Insulated Panels
Standing Seam Systems

KingZip SF
Standing Seam

KingZip SF Accessories

Technical Data Sheet

Kingspan®

KingZip Ridge Closure

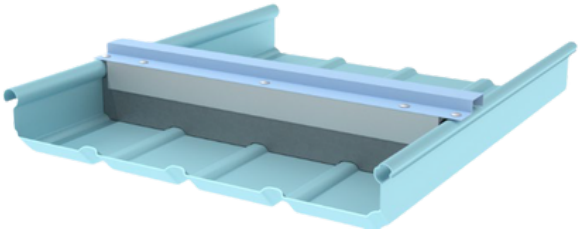
Product Category: Kingspan General Accessories

DCN: KIP-TDS-AAC-002

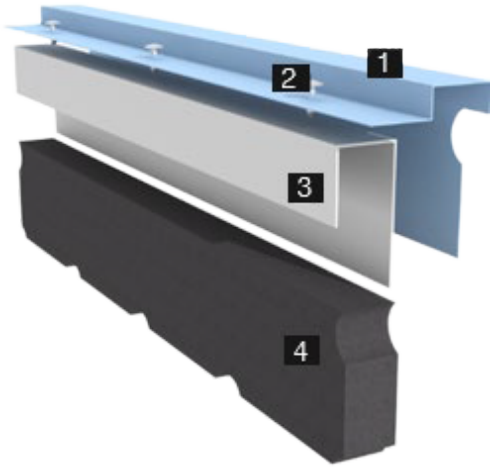
One of the three parts of ridge closure components designed to be fixed into the ridge filler shroud. This is used as a first line of defense against water ingress due to the combined cyclic wind pressure and rain.

The ridge closure is a standard component for the KingZip Standing Seam System. It is riveted to the ribs of the KingZip profiled sheets and serves as a fixing element for ridge flashings and acts as to protect the ridge filler against dynamic wind along with the rain than may displace the ridge filler causing water ingress.

Product Specification	
Material	Aluminium [standard]
Alloy	EN-AW3105 or EN-AW 3004
Thickness	0.80mm TO 1.20mm
Dimensions	To suit KingZip Profile
Finish	Mill finish or coated upon request
Tolerances	+/- 2.00mm



Note that the KingZip Ridge Closures can be produced in other materials such as galvanized steel or stainless steel or to suit the KingZip metal sheet.



1 KingZip Ridge Closure

2 Closed-end rivets

3 KingZip Filler Shroud

4 Foam Filler

Chemical Composition in %													
Alloy Designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others		Aluminum (min)
Numerical	Symbols										Each	Total	
AA3004	AlMn1Mg1	0.30	0.7	0.25	1.01 1.50	0.8 1.3	-	-	0.25	-	0.05	0.15	Remaining
AA3105	AlMn0.5Mg0.5	0.60	0.7	0.30	0.30 0.80	0.20 0.80	0.20	-	0.40	0.10	0.05	0.15	Remaining

Designated Standards	
BS EN 485-2	Aluminum and aluminum alloys. This European Standard Specifies the mechanical properties of wrought aluminum and wrought aluminum alloy sheet, strip and plate for general engineering applications.
BS EN 1396	Aluminum and aluminum alloys wrought products and temper designation. This European Standard Specifies the mechanical properties of wrought aluminum and wrought aluminum alloys in the form of coil coated sheet and strip for general applications.

Material Warranty

The material warranty is determined by geographical location, local environment, paint system and color. For further information please contact Kingspan Technical Department.

Quality Assurance

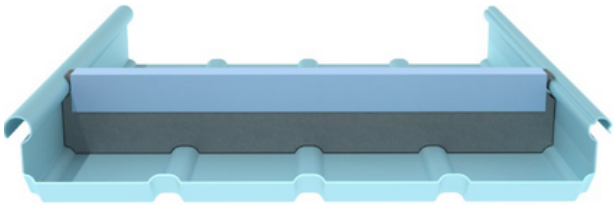
Kingspan Quality Assurance Plan (QAP) states all the inspection hold points in Kingspan's production process that the Quality Controllers follow to ensure that 100% inspection is achieved. This is how Kingspan ensure the finished products are of the highest standard possible. Kingspan QAP can be adapted to suit your project requirements if needed.

