



Bucknalls Lane, Garston
Watford, Herts WD25 9BA

www.bbacerts.co.uk

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Assessment of Production

Proposed Quality Plan

For

Kingspan Therma Structural Applications – 14/5133
Kingspan Kooltherm Range for Floors, walls and pitched roofs – 14/5134 Ecotherm
Eco range for floors, walls and pitched roofs – 14/5157 (reproduction of 14/5133)
Various Kingspan Insulation & Ecotherm products (See page 2 for Product and
Certificate details)

NB. This PQP document contains comments and amendments (highlighted in yellow) which were made as a result of the inspection carried out on the 03/02/16 by Adrian Edwards MSA.

The document amendments are in need of formal approval and the QP re-signed by the BBA and the client, in preparation for future surveillance inspections.

Document reference	Kingspan All sites AQP January 2016
Date of issue	25 January 2016
BBA Section responsible	Construction Products
BBA Project Manager	Gayetree Ramkorun
Other products covered by BBA Certificates manufactured on this site:	08/4522, 94/3061, 09/4675, 08/4615, 10/4798, 07/4450, 94/2992, 08/4590, 95/3126, 97/3364, 2/4921, 06/4372, 98/3552, 99/3569, 07/4487

List of BBA Certificates and products for each production location: Kingspan Insulation Ltd products

08/4522 - Kooltherm K3
 94/3061 - Kooltherm K7 Sarking Board
 14/5134PS4 - Kooltherm K8 Cavity Board
 09/4675 - Kooltherm K10
 08/4615 - Kooltherm K12
 14/5134PS7 - Kooltherm K15
 10/4798 - Kooltherm K17 & K18
 07/4450 - Kingspan Thermafloor TF70
 94/2992 - Kingspan Thermawall TW50
 14/5133PS3 - Kingspan Thermawall TW52
 08/4590 - Kingspan Thermawall TW55
 95/3126 - Kingspan Thermapitch TP10
 97/3364 - Kingspan TherमारooF TR20 (TR24 / TT44)
 12/4921 - Kingspan TherमारooF TR26 / TT46
 06/4372 - Kingspan TherमारooF TR27 / TT47 (11/4858 - Parafoam Ultra)

Ecotherm Ltd products

14/5157 - Ecotherm Ecoliner – reproduction of TW52
 98/3552 - EcoTherm Eco-Cavity
 07/4487 - EcoTherm PIR Roofing Boards
 99/3569 - EcoTherm Eco-Versal Board

Production location:

Site	Pembridge	Selby	Basildon
Line(s)	Kooltherm Line (Line 1) PIR Line (Line 2) Bonding Line (Line 3)	PIR Line 4	PIR Line (Line 10) Bonding Line (Line 11)
Address	Kingspan Insulation Ltd Pembridge Leominster Herefordshire HR6 9LA	Kingspan Insulation Ltd Sherburn Enterprise Park Enterprise Way Sherburn –in-Elmet North Yorkshire LS25 6NA	EcoTherm Insulation (UK) Ltd Harvey Road Burnt Mills Industrial Estate Basildon Essex SS13 1QJ

Contacts

Specific Site Contacts			
Site	Pembridge	Selby	Basildon
Contact	Samuel Pearce (Quality Engineer)	Steven Buxton (Site Systems Administrator)	Doug Lloyd (Divisional Quality Manager)
Tel:	[REDACTED]	[REDACTED]	[REDACTED]
E-mail:	samuel.pearce@kingspan.com	steven.buxton@kingspan.com	doug.lloyd@kingspan.com

The contacts named above report to:

Doug Lloyd (Divisional Quality Manager)	doug.lloyd@kingspan.com	Tel: [REDACTED]
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(Divisional Quality Manager to be cc'd on all significant written correspondence, e.g. audit reports.)

Is the above production site covered by ISO 9001: 2008 Registration? **Yes**

If YES, Registration No: 388 (Pembridge, Selby)
388 7QMS (Basildon)

Assessed by (organisation): The Loss Prevention Certification Board (LPCB) (Pembridge, Selby)
?

Scope of assessment: Design and Manufacture of insulation and composite insulation materials for the construction industry.

Commented [GR1]: What about Basildon?

Note from Assessor - ISO details was found to be correct.

Last ISO 9001 : 2008 Assessment carried out by LPCB was 14th September 2015 with 1x Minor NC to Report.

