



**InstaBead**<sup>®</sup>  
CAVITY WALL INSULATION

Installer manual  
**InstaBead**

BBA Certificate No: 15/5258 InstaBead  
KIWA BDA Certificate BAW-18-082-S-A-UK

**InstaGroup**

[www.instagroup.co.uk](http://www.instagroup.co.uk)

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# The Company

InstaBead is a division of the Insta Group of Companies based at Wokingham in Berkshire.

InstaBead supplies a range of products and machinery to a network of approved installing companies throughout the United Kingdom and Southern Ireland.

InstaBead products for Cavity Wall Insulation are British Board of Agrément approved in conjunction with specified machinery.

All commercial and technical enquiries concerning the InstaBead Cavity Wall Insulation system should be addressed to:



InstaBead  
Insta House, Ivanhoe Road  
Hogwood Business Park  
Finchampstead, Wokingham  
Berkshire RG40 4PZ  
United Kingdom



**+44 (0)118 932 8811**



**sales@instagroup.co.uk**



**www.instagroup.co.uk**

# InstaBead Cavity Wall Insulation System

InstaBead is an expanded polystyrene bead coated with an approved adhesive. InstaBead is injected into the cavity wall of a building to reduce thermal heat loss.

## InstaBead

Polymer granules, which in their raw state are known as salts or sugars, are passed through a steam process. The raw material contains penthane which, when heated, causes the granules to expand to between 40-60 times their original size. The granules are processed twice to produce a finished bead in the specified range of 2-8mm and with a density of 12kg/m<sup>3</sup> (+/- 2kg/m<sup>3</sup>).

Each delivery of InstaBead should be checked upon receipt to determine that the material complies with the above specification.

The size of the material is checked visually and samples measured by sieving it through a mesh. The density of the bead is determined by filling a known volume of area with dry bead and then weighing the contents.

## InstaBead Adhesive

The InstaBead adhesive is delivered in a dilute state, which is ready for use in either 200kg drums or 1 tonne IBC containers.

The adhesive must not be allowed to freeze or come into contact with extreme heat. Ideally it should be kept at a temperature of between 10-20°C.

The adhesive is decanted into smaller drums, which are more easily used on the installation vehicle when filling the adhesive pressure vessel.

When examined the adhesive will be creamy white in colour and should contain no sediment or lumps, which could block the adhesive lines and jets in the injection guns.

The effectiveness of adhesive can be tested in two ways:

- i) Spread a thin layer of undiluted adhesive onto a non-porous surface such as glass or metal and allow to dry. The adhesive will form a clear film, which must adhere to the surface and be totally free from any sediment or other particles.
- ii) Blow InstaBead, coated with adhesive, into a test box of a determined size. When dry the box may be opened and the contents examined in their "bonded" state. If the bonded material is carefully removed it can be weighed to determine the density of the bead in its installed form as opposed to its dry density.



# Equipment Check List

To undertake an effective and professional installation of InstaBead Cavity Wall Insulation the following equipment will be required.

## Installation Equipment

- Compressor (Minimum 7 bar constant).
- Adhesive Pressure Vessel
- Bead Delivery Hose, Air Lines and Adhesive Lines
- Injection Gun
- Injection Nozzles
- Range of Adhesive Spray Jets, small adjustable spanner and Hex (Allen) key.
- HSE approved extending ladders)
- Additional approved access equipment as required
- Drilling Machine (Heavy duty, 110v single phase electric with safety clutch).
- Drilling Bits (22mm)
- Borescope and inspection lamp/torch
- Cavity Brushes (plus lines and weights)
- Mesh Bag (for testing Bead flow rate)
- Weighing Scales (0-2kg)
- Measuring Jug (for testing adhesive flow rate)
- Stopwatch
- Airbrick Sleeving Material (Plastic barrier inserts)
- Meter Box Key
- Smoke pellets and matches

## Making Good Equipment

- Bucket, trowel, mortar hawk, sand, cement, range of colour pigments, range of rendering finishes, air bricks or sleeving device.
- Tool kit including hammer, chisel, spanners, screwdrivers, hacksaw, pliers, water hose, hose couplings, yard brush, shovel, dustpan and brush and tape measure.

