Rennicks stiffening channels & fixing clip conformity to EN 12899-1; 2007

Introduction
This document details the performance of the Rennicks stiffening channels and fixing clips to EN 12899-1; 2007.

Rennicks channels have been structurally analysed and incorporated into SignLoad calculation software v2.1 and above by Buchanan Computing.
The performance of Rennicks aluminium & stainless steel fixing clips is detailed in the following pages.

Similar types of fixing clips and stiffening channels are available from other suppliers and it is inevitable Rennicks clips & channels may be used with other supplier's products. Rennicks has supplied clips and channels for over 15 years without structural problems in use.

The performance of Rennicks channels & clips to EN 12899-1; 2007 is detailed in the following tables and demonstrates;

- Rennicks range of channels and clips performance when used together in a kit.
- Rennicks range of channels correctly accommodates other manufacturer's clips intended to be used in the industry standard channel "neck".
- Rennicks range of clips correctly fit and provides similar performance in other suppliers channel designs with the industry standard channel "neck".

Supporting information
Annex A; Manufacturers Declaration of Performance
Annex B; Examples of industry standard "neck" stiffening channels.
Annex C; Performance for Rennicks aluminium clips.
Annex D; Performance for Rennicks stainless steel clips.

Yours Sincerely

Sean Coffey
Group Technical Manager

Rennicks Group
Ireland Postal Address: Rennicks Group Limited, Unit 1A Damastown Way, Mulhuddart, D15 NNOF
UK Postal Address: Rennicks (UK) Ltd., Stuart Road, Manor Park, Runcorn, Cheshire, WA7 1TS

Annex A; Rennicks Performance Data Sheet

CONSTRUCTION PRODUCTS REGULATION

Performance Data Sheet

Document: RE :054 Rev : EN -B

1. Identification code: Strengthening channels and fixing clips.

2. Serial number: Not applicable

3. Intended use: Strengthening sign plates & attaching fixed vertical road traffic signs to supports.

4. Manufacturer: Rennicks Sign Manufacturing, Kilbride, Mulhuddart, Dublin 15.Ireland.

5. EC Certificate Number: GB 13/88942

6. Authorised representative: Not applicable

7. Assessment and verification of constancy of performance: Attestation System 1

8. Relevant harmonised standard: EN 12899-1:2007.
SGS United Kingdom Ltd., Unit 202b, Worle Parkway, Weston-super-Mare, BS22 6WA. , UK.

9. Certification Body I.D Number: 0120

10. European Technical Assessment: Not applicable

11. Declared performance;

Product	**Used with Fixed vertical traffic signs**
Aluminium channel sections providing support to rear of signs. Attached to substrate by sign manufacturer during sign manufacture.	5.3.1 Wind actions; Verification of performance by calculation using v2.1 (and above) SignLoad software. The wind loading class is provided by the specifier or selected from table NA2 in BS EN 12899-1; 2007 National Annex for the signs location, and its proximity to the coast. We declare the design of the aluminium extrusions supplied by Rennicks (UK) Ltd., are of the same dimensions and alloy type as those included in SignLoad v2.1 (and above) Traffic sign structural calculation model. Conformity of the sign face to the structural requirements of BS EN 12899-1; 2007 is the responsibility of the sign manufacturer who determines certain factors in addition to information required from the specifier which includes; Sign dimensions, basic wind pressure, number of posts and centres / overhang and mounting height. Default performance classes set to the values recommended in the National Annex: 5.4.1 Temporary deflection Table 11 Bending TDB4 (or TDB5 for passively safe posts). 5.4.1 Temporary deflection Table 12 Torsion TDT4 (for signs on a single support) 5.3.2 Dynamic load from snow clearance DSL0 (no snow loading). 5.3.3 Point load PL1 (500 N), 5.4.2 Permanent deflection Pass, 5.2 Partial safety factors PAF1 7.1.2 Colour. Channel painted Aircraft Grey (BS 361C No. 693), Black RAL 9005 or aluminium mill finish. 7.1.7 Surface protection; Painted Channels; Class SP1; Painted coating provided. Aluminium finish channels; Class SP2 Inherent surface protection provided by aluminium
Fixing clips for attaching signs to supports Aluminium Products;	7.1.2 Colour. Aluminium products are finished with dulled self-colour surface. Stainless Steel products are finished with self-colour surface. 7.1.7 Surface protection Class SP2; Inherent surface protection provided in aluminium and stainless steel products.