Product range:

PIR – Lines 2, 5 & 10

Products comprise a pale yellow rigid PIR core of density > 25.0 kgm⁻³ with plain edges and various facing as detailed in the table below:-

Name	Certificate	Application	Facing	Length (mm)	Width (mm)	Thickness (mm)
Thermafloor TF70	07/4450	Insulation for floors	Trilaminate foil	2400	1200	20 to 200
Thermawall TW50	94/2992	A partial fill cavity wall insulation board	Trilaminate foil	450 600	1200	20 to 200
Thermawall TW52 / Ecoliner	14/5133 PS4	PIR blank for bonding to plasterboard – insulated dry lining	Kraft & foil composite	2400	1200	25 to 150 (insulation)
Thermawall TW55	08/4590	A walling insulation board for use between timber studs or a san insulation sheathing on timber studs	Trilaminate foil	2400	1200	20 to 200
Thermapitch TP10	95/3128	A sarking insulation board for pitched roofs.	Trilaminate foil	2400	1200	20 to 200
Thermarroof TR20 (TR24/TT44)	97/3364	Insulation for flat roofs	Bitumen coated tissue	1200	600	25 to 200
Thermarroof TR26 LPC/FM	12/4921	Insulation for flat roofs	Trilaminate foil	2400	1200	25 to 200
Thermataper TT46 LPC/FM				1200		
Thermarroof TR27 LPC/FM	06/4372	Insulation for flat roofs	Coated glass facing	2400	1200	25 to 200
Thermataper TT47 LPC/FM				600		
EcoTherm Eco-Fix called Inno-Fix	07/4487	Insulation for flat roofs	Trilaminate foil	2400	1200	25 to 200

EcoTherm Eco-Versal	99/3569	Insulation for floors, timber / steel frame walls & pitched roofs	Trilaminate foil	2400	1200	25 to 200
EcoTherm Eco-Bond called Inno-Bond	07/4487	Insulation for flat roofs	Mineral coated glass fibre tissue on both sides	2400	1200	25 to 200
				600		
EcoTherm Eco-Taper	07/4487	Insulation for flat roofs	Can be supplied with any of the facings listed for Ecotherm boards above	1200	1200	25 to 150

Pembridge Bonding Line 3

Name	Certificate	Application	Components	Length (mm)	Width (mm)	Thickness (mm)
Thermawall TW52	14/5133 PS4	An insulating plasterboard laminate	PIR blank	2400	1200	25 to 150
Eco-liner	14/5157		Plasterboard, Type 1			9.5, 12.5
K17	10/4798	A glass-tissue facer phenolic foam for plaster dab bonding	K9 blank bonded to 12.5mm plasterboard and	2400	1200	32.5 to 152.
K18	10/4798	An exposed foil facer for mechanically fixed plaster board	K9 blank bonded to 12.5mm plasterboard and	2400	1200	32.5 to 152.
Thermarroof TR31	TBC	Insulation for flat roofs	Foil-PIR board laminated to 6 - 9 mm plywood / OSB 3	2400	1200	31 to 209
EcoTherm Eco-Deck	07/4487					

Basildon Bonding Line (Line 11)

Name	Certificate	Application	Component s	Length (mm)	Width (mm)	Thicknes s (mm)
Thermawall TW52	14/5133 PS3	An insulating plasterboard laminate	PIR foam blank	2400	1200	25 to 150
Eco-Liner	14/5157 PS3		Plasterboard, Type 1			9.5, 12.5
EcoTherm Eco-Deck	07/4487	Insulation for flat roofs	Foil-PIR board laminated to 6 plywood	2400	1200	31 to 209

Phenolic (Line 1)

Medium to high density phenolic foam core faced with tissue or foam

Name	Certificate	Application	Component s	Length (mm)	Width (mm)	Thickness (mm)
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Kooltherm K3 Floorboard	08/4522	Glass-tissue faced floor insulation	Atlas lightweight coated glass fibre facings	2400	1200	20 to 140
K7	94/3061	A foil-faced phenolic foam core sarking board	International Converters composite foil facing on both sides >85mm Lamtec reinforced foil facing on both sides.	600 2400	1200 1200	20 to 140
K8	94/3047	A foil-faced phenolic foam core board for cavity wall insulation	International Converters composite foil facing on both sides >85mm Lamtec reinforced foil facing on both sides.	1200	450	20 to 140
Kooltherm	09/4675	Tissue / foil faced soffit insulation	Lamtec reinforced foil facing on one side and Appledorn glass-tissue to the other	2400	1200	25 to 140
Kooltherm	08/4615	Foil faced timber/steel framing board	International Converters composite foil facing on both sides	2400	1200	20 to 140
Kooltherm	08/4582	Foil faced rain screen cladding insulation	Lamtec reinforced foil facing to both sides.	2400	1200	20 to 140
Kooltherm	08/4615	Foil faced timber/steel framing board	International Converters composite foil facing on both sides	2400	1200	20 to 140
K9 (used in 8)	10/4798	PF blank for bonding to plasterboard – insulated dry lining	PF core with composite foil & clad tissue facings	2400	1200	20 to 140

Commented [GR2]: What does PF mean?