## Safety Equipment

- Ladder safety harness and ladder safety ties
- Hardhat
- Ear protectors
- Goggles
- Dust masks
- Safety shoes
- Protective clothing
- First Aid kit



The above is not an exhaustive list of equipment that you may be required to use.

All aspects of safety must conform to the current Health and Safety at Work Act regulations.

It is advised that you acquaint yourself with and understand your own company's current safety policy manual.

# Site Preparation

Before installation commences each building must be assessed individually to ensure that it is suitable for Cavity Wall Insulation and all details must be recorded on an appropriate survey form.

This suitability is assessed in conjunction with reference to the following publications:

- BBA Agrément Certificate 15/5258 & KIWA BDA Cert BAW-18-082-S-A-UK – InstaBead White, InstaBead Carbon Saver and InstaBead Diamond Cavity Wall Insulation system.
- IAA Assessors Guide – Suitability of external walls for filling with Cavity Wall Insulation.
- IAA Technicians Guide – Installing Cavity Wall Insulation.
- IAA Technicians Guide – Flues, chimneys and combustion air ventilators.

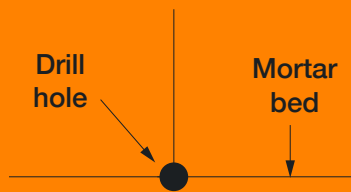
To avoid any leakage of InstaBead during the installation process it is important that both external and internal checks are carried out as detailed in the IAA Technicians Guide, (Installing Cavity Wall Insulation).

Even when being installed with the correct application of adhesive, InstaBead is an extremely free flowing material. It is, therefore, extremely important to determine that the cavity is sealed in all areas, i.e. eaves, around waste pipes and meter boxes, etc.

It is imperative that the position of all flues, chimneys and combustion air ventilators are located, recorded and addressed to comply with the IAA Technicians Guide, (Flues, chimneys and combustion air ventilators).

# Drilling Pattern

To prevent undue damage to bricks or excess debris falling into the cavity, 22mm holes are drilled into the mortar joints at the point where the vertical mortar joint meets the horizontal mortar bed, eg:



## Doors, Windows and Cavity Closures

Where there are doors, windows or cavity closures, additional holes are required around building features to ensure a complete cavity fill.

## Doors and Windows

Holes will be drilled no lower than 300mm below the lintels and no further than 450mm away from the lintel (see diagram 4B).

## Plain Walls

On a two-storey cavity wall which has no openings or closures, ie, doors and windows, the first line of injection holes will be no more than 300mm below and not adjacent to the ceiling joists of the ground floor to ensure no material ingress into the ceiling void. They will be no more than 1.5 apart horizontally and no further than 500mm from the ends of the wall (see diagram 4A). The second row of injection holes will be no lower than 300mm from the top of the external wall and no more than 700mm apart horizontally (see diagram 4A), finishing no further than 500mm from the ends of the wall.