KingZip Ridge Filler Shroud

Product Category: Kingspan General Accessories

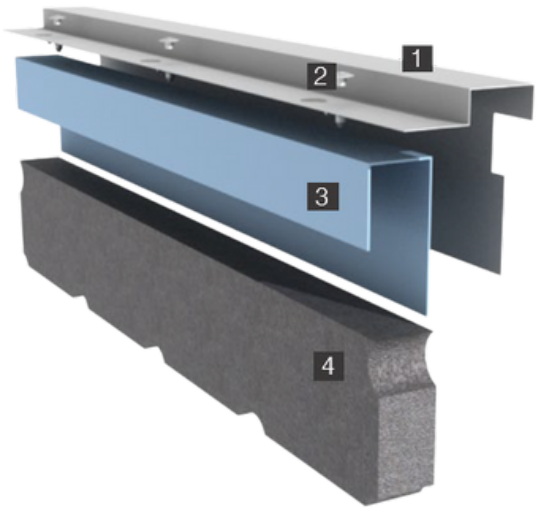
DCN: KIP-TDS-AAC-003

One of the three parts of ridge closure components designed to hold the ridge foam filler in place. Specifically designed to retain the position of the ridge foam filler during temperature change. It is fixed on the ridge closure for rigidity and keeping the other ridge components stable.



The Ridge Filler Shroud is a standard component for the KingZip Standing Seam System. It is used to fix the ridge closure by closed-end rivets making both components composite. Its main purpose is to reinforce the ridge filler keeping it in place in most cases during temperature change and adverse weather conditions.

Product Specification	
Material	Aluminium [standard]
Alloy	EN-AW3105 or EN-AW 3004
Thickness	0.80mm TO 1.20mm
Dimensions	To suit KingZip Profile
Finish	Mill finish or coated upon request
Tolerances	+/- 3.00mm



1 KingZip Ridge Closure
2 Closed-end rivets
3 KingZip Filler Shroud
4 Foam Filler

Chemical Composition in %													
Alloy Designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Others		Aluminum (min)
Numerical	Symbols										Each	Total	
AA3004	AlMn1Mg1	0.30	0.7	0.25	1.01 1.50	0.8 1.3	-	-	0.25	-	0.05	0.15	Remaining
AA3105	AlMn0.5Mg0.5	0.60	0.7	0.30	0.30 0.80	0.20 0.80	0.20	-	0.40	0.10	0.05	0.15	Remaining

Designated Standards	
BS EN 485-2	Aluminum and aluminum alloys. This European Standard specifies the mechanical properties of wrought aluminum alloy sheet, strip and plate for general engineering applications.
BS EN 1396	Aluminum and aluminum alloys. This European Standard specifies the particular requirement for wrought aluminum and wrought aluminum alloys in the form of coil coated sheet and strip for general applications.

Material Warranty

The material warranty is determined by geographical location, local environment, paint system and color. For further information please contact Kingspan Technical Department.

Quality Assurance

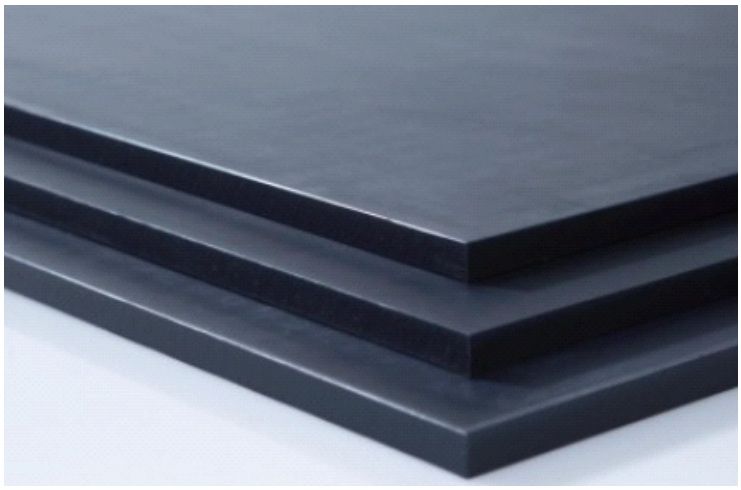
Kingspan Quality Assurance Plan (QAP) states all the inspection hold points in Kingspan's production process that the Quality Controllers follow to ensure that 100% inspection is achieved. This is how Kingspan ensure the finished products are of the highest standard possible. Kingspan QAP can be adapted to suit your project requirements if needed.