(1) Supplied as component in various external wall insulation systems

Purchasing data & receiving inspection and testing:

All materials are purchased to agreed specifications. For each delivery of bulk chemicals, i.e. Polyol, MDI and blowing agent, a Certificate of Analysis is also provided. Other materials are visually checked and processed in accordance with **IMS pb/sb/ba IMP 202 4 latest version**. If a delivery of any material does not appear to meet the specification set out in the Raw Material Database, then a concession is raised and authorised by the Technical Process Manager.

Commented [GR3]: What is this? Can inspector sign it at the factory?

Incoming product, raw materials and Components	Identification (type, class, grade, specification, etc.)	Original supplier	Acceptance limits
Polyol	Terate 2541V	Invista	Spec No 263 - (No revision status)
	Terate 7541LOV		Spec No 433 - (No revision status)
	PS2412 (Lot 7703370T402)	Stepan (C of A seen)	Spec No 256 - (Issue 9 25/01/1999)
	PS 1812		Spec No 532 - (No revision status)
	PS 3152		Spec No 555 - (No revision status)
	Daltolac R585	Huntsman	Spec No 90 - (No revision status)
	T7541L	Invista	Spec No 433 - (No revision status)
	Desmodur 44V70L	Bayer	Spec No 136 - (14/01/2014)

MDI	M647	Dow Chemicals	Spec No 264 - (No revision status)
	Suprasec 2085	Huntsman	Spec No 109 - (No revision status)
	M70R (D.N.5000829127)	BASF (C of A seen)	Spec No 175 - (10/01/2013)
Blowing Agents	Cyclo/Iso IP85/15 Pentane (P.O. 2608357)	BCC Gases	Spec No 291 - (No revision status)
		Haltermann (C of A seen)	Spec No 292 - (10/01/2014)
	V156	BCC Gases	Spec No 291 - (No revision status)
	Norpar 5T	BCC Gases	Spec No 558 - (No revision status)
	Isopropyl-chloride	Ineos Solvents	Spec No 506 - (No revision status)
	Iso Pentane	BCC	Spec No 507 - (Issue 2 13/01/2014)
Surfactant	Tegostab B8871 (D.N.3001656937)	Evonik (C of A seen)	Ecotherm Spec B1 - (15/10/2013)
	Tegostab B8871	Goldschmidt	Spec No 458 - (15/10/2013)
Catalyst	Toyocat - DT	Tosoh Corp	Spec No 108 - (No revision status)
	Polycat 5 (D.N.8043207448)	Air Products (C of A seen)	Spec No 108 - (22/10/2013)
	Polycat 8	Air Products	Spec No 10 - (No revision status)
	Polycat 41	Air Products	Ecotherm Spec B2 - (No revision status)
	Catalyst LB	Huntsman	Spec No 14 - (Issue 5 23/12/1999)
	Kosmos 75	Evonik	Ecotherm Spec B3 - (No revision status)
	K-Zero 3000 (Lot.15NLVR011)	Momentive (C of A seen)	Spec No 523 - (23/05/2014)
Flame Retardant	TCCP Fire Retardant	ICL Supresta	Ecotherm Spec B4
	TMCP (antiblaze) – V172	Albemarle	Spec No 277 - (Issue 6 15/07/2011)
	Levagard PP (Lot. CH127016)	Lanxess (C of A seen)	
Foil faced PIR products	Triply (TF70/TW55/TP10, TW50, Eco-Versal, Eco- Fix, Eco-Cavity)	International Converter	Spec No 246 - (No revision status)