## Windows

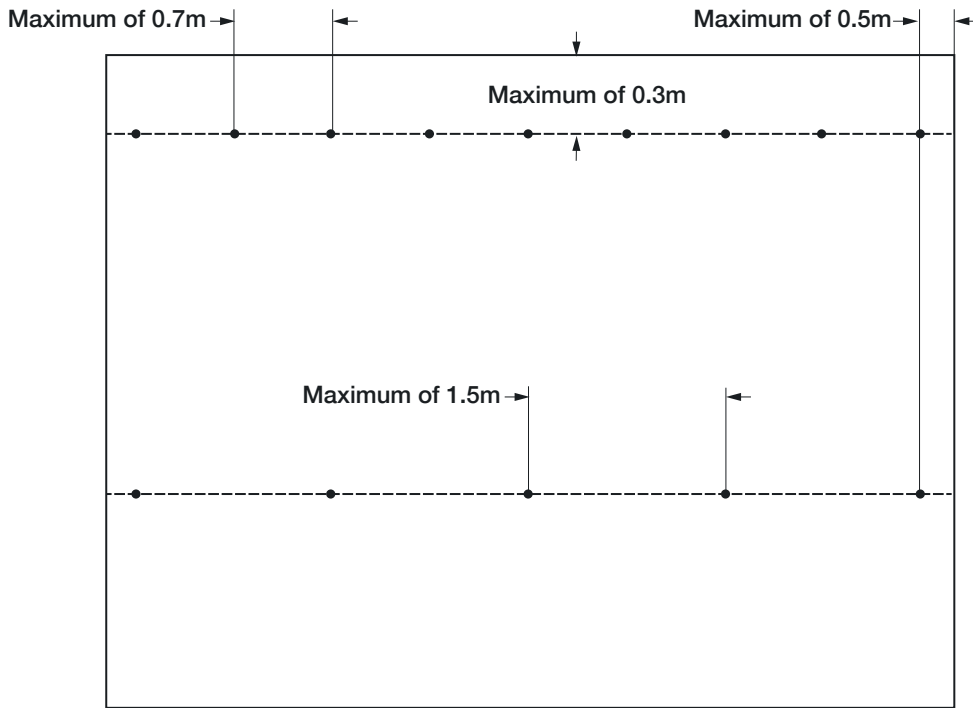
Below windows, holes will be drilled no lower than 300mm below the window and no further apart than 700mm, finishing no further than 450mm from the edge of the windows (see diagram 4C).

## Cavity Closures

(eg, Vents, outlet pipes, balanced flues). An injection hole will be drilled in close proximity to the underside of any cavity closure no lower than 300mm below and no further away than 450mm to ensure the fill of the cavity (see diagram 4B).