Thermal Barrier Pad

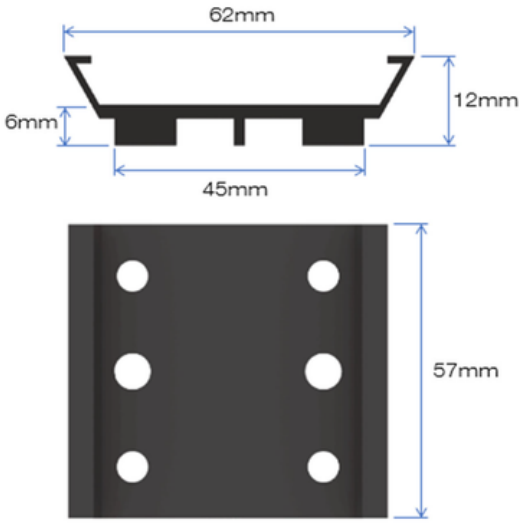
Product Category: Kingspan General Accessories

DCN: KIP-TDS-AAC-004

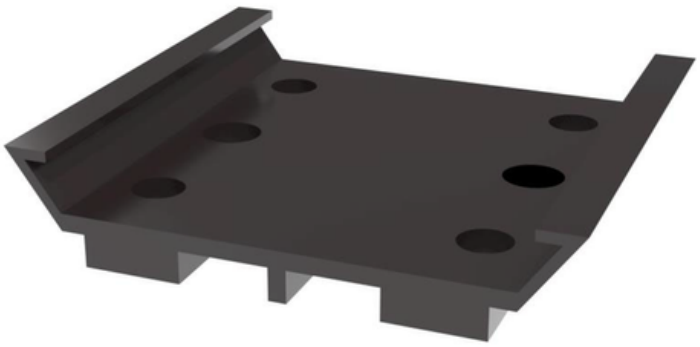
Kingspan extruded aluminum halters are supplied with pre-fitted thermal barrier pads. Apart from being a separator for dissimilar materials, the thermal barrier pads are used to enhance thermal performance, mitigating the thermal bridging through the KingZip system assembly.



This Technical Data Sheet explains the relation of the Kingspan halter and thermal barrier pad to thermal bridging effects. Most of the local and International Building Regulations require every external building element to comply with thermal standards and that the full thermal bridging effect of a building fabric element be considered when calculating its U-value. The benefit achieved from the thermal barrier pads can be derived from hot-box testing dependent on the frequency of halters per m^2 penetrating the insulation layer.



Standard View



Isometric View

Product Specification		
Base material	Modified Rigid PVC	Chemical Resistance Resistant to solutions of inorganic acids, alkalis, and salts. Not affected by many organic chemicals except ketones and certain aromatic compounds.
Density in g/cm^3	1.43 + 0.03	
Tensile strength in N/mm^2	50 ± 5%	
Elongation at break in %	120 ± 5%	
Coefficient of linear expansion	0.00005 per C	Fire Characteristics Self-extinguishing
Continuous operating temperature in C	-5 to +70	Non flame propagating
Shore D hardness	82	Meets V0 criteria according to UL94
Vicat softening temperature in C	81+ 2	Limiting oxygen index (LOI) value is more than 45%

Thermal transmittance or also known as U-Value is a measure of heat loss in a building element and can be referred to as an overall heat transfer coefficient and measures how well parts of a building transfer heat. U-Values are important because they form the basis of any energy or carbon reduction standard.

The U-Value can be derived from the procedures in EN-ISO 6946 for the calculation of thermal resistance and U-value of the system including methods for assessing thermal bridging of light steel-frame constructions. This method has been validated using the procedures in EN ISO 10211-1 and enables U-values to be calculated by means of a simplified method.

Condensation risk assessment on the other hand, is applied where moisture can form within a building's element at the dew point location. This is technically termed as interstitial condensation. This condensation related issue can result in reduced insulation performance of a building element, failure, or the degrading of building materials over time and internal dampness related issues. Mitigating against this type of condensation will involve assessment which for best effect, should be undertake in conjunction with preparation of U-Value calculations at the design stage. Retrospective correction is often very invasive and carries significant cost implications.

Condensation risk and U-value reduction is mainly caused by thermal bridges that occur where the envelope is penetrated by a material with a relatively high thermal conductivity and at interfaces between building elements where there is a discontinuity in the insulation.