Channel Clips Banding Clips Uni-clips RSJ Clamps Offset Brackets Butting Clamps <u>Stainless Steel Products;</u> Channel Clips Banding Coils Banding Buckles Buckle Straps	7.1.14 Fixings; Rennicks range of fixing clips is designed to fit the supports to provide resistance to sliding and rotation. The Rennicks range includes aluminium and stainless steel fixing clips. Testing to EN 12899-1; 2007 is detailed in the following tables and demonstrates; • Rennicks range of channels and clips performance when used together. • Rennicks range of channels correctly accommodates other manufacturer's clips intended to be used in the industry standard channel "neck". • Rennicks range of clips correctly fit and provides similar performance in other suppliers channel designs with the industry standard channel "neck". • Rotation of fixing clips around the supporting post cannot occur when a sign is installed on; Two or more posts of any shape. Singular rectangular hollow section post and posts with a flat face. • Maximum horizontal point load of Rennicks channels / clips / M8 square head bolt where a clip could not rotate is PL4; the foot of the clip pulled out of the channel before PL5 was reached. • The maximum wind loading to table 8 for Rennicks range of clips is 1.9kNm2 irrespective of channel design or type.

12. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 11. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Sean Coffey
Group Technical Manager
Date___4th July 2018_____

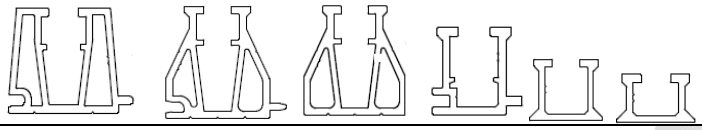
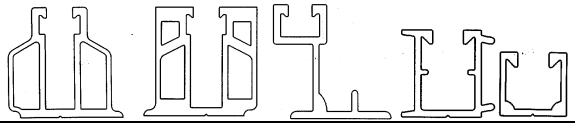
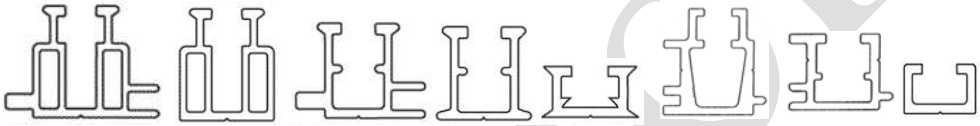
Rennicks Group
Ireland Postal Address: Rennicks Group Limited, Unit 1A Damastown Way, Mulhuddart, D15 NNOF
UK Postal Address: Rennicks (UK) Ltd., Stuart Road, Manor Park, Runcorn, Cheshire, WA7 1TS

Annex B; Examples of industry standard “neck” stiffening channels.

The channel cross sections shown below were included in Rennicks testing. Testing is detailed in annex H
Other channels with similar neck designs are also compatible..

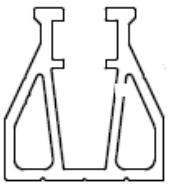
Result of testing by interchanging clips and channels;

- Clip performance in other supplier’s channels; same point load performance as Rennicks channels.
- Using a higher torque in other channels to secure M8 nut results in the same clip resistance to rotation where 19n/m torque is used.