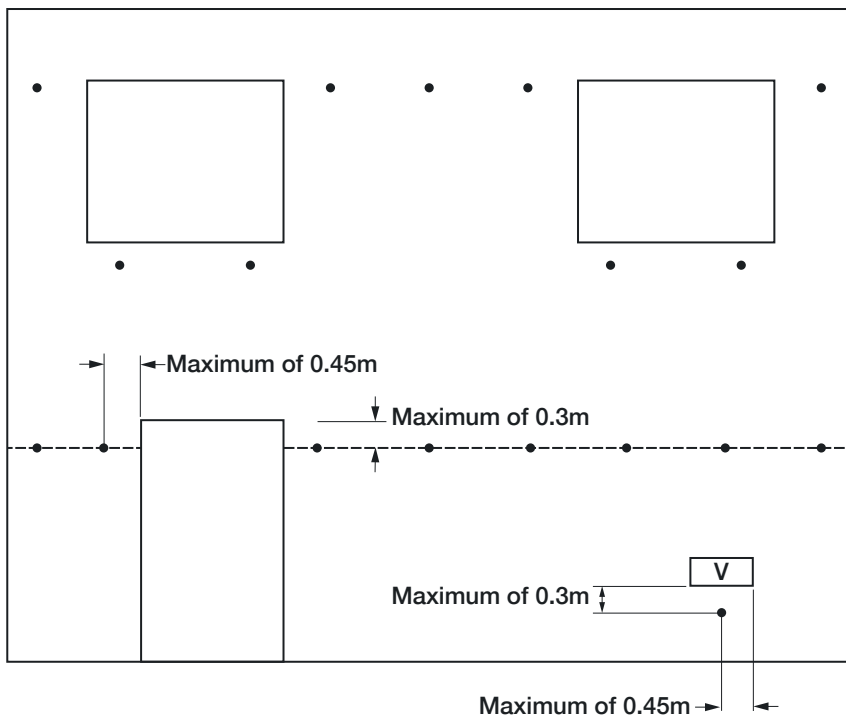
# InstaBead Injection Drilling Pattern

Diagram 4A – two storey property



# InstaBead Injection Drilling Pattern

Diagram 4B – two storey property



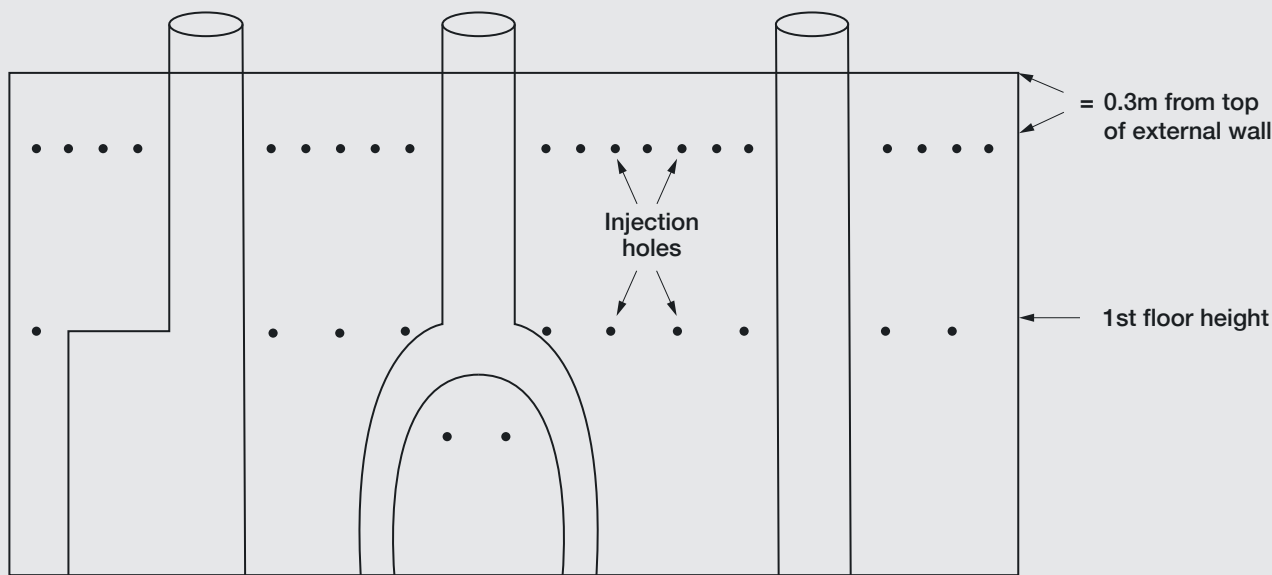
V = Vent or balanced flue i.e. an isolated cavity closure



## Chimneys and Flues

When carrying out the internal pre-installation checks, note the position of chimneys and/or flues. Take measurements so that this information can be used to locate the chimney/flue on the external wall face. The drill pattern is then amended to ensure the areas to the sides of the chimney/flue are completely filled with insulation without having to drill directly on the line of the chimney/flue.

Examples of drilling pattern around chimney/flues:



Drill holes must not be on the line of chimney or flue unless care has been taken to ascertain the cavity is continuous, e.g. do not drill in line with a pot-block chimney construction.

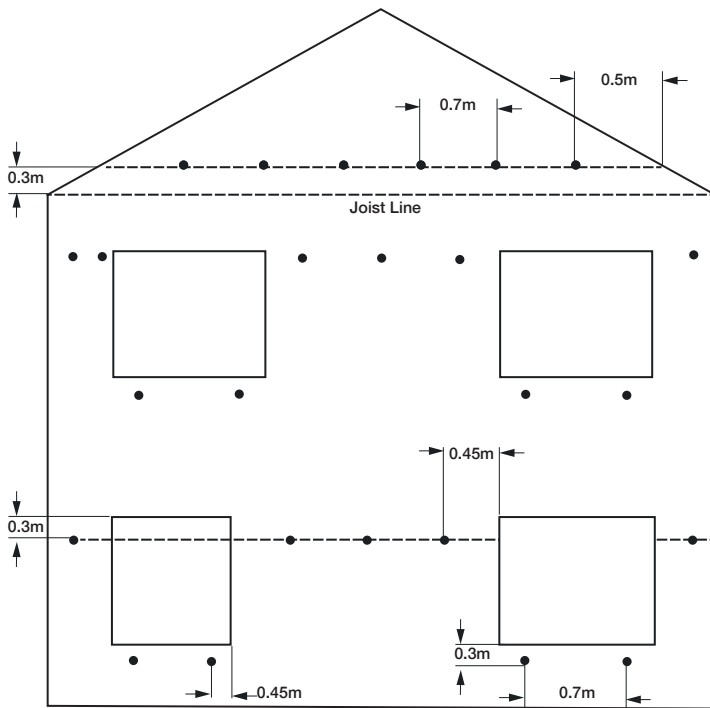
## Gables

If a loft is not used as a living space, eg, dormer room or is not a “warm” loft, ie, Loft Insulation attached to the underside of the roof, then the final line of injection holes will finish no less than 300mm above the ceiling joists and no further apart than 700mm finishing no further than 500mm from the tiles or edge of the building (see diagram 4C).

