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**BEETLE CEMENTS are**

Synthetic Cements

Stronger than wood

Inexpensive to use

**BEETLE CEMENTS will**

**STICK**

Stand immersion in water

Last indefinitely

# CEMENTS

## FOR WOOD

BEETLE PRODUCTS COMPANY LTD.



**BEETLE PRODUCTS CO. LTD.**  
DIVISION OF  
**BRITISH INDUSTRIAL PLASTICS LTD.**  
POPES LANE · OLDBURY · WORCESTERSHIRE  
AND  
IDEAL HOUSE · 1 ARGYLL STREET · LONDON · W.1

**BEETLE**

# CEMENTS

A range of Synthetic Cements

for all Wood-working Industries

TECHNICAL LIBRARY  
REF. NO. 24-13





## THE ORIGIN OF BEETLE CEMENTS

In 1936 the I.G. Farbenindustrie Actiengesellschaft proposed that British Industrial Plastics Ltd. should make Kaurit Glue W in England, and sell it under that trade name. The proposal was accepted, full details of their method of manufacture were disclosed and since 1937 all Kaurit Glue W sold in this country has been of purely British origin. But to make a clear distinction between the British and German Kaurit, we have decided that in future it shall be known as **Beetle Cement W** (*see page 16*). But this Cement does not satisfy every need of every trade. British Aeroplane manufacturers, for instance, need a cold setting cement which will fill up interstices. On learning this our chemists immediately started intensive research, which after more than six months' work produced the new cold setting synthetic cement **Beetle Cement A**—a cement which really does meet the aeroplane industry's requirements. It is made in England, from English materials—and to an English formula (*see page 6*).

## THE QUALITIES OF BEETLE CEMENTS

### BEETLE CEMENTS ARE STRONG

If a joint of a Beetle Cement is tested to destruction, it is the wood fibres which break—not the cement.

### BEETLE CEMENTS ARE WATERPROOF

Even after weeks of immersion in water destruction tests still show that the wood fibres break before the cement. Under similar conditions casein glues come apart by themselves.

### BEETLE CEMENTS ARE MOULDPROOF

Joints of a Beetle Cement are unaffected by micro-organisms and are therefore proof against mould-growths and tropical conditions.

### BEETLE CEMENTS SET RAPIDLY

They set quickly and are fully hardened in a very short time, cutting costs by allowing further work to be done on the cemented job without delay. Owing to their high solid content and to the thinness of the coating necessary, the amount of moisture applied to the wood is very small.





IT IS THE WOOD FIBRES WHICH BREAK when a joint of Beetle Cement is tested to destruction. This joint was made with rough machine-planed tongued and grooved boards, where close contact of the surfaces was impossible.

# **BEETLE** **CEMENT A**

**A Cold Setting**

**Synthetic Cement**



## BEETLE CEMENT A—WHAT IT DOES

**Beetle Cement A** is a cold setting synthetic cement made from the condensation of urea and formaldehyde to which are added solid fillers which have been chemically treated.

Beetle Cement A gives durable joints in constructional woodcraft and joinery. It fills the gap where close contact of the two surfaces of the wood cannot be made, and *joints remain strong even where the cement line is as thick as 20 thousandths of an inch.*

Beetle Cement A sets solid in the cold when mixed with a suitable hardener. No pressure is required. It is sufficient that the cement should make good contact with the two wood surfaces, the joint being simply held firmly in position until the cement has hardened.