Supplier	Channel cross section – all accommodate M8 square head bolt & standard clip foot.
Rennicks	
Other suppliers channel designs	
	

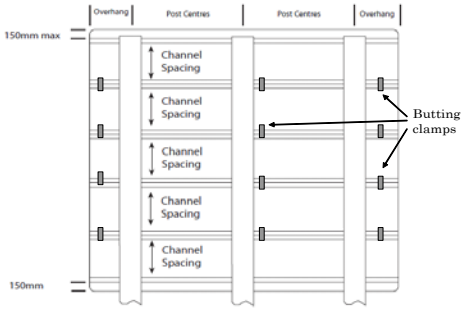
Fitting twist in clip to post and channel.
Slide an M8 stainless steel square bolt head into the standard channel “neck” design, twist the foot of the clip into the channel and offer over the post and bolt thread. The washer and nut are fitted and the M8 nut should be torqued to 19Nm.

Stainless steel 114mm clip fitted around galvanised posts and into Rennicks stiffening channel.



Example of neck of channel designed to accommodate an industry standard M8 square head bolt.

Fitting two piece uni-clip to post and channel.
Slide flat of clip into the channel, use M8 stainless steel square head or hexagonal head bolts, washers and nuts to secure the clip at the side and torque to 25Nm.



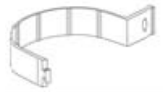
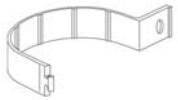
During installation appropriately sized channel clips should be attached at each point a channel, designed to accept a clip, square head bolt, nut and washer,

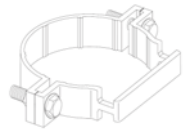
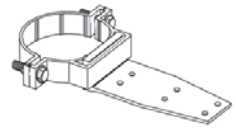
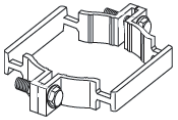
crosses a support. The washer should be placed between the nut and clip and the nut should be firmly tightened to secure the clip to the sign and support.

Universal butting clamps are an integral part of the complete installation and should be fitted during installation across abutting sign sections to clamp together securely. Failure to fit butting clamps may result in sign failure or gaps appearing between sections as a result of post flexing.

Stainless Steel banding is suitable for attaching small signs to irregular support sizes or shapes such as lamp columns. In all other situations the appropriate size clip should be used.

Annex C; Summary of Rennicks aluminium clips minimum performance.

	For sign installed on; • single rectangular hollow section Galvanised or Plastic coated post and similar • two or more circular or rectangular hollow section Galvanised or Plastic coated posts and similar.						
Clip type	Sign shape & size	Number of channels & clips per sign	Torque for nut	Galvanised and painted posts	PVC plastic coated posts	Vertical Point Load kN	View of clip
				Horizontal Point load kN			
All sizes Aluminium Anti-rotational twist-in 1 bolt	All	As SignLoad software	19 n/m	PL4	PL4	PL5	
All sizes Aluminium unclips 2 bolt 76mm	All	As SignLoad software	25 n/m	PL4	PL4	PL5	
Aluminium RSJ clamp	All	As SignLoad software	19 n/m	PL4	PL4	PL5	
	For sign installed on; • single circular hollow section Galvanised or Painted post or similar.						
Clip type	Sign shape & size (mm)	Number of channels & clips per sign	Torque for nut	Galvanised and painted posts	PVC plastic coated posts	Vertical Point Load kN	View of clip
				Horizontal Point load kN			
Aluminium Anti-rotational twist-in 76mm 1 bolt	Circle 300 450 600 750 900 Triangle 600 750	2	19 n/m	PL1	PL2	PL5	
	Circle 1200	3					
	Triangle 900 1200	900 =2, 1200=3		PL0	PL1		
Aluminium Anti-rotational twist-in 89mm 1 bolt	Circle 300 450 600 750 Rectangle 800 x 300	2		PL2	PL2		
	Circle & Triangle 900 1200	900 =2, 1200=3					
Aluminium Anti-rotational twist-in 114mm 1 bolt	Circle 300 450 600 750 900 Triangle 600 750 900 Rectangle 1000 x 300	2		PL2	PL2		
	Circle & Triangle 1200	3					