If a loft is being used as a living space or is a “warm” loft, then injection holes must be drilled on a line parallel with the pitch of the roof, no lower than 300mm from the tiles and no further apart than 1m (see diagram 4D).

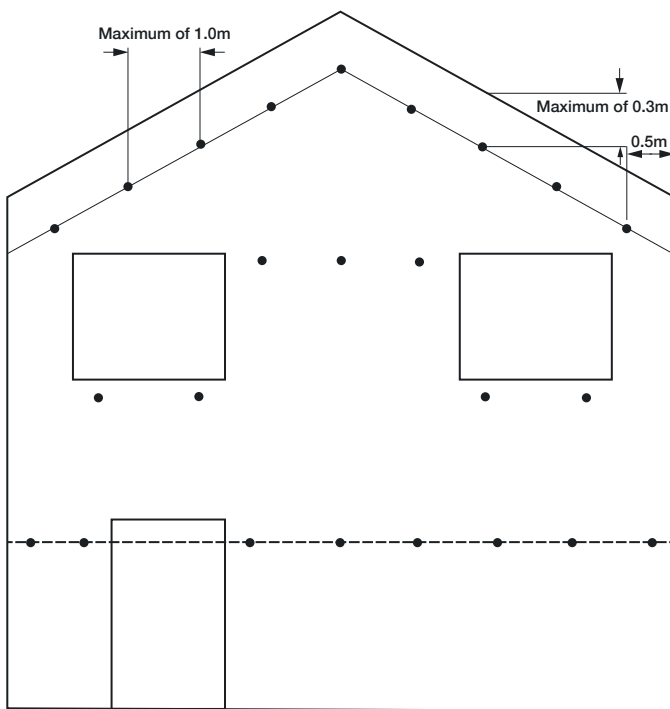
# InstaBead Injection Drilling Pattern

Diagram 4C



# InstaBead Injection Drilling Pattern

Diagram D



# Installation Equipment

## Compressor

The compressor provides air for the system, which is used either to pressurise the adhesive pressure vessel or provide air to the injection gun to allow the bead to be drawn from the installation vehicle, along the delivery hose and blown into the cavity wall. The pressure gauge on the compressor should read a minimum of 7 bars under all working conditions.

## Adhesive Pressure Vessel

The adhesive is contained in a pressurised vessel, which is normally made from stainless steel. This vessel consists of a sealable lid, which is used for filling and cleaning, an air inlet valve, an air release valve, a pressure gauge, a vent and safety valve, an outlet valve and a drain valve at the bottom of the vessel.

Under normal working conditions the adhesive pressure vessel should work at a pressure of between 65-85 psi.

The safety valve on the adhesive pressure vessel must be set to operate at a pressure of 6 bars.

## Bead Delivery Hose

The bead delivery hose is a 38mm reinforced polyurethane hose.

The standard 30mm or 45mm lengths for each outlet consist of lengths connected by a hose connector. Additional 15mm lengths may be added to the standard (up to 60mm) if for example access is restricted.

## Air Line

The air line is supplied in 30mm or 45mm lengths (two x 15mm) and is complete with hose tail fittings.

## Adhesive Line

The adhesive line is a clear braided PVC hose supplied in standard lengths of 30m or 45m complete with hose tail fittings.

## Injection Gun

The injection gun is the connection point for the bead delivery hose, the air line and the adhesive line.

The injection gun is designed so that when the injection gun is provided with compressed air via the air line, a part vacuum is created. The vacuum draws the InstaBead from the installation vehicle along the bead delivery hose.