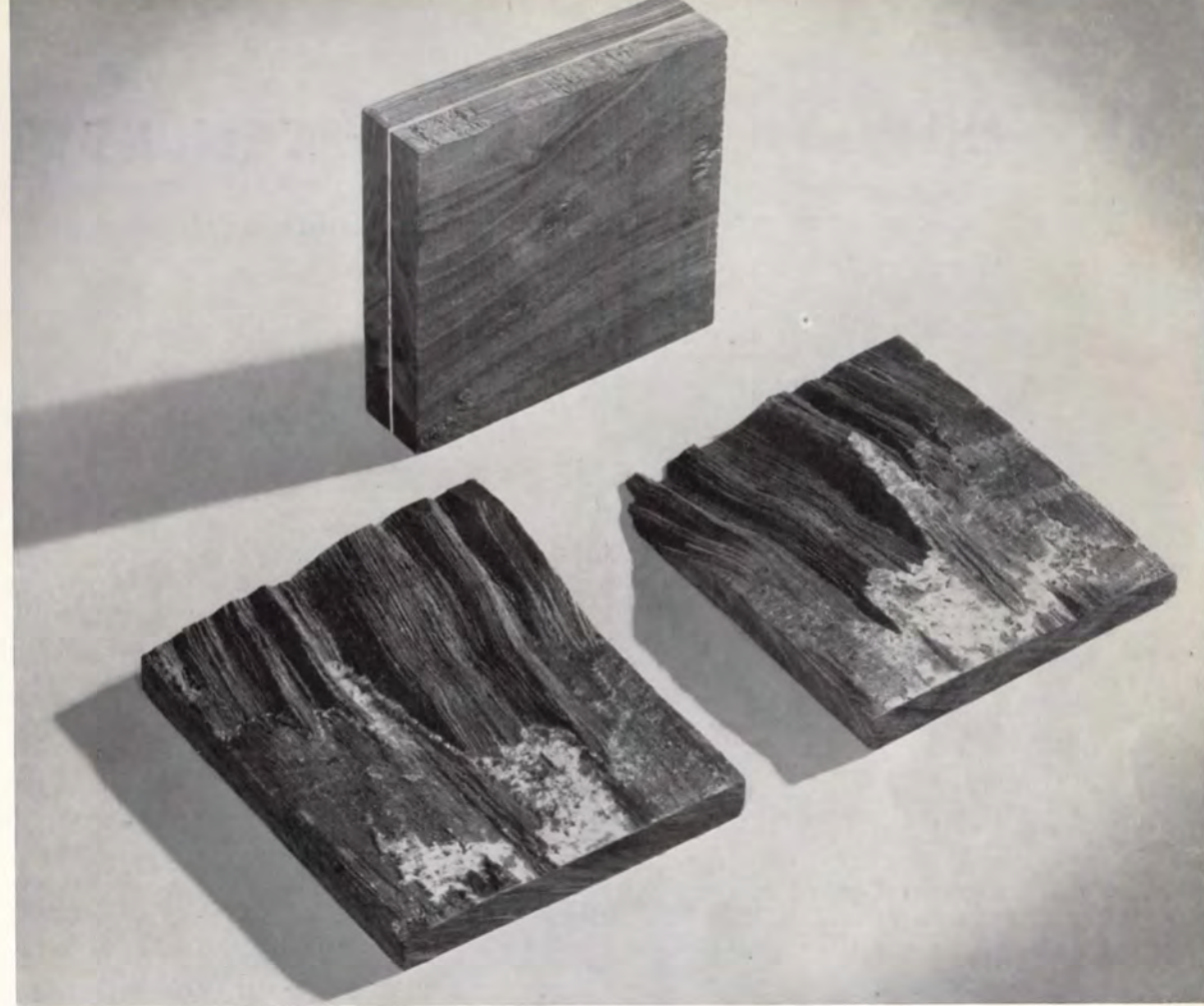
Typical shear tests on specimens with a 20/1000 in. cement layer are as follows :

### DRY TEST *Specimens tested 72 hours after cementing*

	1,320 lbs. per sq. in.	Cement failure with fibres
	1,600 „ „ „ „	„ „ „ „
	1,187 „ „ „ „	Wood failure
Average	<u>1,369</u> „ „ „ „	

### WET TEST *Specimens tested wet after 24 hours' immersion in water*

	1,526 lbs. per sq. in.	Cement failure with fibres
	1,206 „ „ „ „	„ „ „ „
	1,290 „ „ „ „	Wood failure
Average	<u>1,341</u> „ „ „ „	



BEETLE CEMENT A FILLS THE GAP *and even a thick layer of cement is stronger than the wood. Note how the fibres of walnut have torn, although the fracture was forced by wedging into the cement line.*



# HOW TO USE BEETLE CEMENT A

The cement is never used alone but always in conjunction with a 'hardener.' Two types are available :

HARDENER 15 (*purple*) for rapid working.

HARDENER 50 (*brown*) for slow working.

## WITH HARDENER 15 (Purple)

This is used where spreading and assembling can be carried out *quickly*. A mixture is made using 1-oz. hardener per 1-lb. cement, stirred until uniform, and this remains usable for about :

$\frac{1}{2}$ -hour at 80°F	2 hours at 50°F
1 „ „ 70°F	4 „ „ 40°F
1 $\frac{1}{2}$ „ „ 60°F	

*Method A*—Where only light pressure is available both surfaces should be spread with the mixture. The cement is allowed to air-dry for 5-10 minutes and joints must then be assembled and pressure applied *within 10 minutes*. Sufficient to fill all gaps or cavities in the wood should be used.

*Method B*—Where close even contact of the surfaces can be obtained (by machining or pressure, or both) the mixture may be spread thinly on one surface only.

*Method C*—Where a thin cement line can be obtained *with certainty* the Hardener 15 may be applied separately to one surface and allowed to dry. (The hardener-treated wood may be stored indefinitely.) The cement is applied to the opposing surface and, after a few minutes' air-drying, the joint is assembled and pressure applied within 10 minutes.

## MINIMUM SETTING TIMES UNDER PRESSURE (for all these methods)

2 hours at 80°F	8 hours at 50°F
3 „ „ 70°F	12-14 „ „ 40°F
6 „ „ 60°F	

## WITH HARDENER 50 (Brown)

This hardener is slower in action and should be used for large surfaces. The mixture consists of 1-oz. hardener per 1-lb. cement and remains usable for about :

1-1 $\frac{1}{2}$ hours at 80°F	4 hours at 65°F
2 „ „ 70°F	6 „ „ 60°F

*Method*—Application is similar to methods A and B for the rapid hardener except that longer time may elapse before the application of pressure (up to 45 minutes at 70°F. and longer still at lower temperatures). In every case pressure must be applied while the mixture is still tacky.