Facing		Triply (TR26 / TT46) (Top Layer Roll No. 102190) (Bottom Layer Roll No. 102189)		Spec No 255 - (No revision status)
	TR27 / TT47, EcoBond, EcoTorch, Eco Felt	Coated Glass Facing	Atlas Roofing	Spec No 348 - (02/10/2014)
	TR20 (TR24) / EcoMetre / Ecotorch	Bitumen Glass facing V70	Silcart roofing company	Spec No 275 - (Issue 3 06/2012)
		Bituminised felt glass facer	Icopal (ESHA)	Spec No 355 - (No revision status)
		Bituminised glass with polypropylene fleece	Icopal (Eshah)	Spec No 527) - (No revision status)
EcoFelt, EcoMetre	Bitumen coated glass facer	Icopal (Esha)	Ecotherm Spec B5 - (No revision status)	
Foam blanks ⁽¹⁾	PIR blank for TW52	In-house	As specification	
	PF blanks for K17 & K18			
Plasterboard ⁽¹⁾	9.5mm Square edge	British Gypsum, Siniat or Knauf	Spec No 40 :of 1/7/96	
	9.5mm Tapered edge		Spec No 37: of 1/7/96	
	12.5mm Square edge		Spec No 35: of 1/7/96	
	12.5mm Tapered edge		Spec No 33: of 1/7/96	
Adhesive (dry lining) Adhesive	A9368A7511 9677 (Lot No. 3001737317)	Apollo Chemicals SikaMelt	Spec No 474 - (No revision status) Spec No 578 - (No revision status)	
Hot melt glue	PS-X8774	Henkel	Spec No 453 - (No revision status)	
Phenolic resin ⁽¹⁾	J6014	Hexion (who were Borden) Chemicals.	Spec No 386 - (14/10/2013)	
Phenolic resin ⁽²⁾	R330UF-1	Momentive	Spec No 550 - (17/08/2010)	
Calcium Carbonate	CaCO ²	Omya	Spec No 551- (Issue 8 27/02/2009)	

Extruded polystyrene ⁽¹⁾	700-4 Styrofoam H300	DOW	Spec No 539 - (No revision status)
	Glascofoam IV	Poliglas SA	
Thermarroof TR31 / EcoDeck	6mm Plywood	Jiangsu High Hope Arser co. Ltd	Ecotherm Spec B6 - (No revision status)
		Finn Forest	Spec No 226 - (No revision status)
		Falcon Panel Products Ltd	Spec No 240 - (No revision status)
		Premier forest Products Ltd	Spec No 279 - (No revision status)
		DLH Timber UK Ltd	Spec No 280 - (No revision status)
Chipboard ⁽¹⁾	Kite marked Type P5 to BS 7916 : 1998, BS EN 312-1 : 1997 and BS EN 312-5 : 1997	Sonae 18mm T and G	Spec No 406 - (No revision status)
Adhesive (floor laminate) ⁽¹⁾	XP2337	CAS	Spec No 461 - (No revision status)
	A9368	Apollo Chemicals	Spec No 474 - (No revision status)
Acid ⁽³⁾	E398	Cromogena	Spec No 372 - (No revision status)
Acid ⁽³⁾	NAXCAT MOD-35	NEASE CORP	Spec No 524 - (Issue 4 03/11/2011)
Aluminium foil facing ⁽⁵⁾	Lamtec Reinforced Foil Facer	Lamtec	Spec No 466 - (12/11/2013)
			Spec No 469 - (12/11/2013)
	ICC Foil / Kraft	International Converters	Spec No 465 - (02/12/2013)
Tissue facing ⁽⁵⁾	OCF Glass Veil	Owens Corning	Spec No 349 - (12/11/2013)

(1) The raw materials are checked before offloading as per IMS Pb/Sb/Ba IMP 202

(2) Phenolic resin is delivered and put into bulk tank. Each batch is accompanied by a Certificate of Analysis.

(3) Acid is delivered by bulk tanker and transferred into the acid bulk store. Each delivery the C of A is checked for conformance which is retained on file.

(4) Pentane is delivered in bulk. Deliveries are accompanied by a Certificate of Analysis that are checked for conformance, which is retained on file.

(5) RM codes for the facing materials are held on file and have the basic information in them about the various materials. The specifications for these and all materials are agreed with the suppliers. This is normally done by Head Office with the agreement of the technical and Plant Manager.

Details of incoming bulk raw materials are recorded on internal document on IMS Pb/Sb/Ba IMF 256, And SAP QA12Ps and SAP at Selby.

Details of incoming facings are recorded in SAP

Note from Assessor - Method of receiving Inspection was NOT to be found to be in line with the Quality Plan Requirements.

Commented [GR4]: What about Basildon and Pembridge?

In total 10 highlighted raw materials were sampled during this Assessment.

NC.3. PURCHASING DATA TABLE:

An alternative grade of facing tissue was seen and currently in use for K3 Kooltherm production, but not declared in the latest Quality Plan.

Reference seen; Lightweight CGF supplied by Atlas. - **REMAINS OPEN.**

Product identification and traceability:

Every order that is placed is given a unique SAP Order Number. The Production Programmes for Line 3 and the Line 4 high speed laminator are generated in SAP, then formulated to incorporate all the necessary orders, quoting the respective Order Numbers.

Product identification and traceability: Lines 2, 5 & 10

The Order Number is itself used to identify the boards. The Raw Material Goods Issue Usage Transaction Sheet, SAP Based MIGO Sheet and Works Order Report can be used to identify which consignment of chemicals was used to produce each board.

