

RESOLTECH WWA

Hardener WWB4

Clear epoxy casting system

- Adjustable rigid or flexible casting according to the mixing ratio
- Perfectly transparent
- Excellent air release properties
- Very low viscosity



RESOLTECH WWA / WWB4 is a unique epoxy system formulated for decorative or scientific applications where transparency is fundamental. It is totally clear & colourless, not solvated and compatible with glass. Excellent optical properties and no shrinkage are the key features of this system.

Compatible with most substrates such as glass, wood, cement, stone, ceramic, metal, this system will adapt to most requirements of artists & designers.

Thanks to its **extremely low viscosity**, WWA / WWB4 system can be used in a large number of applications: jewellery, lamps, flower arrangements, protection coatings...

Its manufacturing process and last generation degassing agents enables to obtain **perfectly bubble free castings**.

WWA / WWB4 system enables to adjust the hardness from rigid to flexible. **2:1 mixing ratio in volume** will result in **rigid castings** while increasing the WWB4 ratio (up to **1:1**) will result in **flexible castings**.

Flexible castings are recommended while making inclusions within fragile containers without the risk of crack or breaking while dilatations/contractions that can occur due to temperature changes.

For **small volume castings** a faster system exists: resin **WWA HT**+hardener **WWB4** or **WWB HT**.

RESOLTECH cares about the health and safety of its customers, this is why its formulations such as the WWA / WWB4 system are **free of solvents or CMR components**.

Resin WWA

Hardener WWB4

MIXING RATIO

Rigid version

References	WWA	WWB4
Mixing ratio by weight	100 / 40	
Mixing ratio by volume	2 / 1	

The mixture should be perfectly clear and homogeneous before use.

Flexible version

References	WWA	WWB4
Mixing ratio by weight	100 / 89	
Mixing ratio by volume	1 / 1	

The mixture should be perfectly clear and homogeneous before use.

PHYSICAL CHARACTERISTICS

Visual aspect

WWA :	Colorless limpid liquid
WWB4 :	Colorless limpid liquid
Mixture :	Colorless limpid liquid

Densities at 23°C

References	WWA	WWB4
Density	1.10	0.96
Mix density	Rigid version : 1.06 Flexible version : 1.03	

ISO 1675 (±0.05)

Viscosities at 23°C

References	WWA	WWB4
Viscosity (mPa.s)	600	80
Mix viscosity (mPa.s)	Rigid version : 300 Flexible version : 200	

ISO 12058.2 (±15% tolerance)

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REACTIVITY

Systems	WWA / WWB4 Rigid version	WWA / WWB4 Flexible version
Potlife on 70mL (~4cm thickness) at 23°C	29h	32h
Hard & releasable on 70mL at 23°C	72h	-
Potlife on 1L (~10cm thickness) at 23°C	12h17min	14h45min
Temperature at exothermic peak on 1L at 23°C	70°C	54°C
Time at exothermic peak on 1L at 23°C	11h10min	13h25min

Reactivity measurements by Rheotech®

MECHANICAL CHARACTERISTICS

Systems	WWA / WWB4 Rigid version		WWA / WWB4 Flexible version	
Curing cycles	14d at 23°C	16h at 40°C	14d at 23°C	16h at 40°C
Tensile modulus	1.77 GPa	2.21 GPa	2.7 MPa	2.7 MPa
Tensile max. strength	31.0 MPa	31.1 MPa	1.1 MPa	1.3 MPa
Elongation at tensile max. strength	2.8%	2.3%	74%	85%
Flexural modulus	2.17 GPa	2.15 GPa	-	-
Flexural max. strength	64.0 MPa	68.3 MPa	-	-
Elongation at flexural max. strength	4.6%	4.7%	-	-

Traction according to ISO 527
 Flexion according to ISO 178

Ratio WWA / WWB4 by weight	100 / 40	100 / 50	100 / 60	100 / 70	100 / 80	100 / 90
Shore D Hardness after 14 days at 23°C	85	82	78	67	43	21
Shore D Hardness after 8 hours at 40°C	86	84	83	75	55	35

Hardness according to ISO 868

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APPLICATION

WWA / WWB4 is a casting system. Moulds can be either hard or made of silicon. Moulding can be carried out by gravity or under vacuum. WWA does not trap air easily and does not heat up when used properly.