## MINIMUM SETTING TIMES UNDER PRESSURE

4 hours at 80°F	12 hours at 65°F
8 „ „ 70°F	18-24 „ „ 60°F

At lower temperatures Hardener 15 should be used.

## STORAGE AND HANDLING

**Beetle Cement A** *must be stored in a cool place* and should be used before the date shown on the container. Containers and mixing vessels should be of iron, tin, glass or earthenware (not copper or brass). No alkali of any description must come into contact with the cement, hardener or mixture.

It is important that all containers, mixing vessels and brushes should be washed out thoroughly with warm water before the cement has set.

Setting of the glue before assembly must be avoided. Cement and hardener mixture which has become very thick should not be used.

## SUMMARY

Beetle Cement A possesses all the advantages of **Beetle Cement W** (Kaurit) and, in addition, the quality of filling interstices. It is this quality which adds to its cost. It is more expensive but better.



SLIGHT PRESSURE IS SUFFICIENT *with Beetle Cement A.* It is only necessary to hold the joint firmly together until the cement has set. In practice this is done by means of screw presses, jigs and cramps.





BEETLE CEMENTS ARE STRONG. In the illustration opposite the load is supported by a 1-in. overlap joint. Above is a close-up of the joint—the penny gives the scale of this photograph. Loads expressed as pounds per square inch mean very little to most of us, but three large men standing on a good solid trolley look a very heavy load. Actually, if there had been room on the trolley, another three men could have been carried with ease.





**BEETLE**

**CEMENT W**

(formerly known by the German name KAURIT W)



# BEETLE CEMENT W

## BEETLE CEMENT W CAN BE USED FOR MANY MATERIALS

The use of this cement is not limited to wood only. It can be used, for instance, for cementing vulcanised fibre and cardboard and for sticking felt and other fabrics to wood, cardboard, etc.

## BEETLE CEMENT W WILL NOT DISCOLOUR WOOD

Unlike the majority of wood glues, Beetle Cement W is not alkaline. It neither discolours the wood nor does it adversely affect brushes.

## BEETLE CEMENT W IS POROUS

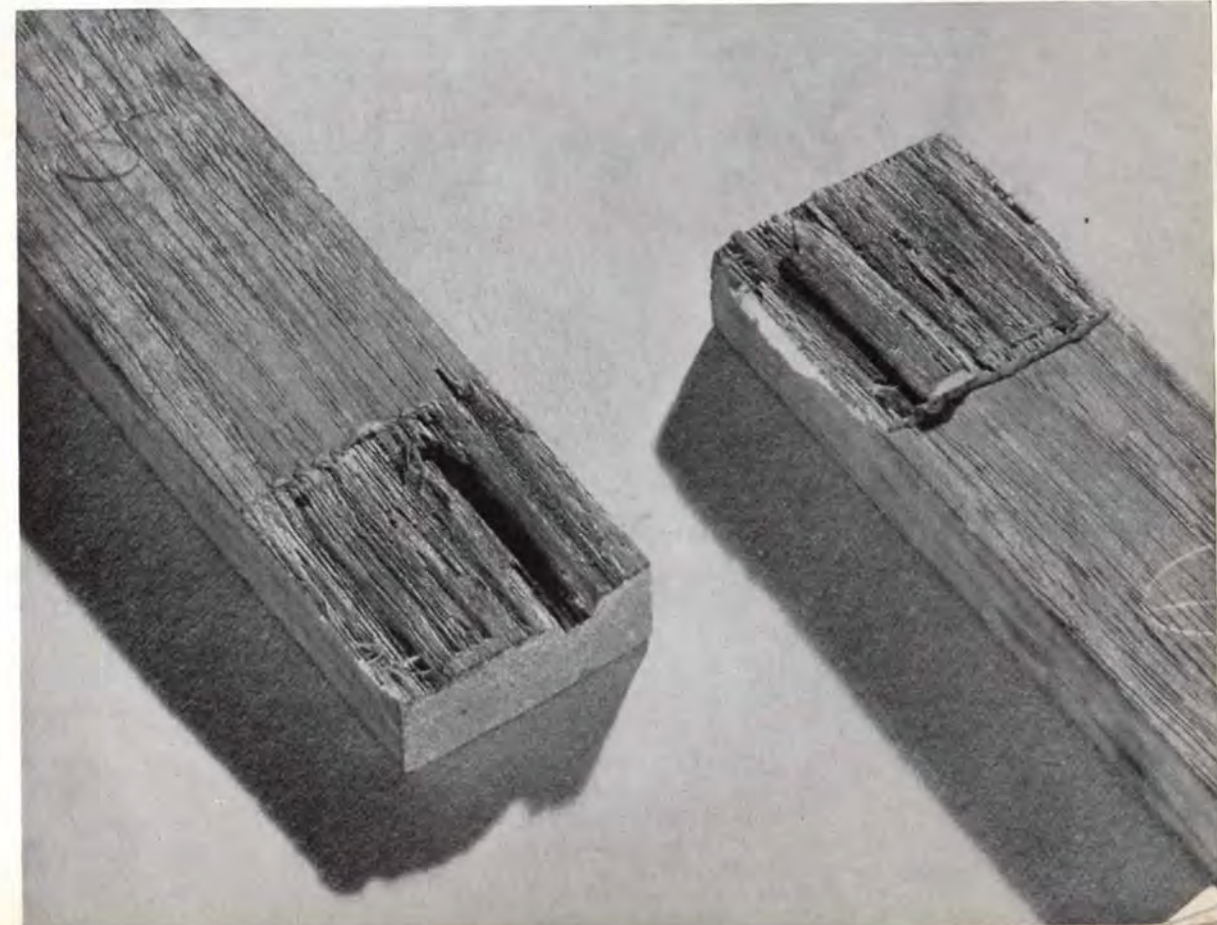
Another important advantage of Beetle Cement W is that it does not form an impermeable film between the two surfaces of wood but allows moisture and air to penetrate owing to its very finely porous structure. For this reason any swelling due to damp air, or shrinkage in dry air, does not cause stresses to be set up at the joints of the different layers of veneer.