All blank boards are inkjet printed on one face with the date and time of manufacture. This allows traceability to the production records for that board through the Production Program held in SAP System.
Ref. ZWL_PIR for PIR Boards and ZWL_PHL for Phenolic Boards.

Note from Assessor - Each Board seen on Line 2 TP10 Board is ink Marked and the latest boards seen were Noted as; "100186169 100mm 03/02/2016 RH P".

Note from Assessor - Method of Product identification and traceability were found to be in line with the Quality Plan requirements.

Product identification and traceability: Bonding Lines

All blank boards that are made in house are inkjet printed on the edge with product type, date and time of manufacture. This allows traceability to the production records for that board.

Product identification and traceability: Line 1

A run number is issued to cover production. This is a cumulative number issued by the production department. Each pack is also marked with a relevant pallet number which indicates the time or production. A daily production diary also records the products manufactured under that number.

Method of production and process control:

PIR

Polyol blend

Bulk ingredients (i.e. pure polyols, MDI, pentane TCPP etc.) are pumped from their respective storage tanks to the day tanks on the Lines 2 & 4. These polyols are then metered to the dynamic mixer. On line 10 the same chemical are metred directly to the dynamic mixer from their respective storage tanks.

Lines 2, 5 & 10 high speed laminator

Additives are transferred to designated run tanks (RT) from which the required output is pumped directly into a dynamic mixer where the other additives and blowing agent Pentane and polyols are fed.
The resulting emulsion is fed to the high pressure pumps. The above operation is computer controlled by the Line 2, 5 or 10 computer software.

The polyol blend is injected under high pressure with MDI at the correct output (defined by the SOP) and ratio in accordance with the line speed to produce the specified product.

Note from Assessor - Method of manufacture were found to be in line with the Quality Plan requirements.

Commented [GR5]: To all sites?

Pembridge Bonding Line: Line 3

Plasterboard, chipboard or plywood is lifted with suction pads and placed onto the horizontal conveyor. From the loading station, the board is conveyed into a laydown area where the prescribed amount of single part moisture cured adhesive and hot melt adhesive is applied to the substrate. Insulation panels are manually placed onto the adhesive coated plasterboard/chipboard. These composite boards pass through a mechanical press, at a defined line speed. The boards then enter the pick and place area where they are automatically placed onto a pallet according to the packing sheet.

Basildon Bonding Line: Line 11

Plasterboard, chipboard or plywood is lifted manually and placed onto the horizontal conveyor. From the loading station, the board is conveyed into a laydown area where the prescribed amount of single part moisture cured adhesive and/or hot melt adhesive is applied to the substrate. Insulation panels are manually placed onto the adhesive coated plasterboard/chipboard. These boards are then pressed until the adhesive has cured. The boards are then placed onto a pallet according to the packing sheet.

Lines 1 & 7

Board Production: Before use, phenolic resin is taken from the bulk tank and pumped into the resin day tank. The acid, blowing agent and resin are pumped at a pre-set rate to the mixing head. When a stable flow is achieved the machine goes from recirculation to dispense and foam exits the dispense nozzles onto the base substrate. The top layer of substrate is also supplied from a roller at the rear of the lay down. This layer is applied to form the top of the substrate. The whole of the 'wet end' is controlled by a fully automated system

The board then passes into a fixed gap conveyor contained within an oven between 50 and 75 C (depending on thickness). The partially cured board then passes through a second oven to complete curing.

After packing/wrapping, the stacked boards are placed in temperature controlled curing chambers and left to condition for a minimum period of 48 hours a representative sample is placed with each produced product.

Process Control:

Lines 2, 5 & 10 PIR high speed laminators

Lines 2, 5 & 10 laminator is fully computerised control device which governs speed, output, and formulation (as laid out in the SOP).

The chemicals are injected using high pressure dosing machine. The chemical is laid down using three heads, each having a number of individual streams. The chemicals react and rise with the top facer being introduced on entrance to the conveyor. It is the height of the gap in the conveyor that determines thickness of the resulting board. The additives can be changed on the run by manual control. The continuous board moves at high speed to the trim saws and then the cross cut saws, the boards are then printed with the ink-jet printer. The boards are then stacked and sent down to the band saw to be cut to the desired length.

Each production run has a specific works order number. This number is used on all paperwork for full traceability. The machine operators are given a standard operating procedure to run the machine. The machine operators set the machine conditions and chemical outputs using this information.

A computer record complete with (SAP Based Production Program viewed in QA 33) is given and every 30 minutes checks are carried out to determine dimensions and density. Values are recorded on the computerised record.

