains Isocyanat compounds	easily flammable, irritant

3.4. Storage

The components described in these instructions should be stored at temperatures of 6 – 22 °C, always well closed and if possible in the original containers. On these conditions the shelf life corresponds to the times given in the end product specification.

3.5. Demand of adhesive and Primer

An area of one square meter requires an adhesive quantity of 0.5 l.
In case of additional priming, you need approximately 0.05 l primer.

3.6. Typical curing behaviour

3.6.1. Time required until complete curing

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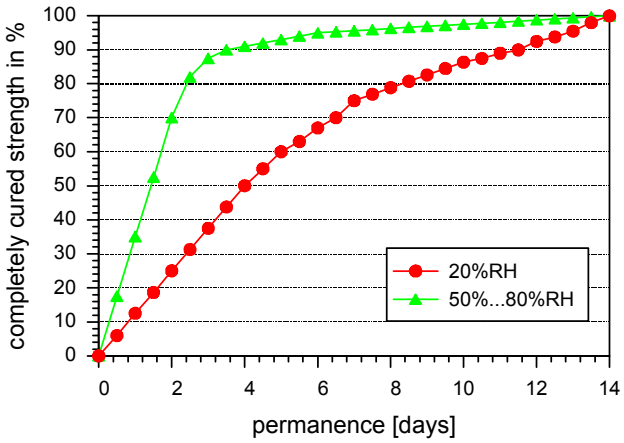
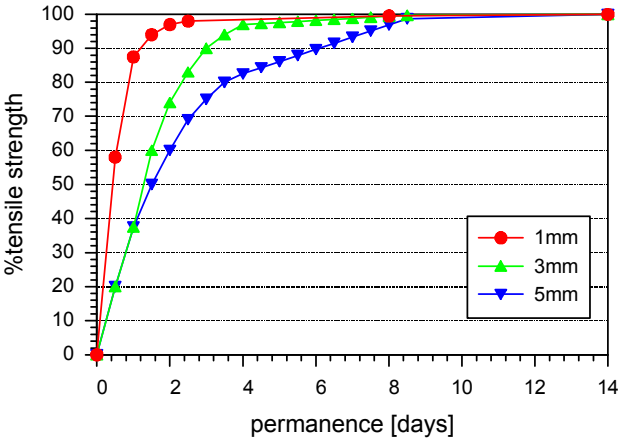
The surface of the adhesive becomes dry enough to touch after a period of exposure of 65 to 75 minutes at an ambient temperature of 20 to 25°C and a humidity of 50 %.

The following diagram shows the degree of curing at different relative humidities. (temperature 22°C, on structural steel, application of the Wolf Primer 100, gap width 3 mm, strength ascertained according to ASTM D1002/DIN 53283)



3.6.2. Curing rate in function of the bonding gap

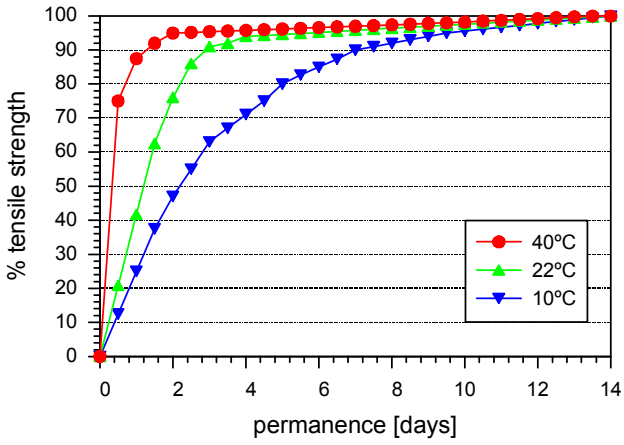
The following diagram shows the degree of curing at different relativehumidities. (temperature 22°C, on structural steel, application of the Wolf Primer 100, strength ascertained according to ASTM D1002/DIN 53283.