## BEETLE CEMENT W CAN BE EXTENDED WITH RYE FLOUR

There are many purposes for which a completely waterproof cement is not necessary (furniture veneering is an example). In these cases it is a considerable economy to extend Beetle Cement W with Rye Flour. Although the water resistance of these joints is not so high as the pure Cement joint, yet even if equal parts of Rye Flour and Cement are

used it is still more water resistant than an ordinary casein glued joint. The addition of the flour makes only a very small reduction in the shearing strength of the joints. And economy is not the only advantage from the addition of Rye Flour—the mixture is very easy to brush and penetration through porous veneers is reduced.

STRENGTH IN SHEAR is determined on Walnut test pieces to Air Ministry Specification. The specimens break through wood failure at loads of 1,100–1,500 lbs. per sq. in.





# HOW TO USE BEETLE CEMENT W

This cement can be used under pressure either at normal room temperature or in a hot press. It is always used in conjunction with a 'hardener.'

## HOT PRESSING

Two types of hardener are available, the choice depending on whether the joint is to withstand boiling water or merely cold or warm water.

### PREPARATION

The following proportions are used :

			Parts by Weight
<i>For waterproof joints</i>	Beetle Cement W..	..	100
	Hot Hardener Liquid	..	10
<i>For joints to withstand boiling water</i>	Beetle Cement W..	..	100
	Hot Hardener 12 (powder)		10

These quantities are mixed thoroughly, and remain usable at a room temperature (70° F.) for 24 to 30 hours. No more of the mixture should be made up than can be used during the same day, but residues of the mixture remaining in the containers or troughs, *if kept cool*, may be blended next day with the fresh charge.

When mixing Hot Hardener 12 Powder into the cement the best

procedure is to stir the powder thoroughly into about one-third or half of the cement and then add the remainder to thin the mixture.

### APPLICATION

Beetle Cement W is applied very thinly. This thin application should be carried out by a spreading machine having metal or rubber rollers with very fine grooves of about 1 mm. width. It is possible to apply the Cement mixture with brushes or hand rollers, but it is difficult to obtain an even distribution of the very small amount necessary, and it is much slower than with a suitable mechanical spreader.

The mixture is applied to only one of the surfaces to be cemented. When manufacturing plywood only the core-stock is coated and when veneering, only the cross-banding. The usual roughening is unnecessary, sanding being sufficient.

### PRESSING

This is done in heated presses at a temperature of 90-100°C. (194-212°F.), and a pressure of 30 lbs. per square inch or more. The time of pressing depends on the thickness of the wood to be joined. Generally the minimum time allowed is :

5 minutes when using Hot Hardener Liquid

8     ..     ..     Hot Hardener 12

plus one minute for each millimetre (0.039 inch) wood, calculated to



the deepest joint from the surface. For example, the pressing time for an assembly comprising :

- Centre core of 20 mm. (0.78 in.)
- Cross-banding of 3 mm. (0.117 in.)
- Face-veneer of 0.8 mm. (0.034 in.)

is as follows :

	<i>Hot Hardener Liquid</i>	<i>Hot Hardener 12</i>
Minimum time	5 minutes	8 minutes
Cross-banding 3 mm.	3 "	3 "
Face-veneer 0.8 mm.	0.8 "	0.8 "
Total time of pressing	8.8 "	11.8 "
<i>Approximately</i>	9 "	12 "

When loading hot presses delay in closing the press must be avoided. The interval from start of loading to application of pressure should not exceed 2½ minutes.

Pressing may either be done immediately after application, or after a limited period of drying. At normal room temperature 20°C. (68°F.) up to 24 hours may elapse before pressing.

The wood can be used for further work immediately it is cool although the maximum strength of the joint is not developed for about 24 hours.