The line software will highlight if control inverters are >1% from and will fault out if >2% of the norm on input. A computer print-out of polyol blend (material yield) and line conditions can be raised.

Respective blend recipe (SAP controlled document) is made available for reference. Prescribed ingredient proportions are controlled by weight, and are entered into the line computers by the Laydown Operative.

Note from Assessor - Method of manufacture were found to be in line with the Quality Plan requirements.

Line 1

The production line is set-up in accordance the Line 1 Machine SOP latest issue (SAP controlled) and the relevant Work Instructions detail the initial process settings for the production line which are used as standards for all products. These

Commented [GR6]: Define please

Commented [GR7]: From what?

settings are only varied to optimise production and any changes made are recorded on the process control sheet. Process data is recorded in SAP and the Line 1 Process Sheet (used as a reference by production operatives) for each product and thickness.

Commented [GR8]: How do we control the formulation?

Production Lines controls:

Bonding Line: Lines 3 & 11

The process is fully described in IMS Pb/Sb/Bs IMP 250 Latest Issue.

Commented [GR9]: Define please and inspector to sign. All sites?

Line 1

Board Cutting: The boards ex cure tunnel are cut to the required dimensions by a two-stage operation:

Commented [GR10]: ?

- (1) Side trimming: by use of a hogging cutter in conjunction with a scoring blade. The unit is adjusted manually to achieve the correct width.
- (2) Cut to length: by use of a traversing cross cut saw which moves in relation to the board. control of the unit is via a digital meter which the operator sets to the required length

In-process inspection and testing:

As per IMS Pb/Sb/Ba IMP 250

Results are recorded on form - SAP based PI Sheet viewed through SAP QA33 format.

Property measured	Method used	Frequency	Acceptance limits	Action upon rejection
Density	Line side weigh scale	Every 30 minutes	33-44 kgm ⁻² (Line 3) 25-33 kgm ⁻² (Lines 2 and 4)	Inform Team Leader
Width	Steel Tape (Class II)		As detailed in relevant SAP based PI Sheet within each Master Recipe / IMS Pb/Sb/Ba IMP 253	
Length				
Squareness				
Thickness	Vernier			
Visual Quality	Visual inspection	100% but recorded every 30 minutes.		

Commented [GR11]: Need signing please by inspector

Machines cut lengths and widths slightly bigger than required to allow for shrinkage during curing.

Laminated Board Inspection and testing online.

Note from Assessor - This was found to be correct and within all specifications for today's production.

All boards are cut by an automatic saw and are simply monitored. The thickness is adjusted by a mixture of the flow rates and the line speed. The rise height is partially limited by the height of the top belt of the line. Checks on the end of the line are instantaneous. The cut boards are measured with a tape measure for length & widths and a vernier calliper for thickness, and if results are outside of the warning limits, wet end operators are informed immediately.

Bonding Line – Lines 3 & 11

Property measured	Method used	Frequency	Acceptance limits ±	Action on rejection
Adhesive coating Weight	Line side weigh scale	At start up and hourly	50-80gsm (nominal for TW52, K17 & K18) 60-80gsm (nominal for TF73)	Inform Team Leader
Width	Steel tape (Class II)	Every 30 minutes	600 ± 3 mm 1200 ± 3mm	
Length			2400 ± 5mm	
Alignment	Visual inspection	Continuous	Visual	
Interlaminare Strength	EN 13950 section 5.5 – Adhesion / cohesion test	1 per week	≥17 kPa (as per EN 13950)	

Acceptance limits are also specified in [IMS Pb/Sb/Ba IMF 253](#) and SAP based In Line Inspection & QC Lab based Quality Plans.

Commented [GR12]: More?

In-process inspection and testing:

Line 2 5 & 10

The methods of test are described in [IMS Pb/Sb/Ba IMP 204](#). Test results are entered onto the computer database. Samples from each blend are taken and tested usually off line for the following tests.

Commented [GR13]: Issue? For all sites?