3.6.3.Curing time in function of temperature

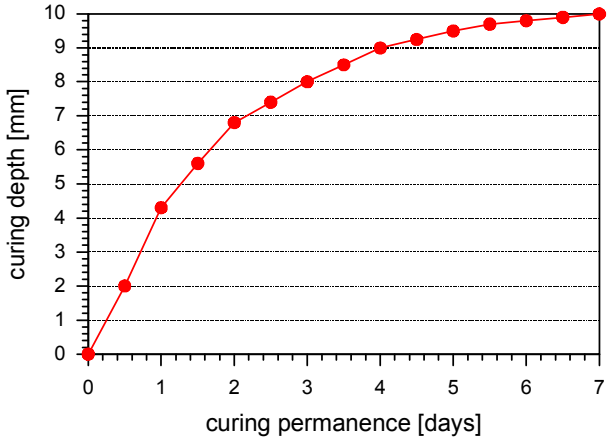
The following diagram shows the degree of curing at different temperatures at 50 %

relative humidity on structural steel, application of the Wolf Primer 100 at a die gap width of 3 mm. The strength has been ascertained according to ASTM D1002/DIN 53283.



3.6.4. Curing depth

The following diagram shows the increase in curing depth in function of time, when curing at 22°C and 50 % relative humidity.



3.7.Typical characteristics of full cured

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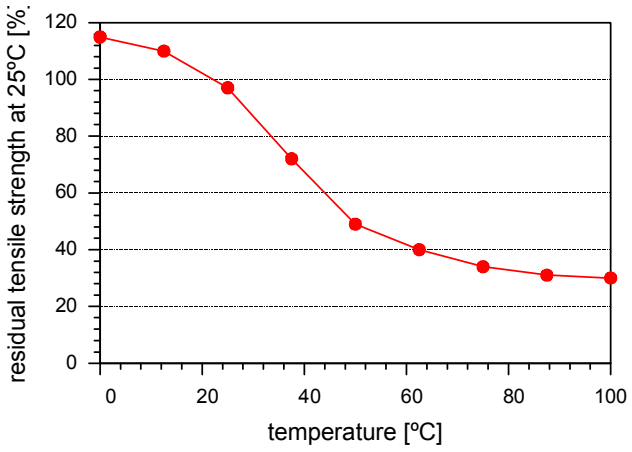
adhesive Wolf 100 (after 14 days; 22°C;50% relative humidity):

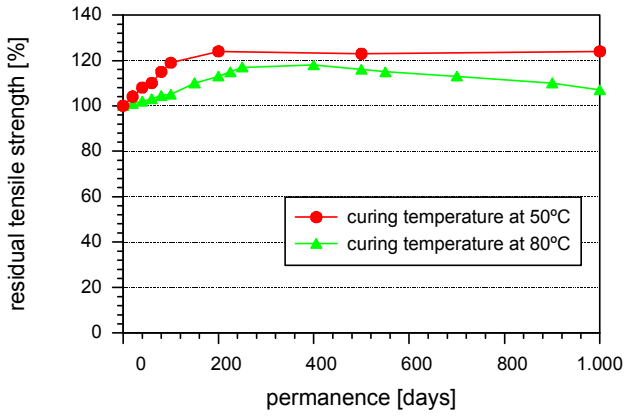
3.7.1. Mechanical properties

Properties	Standard ASTM	Unit	Remarks	Value
shore hardness		A		22 - 30
shore hardness		B	after 1000 h	30 - 40
elongation at break	D638	%		600 - 700
tensile strength	D638	N/mm²		1 - 2.5
modulus in tension	D638	N/mm²		0.4 - 0.8
shear strength	D1002	N/mm²	on structural steel	0.5 - 1.0
shear strength	D1002	N/mm²	on G8Ms	0.7 - 1.5
T-peel strength	D1876	N/mm²	on structural steel	10

3.7.2. Tensile strength at heat in function of temperature



3.7.3. Ageing caused through heat exposure at 22°C



3.8. Chemical resistance

Chemical	Temperature [°C]	Concentration [%]	Content of original strength after 100h [%]	Content of original strength after 500h [%]	Content of original strength after 1000h [%]
water	22		100	55	66
relative humidity	40	95	115	100	95
motor oil	80		130	120	150
sulphuric acid	22	6.5	100	100	90
chloride solution	22	7.5	95	95	95

Test procedure: tensile strength ASTM D638
Curing procedure: 14 days at 22°C, 50 % relative humidity

3.9. General notice

This adhesive is not recommended to use in pure oxygen and/or oxygen-containing systems and should therefore not be used as sealant for chlorine or other highly oxidising materials.

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