## VENEERING

**Beetle Cement W** is especially suitable for veneering with thin expensive wood, as the cement does not penetrate owing to the very thin layer

used. When using very thin and extremely porous wood, it is advisable to use rye flour as an extender.

## EXTENDING WITH RYE FLOUR AND WATER

The cement is first placed in the mixing vessel and the flour gradually stirred in. As the mixture becomes too stiff to stir a little water is added, but not too much or the flour will become lumpy. When all the flour has been added, the rest of the water is stirred in. This mixture will remain usable for about two days at normal room temperature, but should be stored in as cool a place as possible. After adding the hardener the mixture will not keep more than about eight hours. Three hardeners are available for hot-pressing these extended glues—Hot Hardener Liquid, Hot Hardener Brown and Cold Hardener White—the choice depending on the proportion of flour used and the heat available for pressing.

### VENEERING AT 90-100°C.

<b>1 Cement Mixture</b>	<i>Parts by Weight</i>
Beetle Cement W. . . . .	10
Rye Flour . . . . .	10
Water . . . . .	12
Hot Hardener Brown . . . . .	2

### 2 Application

Very thin—  
3-3½ lbs. per 100 sq. ft.

### VENEERING AT 70°C.

<b>1 Cement Mixture</b>	<i>Parts by Weight</i>
Beetle Cement W. . . . .	10
Rye Flour . . . . .	10
Water . . . . .	12
Cold Hardener White . . . . .	1

### 2 Application

Very thin—  
3-3½ lbs. per 100 sq. ft.



3 <i>Press Temperature</i> 90-100°C.	3 <i>Press Temperature</i> 70°C. minimum.
4 <i>Pressure</i> 35-40 lbs. per sq. inch on cemented surface.	4 <i>Pressure</i> 35-40 lbs. per sq. inch on cemented surface.
5 <i>Time Under Pressure</i> 9 minutes.	5 <i>Time Under Pressure</i> 7 minutes.

## COLD PRESSING

Three types of hardener are available :

COLD HARDENER ORANGE for very rapid working.

COLD HARDENER YELLOW for rapid working.

COLD HARDENER WHITE for slow working.

## PREPARATION OF SURFACE

Hard woods should be roughened.

Soft woods and veneers should be sanded.

## APPLICATION

The rapid cold hardeners must never be mixed with the Beetle Cement W but should only be used as follows :

### With Cold Hardener Orange

*Method*—The hardener is applied to one surface by means of a rubber sponge or soft brush, using about 1-lb. per 100 sq. ft. At the same time the Cement is spread on the other surface with a stiff bristle brush or rubber roller—about 2·5 – 3·0 lbs. per 100 sq. ft. After the cement has become tacky (about 15 minutes) the two surfaces are brought into contact and **pressure must then be applied within 3 minutes.**

#### MINIMUM SETTING TIMES UNDER PRESSURE

20 minutes at 70°F.

30 „ „ 60°F.

45 „ „ 50°F.

### With Cold Hardener Yellow

*Method A*—The hardener is applied to one surface as described above and is allowed to dry thoroughly (at least 30 minutes). The hardener treated surfaces may be stored for several days if desired. **They should never be rubbed down** but any dust should be removed with a soft brush before cementing. The Cement is applied to the other surface and after it has become tacky (about 15 minutes) the two surfaces are brought into contact. **Pressure must then be applied within 15 minutes.**

*Method B*—The hardener is applied to one surface and allowed to dry thoroughly. Cement is then applied to the same surface and the other untreated surface brought into contact with it. **Pressure must**



be applied within 15 minutes of the time of commencing spreading the Cement on top of the hardener.

*Method C*—It is not essential to dry the hardener coated surface thoroughly and the method described for Cold Hardener Orange can be used equally well with Cold Hardener Yellow. **Pressure must be applied within 15 minutes of bringing the surfaces together.**

MINIMUM SETTING TIMES UNDER PRESSURE (for all three methods)

1½	hours at 70°F
3	„ „ 60°F
5-6	„ „ 50°F

#### With Cold Hardener White

All three methods described for Cold Hardener Yellow may be used. **Pressure must be applied within 45 minutes of bringing the surfaces together.**

In addition it is sometimes convenient for special purposes to use a mixture of Cement W and Cold Hardener White thereby saving a separate coating with hardener. A mixture of 100 parts of Cement W and 10 parts Cold Hardener White is made and this mixture remains usable for about 1½ hours at 70° to 80°F. (No attempt should be made to use the cement mixture once it has set or become very thick.) The mixture is spread on one surface and **pressure applied within 45 minutes.**

MINIMUM SETTING TIMES UNDER PRESSURE

4	hours at 70°F
12	„ „ 60°F
30-35	„ „ 50°F

The advantage in using Cold Hardener White is that sufficient working time is available to permit spreading of very large surfaces, loading of multi-daylight presses, etc.