Aluminium unclips 2 bolt 76mm	Circle 300 450 600 750 900 Triangle 600 750 900 Rectangle 1000 x 1000	2	25 n/m	PL3	PL3	PL5	
	Circle & Triangle 1200	3		PL2	PL2		
Aluminium unclips 2 bolt 89mm and 114mm	Circle 300 450 600 750 900 Triangle 600 750 900	2		PL3	PL3		
	Circle & Triangle 1200	3					
End mounted large or small T section + Ali off set brackets + 76mm, 89mm or 114mm 2 bolt uni clips	Rectangle 600 x 300	2		PL3	PL3		
	Rectangle 700 x 300			PL2	PL2		
	Rectangle 1100 x300			PL1	PL1		
Back to back 2 bolt aluminium clips 76mm, 89mm, 114mm	Circle 300 450 600 750 Triangle 600 750	2	25 n/m	PL2	PL3	PL3	
	Rectangle 1000 x 1000			PL1	PL1		
	Circle 750 900 1200 Triangle 600 750 900 1200	600, 750, 900 =2, 1200=3			PL0		

Annex D; Summary of Rennicks stainless steel clips minimum performance.

For sign installed on; single rectangular hollow section Galvanised or Plastic coated post and similar
two or more circular or rectangular hollow section Galvanised or Plastic coated posts and

Stainless steel clip type	Sign shape & size	Number of channels & clips per sign	Torque for nut	Galvanised and painted post	PVC plastic coated posts	Vertical Point Load kN
				Horizontal Point load kN		
All sizes CHS / RHS 1 bolt & 2 bolt clips	All	As SignLoad software	19 n/m	PL4	PL4	PL5

For sign installed on; single circular hollow section (CHS) Galvanised or Painted post or similar.

Stainless steel CHS clip type	Sign shape & size (mm)	Number of channels	Torque for nut	Galvanised & painted posts	PVC plastic coated posts	Vertical Point Load kN
				Horizontal Point load kN		
1 bolt 50 & 60mm	Circle 300	2		PL0	PL0	
1 bolt 76mm	Circle 300	2	19 n/m	PL1	PL1	
	Circles 450, 600			PL0		
	Circles 750, 900 Triangles up to 900				PL0	
	Circle & Triangle 1200	3				
1 bolt 89mm	Circle 300	2		PL1	PL1	
	Circles 450 to 900 Triangles up to 900	2		PL0	PL1	
	Circle & Triangle 1200	3			PL0	
1 bolt 114mm	Circles up to 750 Triangles up to 750	2		PL1	PL1	PL5
	Circle & Triangle 900, 1200	900 =2, 1200=3		PL0	PL0	
2 bolt 76, 89, 114 mm	Circles up to 900 Triangles up to 600	2		PL1	PL1	
	Circles 1200 Triangles 750, 900, 1200	750, 900 =2, 1200=3		PL0	PL0	
114mm 1 bolt + rubber insert	Circle 1200	3		PL2	PL2	
2 bolt 140, 168, 194, 219, 244, 273mm	Circles up to 1200 Triangles up to 1200	Up to 900 =2, 1200=3		PL1(& FRP posts)	PL1	
2 bolt clips 140 to 273 mm + rubber insert	Circles up to 1200 Triangles up to 1200	Up to 900 =2, 1200=3		PL3 (& FRP posts)	PL3	
Back to back clips	All sizes	n/a		First sign using standard clips, performance as this clip		
S/s banding 13 & 19 mm + Rennicks universal banding bracket or similar	Circle 300 450 600	Up to 900 =2, 1200=3	n/a	PL0	PL1	PL2
	Circle 750 900 1200 Triangle 600 750 900 1200				PL0	