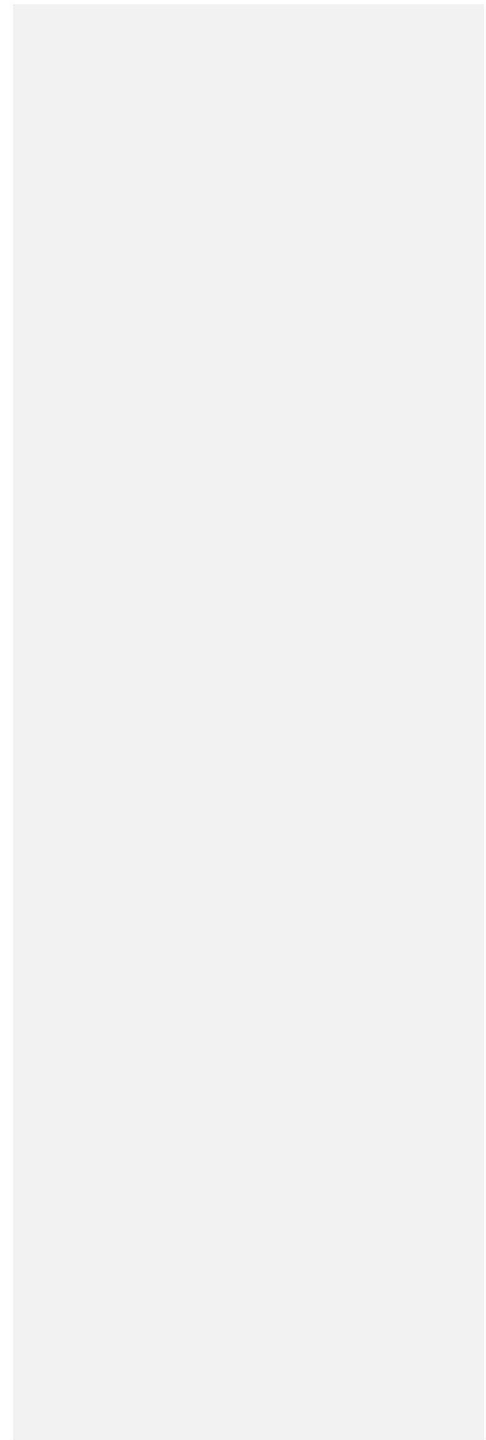
Property measured	Method used	Frequency (minimum)	Acceptance limits	Action upon out of spec
Compressive Strength	Tinius-Olsen / Hounsfield / Zwick compressive machine	Line 2 and 5 – once per thickness or once every 2 hours, whichever is sooner (VARIES BY SITE – FOR ADDITIONAL TESTING REFER TO IMS Pb/Ba/Sb/C b 253 IMF)	>140kPa (TP10, TW50, TW55, TF70, Eco-Versal, Eco-Cavity Wall Board) >150kPa (all others PIR products)	Either reject or concess
Dimensional Stability	Humidity chamber		< 1.5% for 24 hr @ 70 °C 95% RH	
	Freezer		Visually acceptable	
Thermal Conductivity	FOX 314 or FOX 600 (Selby site)		Initial k-value:- Gas tight faced PIR: < 0.0210, with monthly mean value less than	
10 °C mean temp (before ageing)	Calculated	0.0190 W/mK.	Non-Gas tight faced PIR: <0.0218 W/mK	

Commented [GR16]: Need to put the unit, keeps disappearing!

Commented [GR14]: Not clear

Commented [GR15]: Is this frequency correct?

$\lambda_{90/90}$ * (EN 13165) @ 10°C mean temperature *: (90/90 calculation needs to be checked every three months)			Declared k-value:- Gas tight PIR: $\lambda_{90/90} < 0.022$ Non-Gas tight faced PIR: For t < 80 mm: $\lambda_{90/90} < 0.026$ For 80 mm < t < 120 mm: $\lambda_{90/90} < 0.025$ For t > 120 mm: $\lambda_{90/90} < 0.024$	
Water Submersion test ⁽¹⁾	Water bath	Once per run	No delamination of foil based boards	Reject



1) All foil faced products
 ** As per existing Certificates

Gas tight faced PIR = TF70/TW55/TP10, TW50, TR26, TT46, Eco-Versal, Eco-Cavity Wall board, Eco-Fix, Eco-Liner blank

Non-Gas tight faced PIR = TW53, TR20, TR21, TR27, TT47, Eco-bond, Eco-Metre, Eco-Torch, Eco-Felt
 Further tests are carried out on an infrequent basis such as freezer stability, bitumen stability.
 Line 1

Commented [GR17]: Inspector should not be having to check another document, please define?

Property measured	Works procedure	Frequency (minimum)	Acceptance limits	Action upon rejection
Thermal conductivity Taken from the production line. Calculated λ_D^* (EN 13166) @ 10°C mean temperature	SAP Based	One per production run	K3, K5 EWB, K7, K8, K10, K12, K15, K17 & K18 (i.e. K9 blank). Max 0.0195 Wm ⁻¹ K ⁻¹ (before ageing) Declared k-value t ≤ 25mm: $\lambda_D < 0.023$ 25 < t < 45 mm: $\lambda_D < 0.021$ T 45 mm : $\lambda_D < 0.020$	Board rejected
Compressive strength			K3 & K5 EWB 120 kPa K7 125 kPa K8, K9, K10, K12, & K15 100 kPa	

For example:

For the determination of compressive strength of K7, the following arrangements currently apply:

Samples are taken directly from the production line at a frequency of 1 per batch of material made (or works order).