#### EXTENSION WITH RYE FLOUR

For cheap cold setting glues Beetle Cement W may be extended with rye flour as in the hot process. The hardener (Cold Hardener White or Cold Hardener Yellow) is usually added to the mixture in this case. Ten per cent. of Hardener calculated on the weight of Cement W is always used. Three typical mixtures with the minimum setting times at 70°F. are given below :

					Parts by Weight
1	Beetle Cement W	.	.	.	100
	Rye Flour	.	.	.	30
	Water (approximately)	.	.	.	30
	Cold Hardener White	.	.	.	10
	Minimum Pressing Time at 70°F. 5 hours.				
2	Beetle Cement W	.	.	.	100
	Rye Flour	.	.	.	50
	Water (approximately)	.	.	.	50
	Cold Hardener White	.	.	.	10
	Minimum Pressing Time at 70°F. 6 hours.				



					<i>Parts by Weight</i>
3	Beetle Cement W	.	.	.	100
	Rye Flour	.	.	.	100
	Water (approximately)	.	.	.	120
	Cold Hardener Yellow	.	.	.	10

*Minimum Pressing Time at 70°F.* 5 hours.

The working time, during which the mixture remains usable, is approximately equal to the minimum pressing time in each case.

For rapid production Cold Hardener Orange may be used but must be applied separately to one surface, the glue mixture being spread on the other surface.

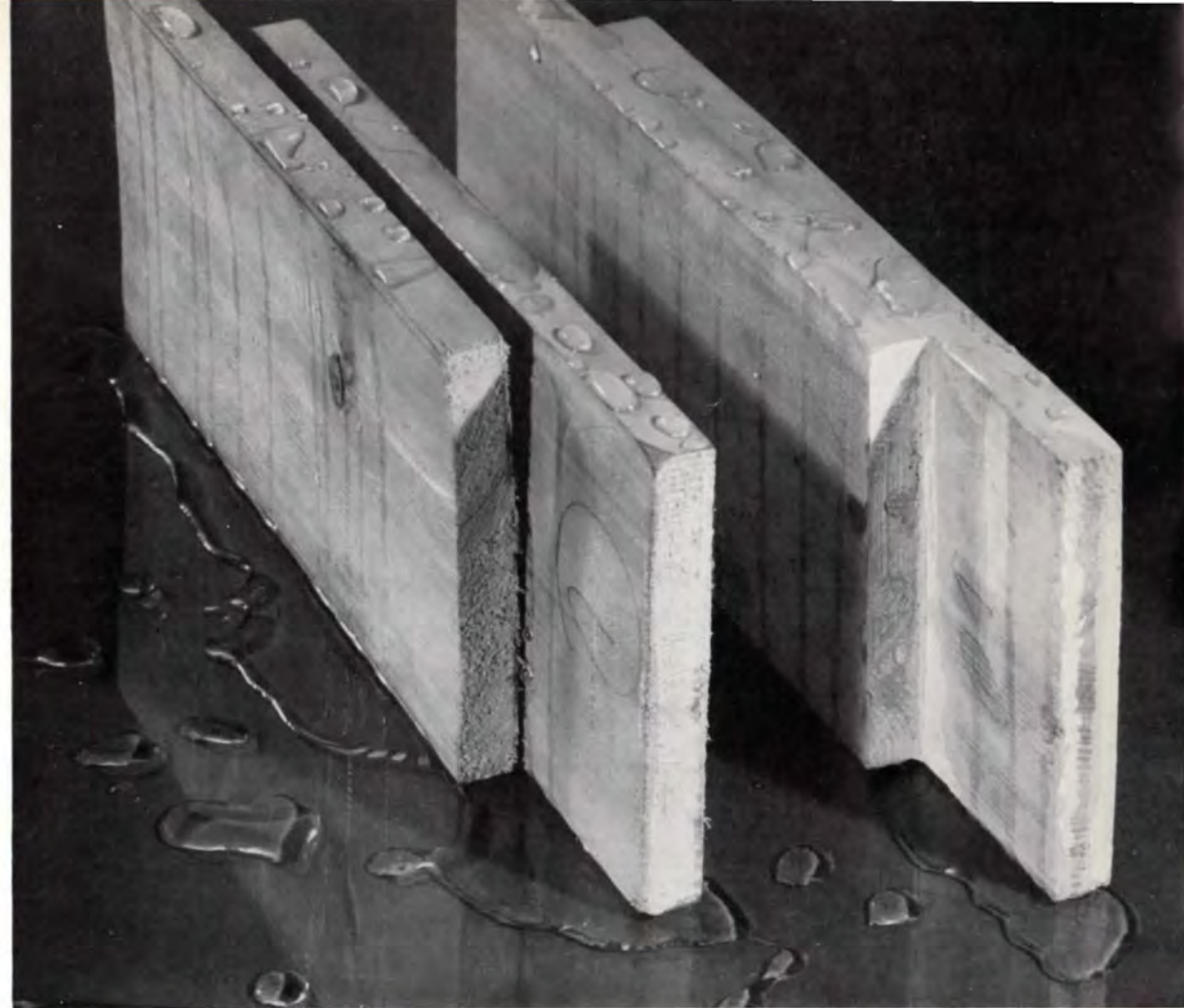
With a mixture of Beetle Cement W 100 parts  
Rye Flour 100 „  
Water 100-120 „

pressure must be applied within 3 minutes after assembling. Minimum setting time under pressure at 70°F. 45 minutes.