Thermal bridges result in local heat losses, consequently more energy is required to maintain the internal temperature of the building and lower internal surface temperatures can be found around the thermal bridge. Cold surface temperatures can cause condensation which may lead to mold growth. Calculations can be done according to EN ISO 13788 used as a guide in predicting interstitial condensation.

Both U-Value and condensation risk assessment can be simulated using the Solidworks simulation software. Examples of isothermal simulation and heat flow is shown in Fig-01 and Fig-02 below. Please contact Kingspan Technical Department to request for isothermal simulations on project specific build-up.

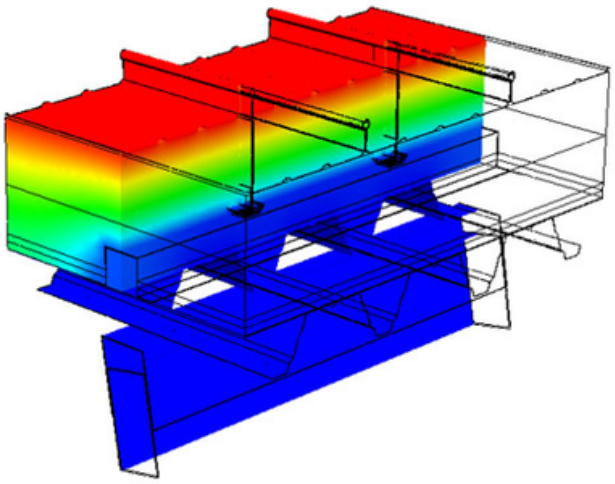


Fig.01- Heat flow downwards

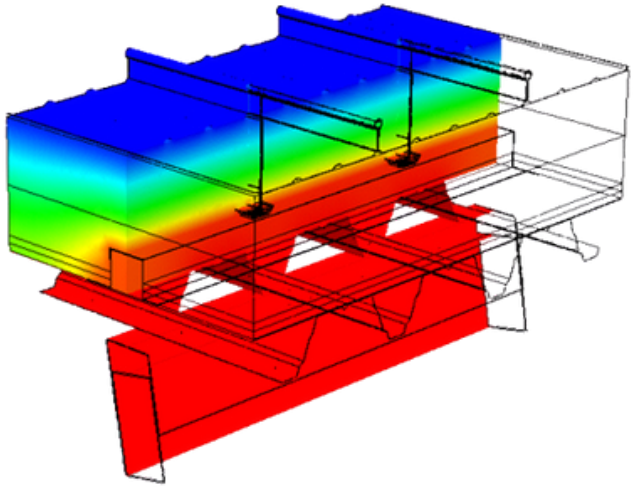


Fig.02- Heat flow upwards

The thermal bridging effect that the halters with thermal barrier pad have on the U-value of a KingZip standing seam system is dependent upon the frequency of halters that penetrate the insulation layer. *In case of inclusion of top-hat or omega profiles to increase the depth of the insulation, consider adding insulation infill into the top-hat spacers to avoid further thermal bridging effects and control the risk of interstitial condensation.* The U-value tables below cover various range of support from centers 1.00m to 2.60m with varying thicknesses of mineral fiber insulation with various thermal conductivities.

NOTE: The recommended U-values are in line with England and Wales Approved Document L1A 2010 where U_{max} = 0.20 W/m^{2}K. This is to be used for reference only as the KingZip sheet length and halter layouts can affect the values. The tables are just indication of the thermal bridge ranges on various insulation k-values and thicknesses. Please contact Kingspan Technical Department for a specific U-value calculation and assessment.

Table 1- 01

KingZip Linea 300- Halters with Thermal Barrier Pads
U- Values in W/m^{2}K

K-value	Halter	Top hat (mm)	Insulation (mm)	Unbridged U-value	Halter spacings (m)								
					1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
0.040	245	44	230	0.170	0.248	0.235	0.227	0.221	0.220	0.213	0.210	0.208	0.204
0.037	245	34	220	0.164	0.234	0.223	0.215	0.210	0.205	0.203	0.201	0.198	0.195
0.035	245	24	210	0.163	0.218	0.209	0.202	0.198	0.193	0.191	0.189	0.187	0.185
	225	34	200	0.171	0.226	0.217	0.210	0.205	0.201	0.199	0.197	0.195	0.193
0.032	245	-	186	0.168	0.217	0.208	0.202	0.198	0.194	0.192	0.190	0.189	0.187
	215	24	180	0.173	0.223	0.215	0.208	0.204	0.200	0.198	0.197	0.195	0.193
	205	24	170	0.183	0.223	0.215	0.208	0.204	0.200	0.198	0.197	0.195	0.193