The adhesive, under pressure from the adhesive pressure vessel, is introduced into the injection gun where a fine spray coats the bead as it passes through the gun and is blown into the cavity through the injection nozzle.

# Quality Checks

It is important that the ratio of bead to adhesive is correct to ensure that the bead is coated with sufficient adhesive to bond together correctly and to achieve the specified thermal performance.

## Bead and Adhesive Flow Rate Tests

These tests must be carried out at the beginning of every installation to ensure that materials and machinery are performing within specification. The results from these tests must be recorded on relevant paperwork to comply with the BBA technical schedules and industry requirements.

Fill and connect the adhesive pressure vessel and installation equipment to the compressor. Check that the compressor is running at 7 bar and pressurise the adhesive pressure vessel.

## Adhesive Flow Rate Test

With the adhesive pressure vessel pressurised to 5 bar (75psi) open the valve on the adhesive line at the injection nozzle and ensure that a fine steady spray of adhesive is being produced. Spray the adhesive into a clean measuring cylinder for a period of 30 seconds. Multiply the result by two to give a flow rate of adhesive per minute.

Compare the adhesive flow rate and the bead flow rate with the InstaBead flow rate table to confirm that sufficient adhesive is being sprayed in relation to the volume of bead being delivered.

Adjustments may be made to the bead flow rate by altering the pressure valve on the air line from the compressor.

Minor adjustments may be made to the adhesive flow rate by altering the inlet pressure being provided to the adhesive pressure vessel. Further adjustments to the adhesive flow rate may be made by changing the size of the spray jet (4.5-6).

## InstaBead Flow Rate Test

The density of the bead shall have been determined at the point of delivery.

Blow dry bead (without adhesive) into a fine mesh bag of a known weight for 30 seconds. Weigh the filled bag and deduct the weight of the mesh bag. Multiply the result by two to give a flow rate of bead per minute. The bead flow rate should be in the range of 0.6kg per minute to 1.5kg per minute.

## Bead Bonding Test

Once the bead and adhesive flow rates correspond with the Flow Rate Table a further small sample of coated bead is blown into another small test bag.

When touched the coated bead should have a damp feel and should stick together when pressed against a solid surface.

# InstaBead Flow Rate Table

Bead to Adhesive	
Bead Flow Rate – kg per minute	Adhesive Flow Rate – ml per minute
0.6	140
0.7	155
0.8	170
0.9	185
1.0	200
1.1	220
1.2	240
1.3	260
1.4	280
1.5	300
1.6	320
1.7	340
1.8	360
1.9	380
2.0	400



It may be necessary to alter the jet size in the injection gun to achieve the correct adhesive flow rate. It is a requirement that flow rate tests are carried out and recorded for each installation.

It is important that the flow rates are monitored carefully throughout the day to ensure that the flow of bead and adhesive remains constant and are installed in the correct proportions to achieve an effective installation.

# The Filling Operation

Before the filling operation commences it is important that a sufficient area of wall has been drilled to ensure that any debris caused by further drilling will not fall into the cavity and settle on the installed bead.

The injection holes must be filled in an order that ensures a consistent and complete fill.

Bead and adhesive should be injected into each hole in turn, starting at the lowest row of injection holes at one end of an elevation and working across from side to side.

Care must be taken to ensure that filling has taken place at the lower injection holes on an elevation where material injected at a higher level on a different elevation may travel around the corner of the building and obscure the other injection holes.

To prevent the adhesive from coating the inside of the injection gun, causing possible adhesive spillage or blockages, the following sequence of operation should be adopted:

## To start the filling operation

- Insert the injection nozzle into the injection hole to be filled.
- Turn on the air valve. (Bead will be drawn into the injection gun).
- Immediately (on sight of bead being injected) turn on the adhesive valve.
- Bead and adhesive will be blowing into the cavity wall area.
- When the injection hole has been completely filled the flow of bead will automatically be halted and there will be a blow back of air.

## To end the filling operation

- Immediately turn off the adhesive valve.
- Turn off the air valve.
- Remove the injection nozzle from the filled hole and move to the next injection hole.

During the filling operation the Technician should be constantly checking that the flow of bead and adhesive remains constant.