## STORAGE AND HANDLING

**Beetle Cement W** *must be stored in a cool place* and should be used before the date shown on the container, which is about three months after manufacture. Containers and mixing vessels should be of iron, tin, wood, glass or earthenware (not copper or brass). No alkali of any description must come into contact with the Cement, the hardener or the mixture.

It is important that all containers, mixing vessels and brushes after use should be washed out thoroughly with warm water before the mixture has set.



BEETLE CEMENTS ARE WATERPROOF. *The effect of a few weeks' immersion in water on (left) a casein joint and (right) a Beetle Cement joint.*



# HARDENERS FOR USE WITH BEETLE CEMENTS

## BEETLE CEMENT A — Cold Setting

<i>Name of Hardener</i>	<i>Application</i>
<b>HARDENER 15 (Purple)</b> . . . . .	Rapid setting hardener for aircraft and general constructional work.
<b>HARDENER 50 (Brown)</b> . . . . .	Slow setting hardener for aircraft and general constructional work where large surfaces have to be spread or assembly is necessarily slow.

## BEETLE CEMENT W — Cold Setting

<b>COLD HARDENER ORANGE</b> . . . . .	Ultra-rapid hardener for use by separate application method in furniture and joinery trades. Coloured to stain the wood so that spreading of the hardener may readily be seen.
<b>COLD HARDENER OSM</b> . . . . .	Untinted form of Cold Hardener Orange.
<b>COLD HARDENER RED</b> . . . . .	General purpose rapid hardener for use by separate application method. Coloured to stain the wood.
<b>COLD HARDENER YELLOW</b> . . . . .	Lightly tinted form of Cold Hardener Red.
<b>COLD HARDENER Y</b> . . . . .	Untinted form of Cold Hardener Red.
<b>COLD HARDENER BLUE</b> . . . . .	General purpose slow hardener for use by separate application method—may also be mixed with the cement for special purposes. Coloured to stain the wood.
<b>COLD HARDENER WHITE</b> . . . . .	Untinted form of Cold Hardener Blue.

## BEETLE CEMENT W — Hot Setting

<i>Name of Hardener</i>	<i>Application</i>
<b>HOT HARDENER LIQUID (Pink)</b> . . . . .	General purpose hot hardener—used mixed with the cement—for plywood, veneering, etc.
<b>HOT HARDENER 12 (Powder)</b> . . . . . (Patented)	For joints resistant to boiling water and plywood to Air Ministry Specification 5V3 (see page 30 for full details).
<b>COLD HARDENER WHITE</b> . . . . .	For pressing at moderate temperatures (70°-80°C.). Cold Hardener White is frequently used in place of Hot Hardener Liquid to shorten pressing times.

## Cheap Mixture of Beetle Cement W and Rye Flour — Cold Setting

<b>COLD HARDENER ORANGE</b> . . . . .	By separate application method.
<b>COLD HARDENER YELLOW</b> . . . . .	By separate application method or mixed with the glue mixture.
<b>COLD HARDENER WHITE</b> . . . . .	By separate application method or mixed with the glue mixture.

## Cheap Mixture of Beetle Cement W and Rye Flour — Hot Setting

<b>HOT HARDENER BROWN</b> . . . . .	General purpose hot hardener for extended Cement W—used mixed in the glue mixture.
<b>HOT HARDENER LIQUID</b> . . . . .	Where the proportion of rye flour is less than 1 part to 2 parts of cement, Hot Hardener Liquid is employed in place of Hot Hardener Brown.
<b>COLD HARDENER WHITE and COLD HARDENER YELLOW</b>	For pressing at moderate temperatures (70°-80°C.) one of the cold hardeners is used in place of Hot Hardener Brown. The white hardener is used where there is more cement than rye flour and the yellow hardener for mixtures consisting mainly of rye flour.



## HOT HARDENER 12 (Patented)

Hot Hardener 12 is a powder hardener for Beetle Cement W which is capable of giving joints resistant to boiling water as required by Air Ministry Specification 5V3.

The development of this hardener is purely British and is the outcome of considerable research in the Beetle laboratories. The new hardener is moderate in price and is much more economical in use than the hardener formerly employed for this application. The latter was of German origin and was based on expensive chemicals.

The glue mixture consists of :

Beetle Cement W 100 parts

Hot Hardener 12 10 parts

and is prepared by stirring all the powder with about one-third of the cement until a uniform thick paste is obtained and then mixing in the remainder of the cement. This mixture may be a little too thick for some spreading machines in which case it is permissible to add up to 10% of water on the weight of Cement W to adjust the viscosity. The mixture is spread at the rate of 3 lbs. per 100 sq. ft. (150 gms. per sq. metre) and pressed at 90°-100°C. under a pressure of from 30-200 lbs. per sq. in. (2-14 kgms. per sq. cm.) for eight minutes basic curing time plus one minute extra for each mm. thickness of wood to the deepest glue line. Temperatures below 90°C. are not recommended ; shorter pressing times may be obtained at higher temperatures. When the

surface veneers are 1 mm. or less the work should not lie on the hot platens for more than one minute before pressure is applied, otherwise premature setting of the cement may arise ; extra latitude of 1 minute per mm. additional thickness of surface veneers may be allowed but must not be exceeded.