Table 1- 02

KingZip Linea 400- Halters with Thermal Barrier Pads
U- Values in W/m²K

K-value	Halter	Top hat (mm)	Insulation (mm)	Unbridged U-value	Halter spacings (m)								
					1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
0.040	245	44	230	0.170	0.232	0.223	0.217	0.212	0.207	0.205	0.202	0.199	0.196
0.037	245	34	220	0.164	0.220	0.212	0.206	0.202	0.198	0.195	0.193	0.191	0.188
0.035	245	24	210	0.163	0.209	0.201	0.196	0.192	0.189	0.187	0.185	0.183	0.181
	225	34	200	0.171	0.216	0.208	0.203	0.199	0.196	0.194	0.192	0.191	0.189
0.032	245	-	186	0.168	0.208	0.201	0.197	0.193	0.190	0.189	0.187	0.186	0.184
	215	24	180	0.173	0.213	0.206	0.201	0.198	0.195	0.194	0.192	0.191	0.189
	205	24	170	0.183	0.223	0.216	0.212	0.208	0.205	0.204	0.202	0.201	0.199

Table 1- 03

KingZip Linea 500- Halters with Thermal Barrier Pads
U- Values in W/m²K

K-value	Halter	Top hat (mm)	Insulation (mm)	Unbridged U-value	Halter spacings (m)								
					1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
0.040	245	44	230	0.170	0.223	0.216	0.210	0.205	0.201	0.198	0.196	0.194	0.192
0.037	245	34	220	0.164	0.212	0.205	0.200	0.196	0.192	0.190	0.188	0.186	0.184
0.035	245	24	210	0.163	0.203	0.197	0.192	0.189	0.186	0.184	0.183	0.181	0.179
	225	34	200	0.171	0.210	0.203	0.199	0.196	0.193	0.191	0.190	0.188	0.187
0.032	245	-	186	0.168	0.201	0.196	0.192	0.189	0.187	0.185	0.184	0.183	0.181
	215	24	180	0.173	0.206	0.201	0.197	0.194	0.192	0.190	0.189	0.188	0.187
	205	24	170	0.183	0.217	0.211	0.207	0.205	0.202	0.201	0.199	0.198	0.197

Tables 1-01 to 1-03 indicate various combinations of KingZip cover widths and halter spacing with the same insulation thickness of specified thermal conductivity or k-value. The U-values significantly due to the frequency of halters and KingZip cover widths. Also, the top-hats or omega spacers will cause linear thermal bridging derived by using two dimensional numerical modelling. As the top hats or omega are positioned low down in the system construction, the thermal bridging effect are only very minimal.

As a summary, the thermal bridging effects can be mitigated by the addition of the thermal pad and insulation infill on various top-hat or omega spacers as shown in the system construction in Fig.03 below.

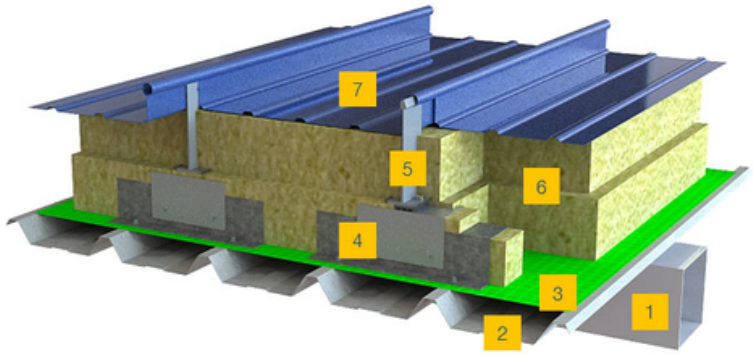


Fig.03- System Build-up

Layers of construction

1	Structural steel support
2	Trapezoidal liner or decking
3	Vapor control layer
4	Top-hat or omega spacers with insulation infill
5	Kingspan halter with thermal barrier pad
6	Mineral wool insulation
7	KingZip standing seam sheet

Contact Details

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For the product offering in other markets please contact your local sales representative or visit www.KingZipSF.com

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