The flow of bead may be viewed via the clear delivery hose where it joins the injection gun.

The flow of adhesive may be monitored by checking the adhesive flow gauge, which is situated at the injection gun end of the adhesive line.

It is also important to frequently check that the spray pattern coming from the adhesive spray jet remains consistent to ensure that the bead is coated in a uniform manner.



# Cleaning and Storage of Equipment

On completion of each day's work the adhesive line and the injection gun should be thoroughly cleaned before storing.

Under no circumstances allow adhesive to remain in the adhesive vessel or adhesive line if freezing temperatures are expected.

## Cleaning the adhesive vessel and adhesive line

- Unscrew and remove the adhesive line and spray jet from the injection gun.
- Pump remaining adhesive from the adhesive vessel and adhesive line into a small plastic drum via the drain plug or ball valve on adhesive line).
- De-pressurise the adhesive vessel.
- Fill adhesive vessel with approximately 5 gallons of clean water.
- Clean inside of pressure vessel by hand.
- Re-pressurise the adhesive vessel.
- Flush adhesive vessel and adhesive line thoroughly with clean water to prevent the adhesive from freezing or crystallising, which could cause blockages the following day.

## Cleaning the bead delivery hose

- Close the bead supply outlet to delivery hose. (Either close slide or plug outlet).
- Detach the delivery hose from the supply outlet.
- Blow any dry bead remaining in the delivery hose into a vented bag. (Beads can be re-used).

## Cleaning the injection gun

- Strip the injection gun down into individual parts and wash thoroughly in water to remove all traces of adhesive.
- If necessary the adhesive spray jet and filter may be stored in water, solvent or a weak mixture of water and antifreeze overnight.

# Installed Density and Usage

InstaBead is delivered to site in its expanded form and has a density of 12kg/m<sup>3</sup> (+\ - 2).

## InstaBead Coverage

For an installed density of 12kg/m<sup>3</sup> the following coverage should be obtained per m<sup>3</sup> of InstaBead\*

Cavity Width – mm	50	55	60	65	70	75	80	85	90	100	110	125
Coverage – m <sup>2</sup> per m <sup>3</sup>	20.00	18.18	16.67	15.38	14.28	13.33	12.50	11.76	11.11	10.00	9.09	8.00

\*When InstaBead is coated with the adhesive in the ratios specified in the InstaBead rate table a 15% increase in coverage is achieved.

Cavity widths can vary considerably within one building. Cavity widths tend to increase the greater the distance from ground level. At least 10 measurements should be made at various heights in the building to obtain a realistic average.

\* When InstaBead is coated with the adhesive in the ratios specified in the InstaBead Rate Table a 15% increase in coverage is achieved.

## Adhesive Usage

For an installed density of 12kg/m<sup>3</sup>, with adhesive applied at 2.40 litre per m<sup>3</sup> (200ml per kg of Bead), the following amount of adhesive should be used per m<sup>2</sup> of InstaBead.

Cavity Width – mm	50	55	60	65	70	75	80	85	90	100	110	125
Coverage – m <sup>2</sup> per m <sup>3</sup>	120	132	144	156	168	180	192	204	216	240	264	300
Litre per m <sup>2</sup>	0.12	0.132	0.144	0.156	0.168	0.180	0.192	0.204	0.216	0.240	0.264	0.30

# Material Deliveries Quality Control

Density example:  
Therefore:

$1000 \text{ litres} = 1 \text{m}^3 = 12 \text{kg/m}^3 (+\text{-} 2 \text{kg/m}^3)$   
 $5 \text{ litres} = 12 \times 5 \div 1000 = 0.06 \text{kg} = 60 \text{ grams}$

Delivery Date	Delivery Batch Number	InstaBead			Adhesive		
		Test Sample			Visual	Film	Bond
		(Litres)	(Grams)	Density			



UK Head Office  
Insta House, Ivanhoe Road  
Hogwood Business Park  
Finchampstead, Wokingham  
Berkshire RG40 4PZ  
United Kingdom



**+44 (0)118 932 8811**



**sales@instagroup.co.uk**



**www.instagroup.co.uk**

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