Commented [GR18]: Is this necessary?

Note from Assessor -

On review of the test data it was found that on the whole the testing has been carried out as described with a good level of compliance being achieved.

Stock noted in the warehouse were checked:

1. Thermawall TW50 - 2400 x 1200 x 100mm, Production batch 184386. Production dated 19/01/16.
2. Thermapitch TP10 - 2400 x 1200 x 70mm, Production batch 184931. Production dated 20/01/16.
3. Thermapitch TR26 - 2400 x 1200 x 80mm, Production batch 184385. Production dated 18/01/16.
4. Thermapitch TR27 - 1200 x 600 x 120mm, Production batch 185315. Production dated 27/01/16.
5. Ecobond Innobond - 600 x 1200 x 130mm, Production batch 185172. Production dated 21/01/16.
6. Kooltherm K7 - 2400 x 1200 x 75mm, Production batch 182349. Production dated 18/12/15.
7. Kooltherm K10 - 2400 x 1200 x 75mm, Production batch 184528. Production dated 15/01/16.
8. Kooltherm K15 - 2400 x 1200 x 90mm, Production batch 181565. Production dated 10/12/15.

All QC Results seen were noted as all within all nominated specifications and where applicable Lambda K values.

Calibration:

Calibration procedures are described in [IMS Pb/Sb/Ba IMP 206](#)

Commented [GR19]: More?

Note from Assessor - Test equipment checked

Equipment	Identification	Calibration date / Due date
QC Line No.2 - 300mm VC.	Serial No V042 Ext. Cert. 167546	Last 30/03/15 Next due 03/17 - 24 Mths
QC Line No.2 - Table Scales	Serial No. "4Y" - Ext. Cert. 7001	Last 13/05/15 Next due 05/16 - 12 Mths
QC Line No.2 - Height Stand	Serial No. H004 - Ext. Cert. 227681	Last 30/06/15 Next due 06/17 - 24 Mths
Board Cutting Line 300mm VC.	Serial No V044 Ext. Cert. 167559	Last 30/03/15 Next due 03/17 - 24 Mths

Packaging:

Boards are automatically stacked and polythene shrink-wrapped. Each pack bears a label showing relevant information regarding product description and traceability; including works order number, and bearing the appropriate BBA identification mark (where applicable). Phenolic boards packed with corner protectors.

Bonding Line: Lines 3 & 11

Commented [GR20]: All sites?

Number of laminates per stack is in accordance with SAP data material master / warehouse management tab 2 each palletised stack employs cardboard corner protectors, polythene shrink wrapping and a label which bears manufacturers name, dimensions and date of manufacture.

Line 1 & 7

SAP based PI Sheet within each Master Recipe

Commented [GR21]: All sites?

Note from Assessor - Method of Packaging were found to be in line with the Quality Plan requirements.

Labelling:

Packs are labelled with a product identification label showing the following information:

- Thickness of product
- Product name
- Board dimensions
- No of boards per pack
- Batch No
- Production date ⁽¹⁾

⁽¹⁾ Lamination date where applicable

Note from Assessor - Method of labelling were found to be in line with the Quality Plan requirements.

Use of the BBA symbol:

On marketing literature and labels.

Note from Assessor - Method of using the BBA Logo were found to be in line with the Quality Plan requirements.

Training:

Training procedures are described in IMS GIMP 003 - Training and Competence

Commented [GR22]: More? Needs signing by inspector please

Note from Assessor -

Training records for QC and production personnel was seen to be satisfactory, with training covering job roles.

Samples records seen for the following Staff:

1. Mr. Brian Clee - Line 2 Laydown Process Production Operative.
2. Mr. Frank Billingham - Line 2 Line End Process Production Operative.
3. Mr. David Christopher - Line 2 Production QC Operative.

Complaints:

Complaints procedures are described in IMS Pb IMP 207

Commented [GR23]: Issue?

Note from Assessor -

It was reported that the company had received 20 complaints approx. Main reasons for commercial issues.

4x product related and justified complaints since the last assessment.

The complaints system in place is considered to be satisfactory.

Quality policy: We undertake to have the product produced and placed on the market as described above. We will advise the BBA of any changes and receive agreement from the BBA before the changes are implemented.

Signed.....Dated.....

Title.....

End of Quality Plan

For BBA internal use only		
BBA Cert(s)	Approved by:	Date:

Appendix – Document Revisions

Revision No	Reason for re-issue	Date