Temperature should be between 18 to 25°C and humidity level below 70%.

The 2 to 1 mix by volume will provide a hard casting, suitable for the manufacture of fancy shapes, decorative items, ... The soft 1 to 1 mix by volume is suitable for castings in glass containers. The resin will then absorb the dilatation of the glass.

Should a new mix be applied onto cured resin, the contact surface should always be sanded if structural cohesion is required.

Mixing the resin: The mixing phase is the most important one. 99% of product variations are due to poor mixing. It is highly recommended to follow the basic rules as follow:

- Start by pouring the WWB4 hardener in the pre-mix container first
- Add the corresponding amount of WWA resin
- Mix thoroughly but do not include too many air bubbles
- Once the mix is transparent and homogeneous, pour into second mixing container (double potting technique).
- Mix again and ensure perfect optical transparency before casting into mold or glass object

Temperature effects: Epoxy resins are thermosetting plastics, which means that their hardening is linked to temperature: curing/hardening will go faster with temperature increase and will go slower if temperature decreases.

The viscosity will increase while temperature decreases and will decrease at more elevated temperatures.

Mass effect: The higher volume is casted, the more difficult it will be for the resin to evacuate calories, therefore the resin will have a tendency to accelerate its hardening with higher levels of castings.

Contraction: it is commonly admitted that the shrinkage of epoxy resins is negligible, therefore they are used for accurate scale reproductions & mouldings.

Testing: it is highly recommended to do some tests at each change of one of the parameters of the production: type of glass used if casted in glass containers, type of materials if casting inclusions, height of the resin to be casted... before starting industrial productions.

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APPLICATION

Troubleshooting

Problems	Causes	Solutions
The mix remains still uncured after 3 days.	Wrong mixing ratio and / or too low room temperature.	Check the mixing ratio & time and / or increase room temperature.
The mixture cured too fast and gets hot.	High temperature and/or too much mixture was prepared.	Lower the mix quantity.
Air bubbles are entrapped.	Mixing was too fast and air was entrapped.	Favor a soft & slow mixing. A cold resin is much more viscous and air release is more difficult - store products between 20-25°C.
Sticky, greasy surface.	Ambient humidity level is too high.	Check & lower the humidity (<70%) by ventilating. If problem persists, lower the hardener part from 1 to 0.8 for 1 part of resin.
The glass container breaks.	Dilatation coefficient is too important between cured mix & container.	Use the flexible 1:1 mix by volume or close to this ratio.
The casting does not stick to the glass container.	Container was not degreased or curing temperature is too high.	Clean, degrease with acetone, dry containers and avoid curing the mix at temperature above 35-40°C.

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PACKAGING

Kits WWA/ WWB4 rigid version :

- 1.4kg : (1+0.4)kg
- 7kg : (5+2)kg
- 14kg : (10+4)kg
- 35kg : (25+10)kg
- 315kg : (225+3x30)kg
- 1400kg : (1000+2x200)kg

Kits WWA / WWB4 flexible version :

- 1kg : (0.53+0.47)kg
- 4kg : (2.12+1.88)kg
- 10kg : (5.29+4.71)kg
- 20kg : (10.58+9.42)kg
- 60kg : (31.75+28.25)kg
- 425kg : (225+200)kg

TRANSPORT & STORAGE

Keep containers sealed and away from heat and cold preferably between 10°C and 30°C in a well ventilated area. Our products are guaranteed in their original packaging (check expiry date stated on the label).

HEALTH & SAFETY

Skin contact must be avoided by wearing protective nitrile gloves & overalls or other protective clothing. Eye protection should be worn to avoid risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention. Ensure adequate ventilation in work areas. Respiratory protection should be worn with ABEKP coded filters. RESOLTECH issues full Material Safety Data Sheet for all hazardous products. Please ensure that you have the correct MSDS to hand for the materials you are using.

Nota : The data provided in this document is the result of tests and is believed to be accurate. We do not accept any responsibility over the mishandling of these products and our liability is limited strictly to the value of the products we manufacture and supply.