The mixture remains usable for more than 24 hours at ordinary temperature (70°F.) and up to 18 hours may elapse before pressing the boards or veneers after the glue has been spread.

Typical shear tests are as follows :

BIRCH 3-PLY 1½ mm. VENEER		<i>Tested wet immediately after 3 hours boil :</i>		
Original	355 lbs.	Wood failure	299 lbs.	Glue and Fibres
	361 lbs.	„ „	256 lbs.	„ „ „
	312 lbs.	„ „	271 lbs.	„ „ „
<hr/>		<hr/>		
Average	343 lbs. per sq. in.	Average	275 lbs. per sq. in.	

Converted to the metric system the above figures give :

BIRCH 3-PLY 1½ mm. VENEER		<i>Tested wet after 3 hours boil :</i>	
Original	Average 24.2 kgms.	Average 19.3 kgms.	
	per sq. cm.	per sq. cm.	

The above figures were obtained according to the method of test of B.S. 4V3 which called for a minimum shear test of 200 lbs. per sq. in. (14 kgm. per sq. cm.) dry and 100 lbs. per sq. in. (7 kgms. per sq. cm.) after 3 hours boiling.



## BEETLE CEMENTS FOR AIRCRAFT CONSTRUCTION

### TESTED TO SPECIFICATION D.T.D. 335

Beetle Cement A, Cold Hardeners V15 and B50, Beetle Cement W, Cold Hardeners Red and Blue can all be supplied tested to Air Ministry specification D.T.D. 335. The necessary A.I.D. Release Notes are issued by British Industrial Plastics Ltd. (Beetle Products Division) under Air Ministry Authority Ref. 667869/37.

Orders for Cements and Hardeners to specification D.T.D. 335 should be addressed to British Industrial Plastics Ltd. (Beetle Products Division) Oldbury or to the sole agents: The Barter Trading Corporation Ltd., 14, Waterloo Place, London, S.W.1.

## BEETLE CEMENTS FOR AIRCRAFT PLYWOOD

Home production of plywood has recently received a big impetus owing to the demands of the aircraft industry and the reduction of Continental supplies. The advantages of Beetle Cements for this application are proving most opportune. Film glue of the phenolic type requires conditions of temperature and pressure outside the scope of plant designed and used for veneering with the natural glues. The properties of skin glue are generally well below the standard for aircraft requirements. But with Beetle Cements it is now possible for all this plant to be brought into commission on work of national importance.

### SPECIFICATION B.S. 5V3 • Plywood for Structurally Important Parts of Aircraft.

Beetle Cement W with Hot Hardener 12 has been approved by the Ministry of Aircraft Production (Authority Ref. 398327/38/R.D.M.) for the manufacture of plywood to specification 5V3. Plywood made with this mixture is fully resistant to the three hour boiling water test in the specification.

### SPECIFICATION D.T.D. 427 • Plywood for lightly stressed parts of Aircraft.

Beetle Cement W with any suitable Beetle Hardener (usually Hot Hardener Liquid or Cold Hardener White) has been approved by the Ministry of Aircraft Production (Authority Ref. B. 83570/40/RDM/ACG) for the manufacture of plywood to specification D.T.D. 427. Plywood made with this mixture is fully resistant to the action of hot water (60°C.) for 3 hours.

## B E E T L E C E M E N T H

### A POWDER FORM OF BEETLE CEMENT W WITH EXCELLENT KEEPING QUALITIES

Beetle Cement H is a powder glue which when mixed with cold water in suitable proportions, gives a liquid glue with all the desirable properties of Beetle Cement W. The powder keeps almost indefinitely if stored in a cool dry place and provides a ready means of producing at any time a supply of fresh liquid glue. The advantages of this over Beetle Cement W with its limited keeping properties as a liquid glue are obvious and are particularly important for export.

Many users of Beetle Cement W in this country will also appreciate the convenience of being able to stock the glue in dry form ready for use by mixing with water as required. The mixing operation is very simple and can easily be conducted in the vessel normally used to incorporate the hardener with the glue. After mixing with the requisite quantity of water Beetle Cement H is treated as if it were Beetle Cement W. It can be used in conjunction with any of the different hardeners and by the hot or cold processes exactly as Beetle Cement W.

### HOW TO USE BEETLE CEMENT H

A mixture of 100 parts by weight of Beetle Cement H.

70 „ „ „ „ Cold water

is stirred together for two or three minutes and allowed to stand for fifteen minutes. The result is a liquid glue free from lumps which is similar to Beetle Cement W, and it may then be used in the same ways as the latter.



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