



Recommended Fixings Manual for



Suite of Profiles

SPECIAL NOTES WITH REFERENCE TO DOOR HINGE FASTENERS

Due to the extensive range and specification of door hinge hardware, the recommendations within this manual are intended as a guide only. It is therefore essential that you contact Rapiertstar Technical Department for advice on correct fastener selection for your individual requirements.

The Correct Fastener

rapierstar® the market-leading supplier of screws to the PVC-U window industry, with its unrivalled technical expertise, has worked together with your systems company to produce this recommended fixings manual. The following pages contain advice on the correct fastener for each application.



Your orders are despatched direct from our purpose-built premises near Congleton in Cheshire.

Star Performance

rapierstar® StarPVCU window screws have conformed with all relevant industry standards, guidelines and recommendations for some time and are intended to be used where mechanical resistance, stability and safety of use in the sense of the 'essential requirements' of Annex I of the Construction Products Regulation 305/2011 are to be fulfilled.

Surpassing Standards

rapierstar® branded product ranges have been certified by European approved 'Notified Bodies', confirming initial type testing and assessment & verification of constancy of performance.

BS EN 14351-1:2006+A1:2010, Windows and doors product standard, performance characteristics.

CE **rapierstar®** branded screws conform with the requirements of harmonised European standard BS EN 14351-1 and have been type tested to meet the standard of BS EN 14566:2008+A1:2009. By conforming with this standard, we are describing, with independent verification, that the head/thread/point maintain consistency of design. This also guarantees that the production of steel screws is to EU standards and that factory controls are in place during manufacture.

PAS 24:2012 Windows and doors fabricated with correct StarPVCU screws exceed PAS 24:2012 - enhanced security performance requirements for doorsets and windows in the UK. PAS 24:2012 supersedes PAS 24:2007 and BS 7950:1997, which are withdrawn.

BS EN 1670:2007 Electroplating coatings of **rapierstar®** products comply with the provisions of ISO 2081:2008 and exceed corrosion resistance testing to BS EN 1670 grade 4 for Carbon Steel screws and BS EN 1670 grade 5 for Stainless Steel screws.

ISO 9000, is a family of standards relating to quality management and are designed to help organisations ensure they meet the needs of customers. **rapierstar®** is an ISO 9001:2008 registered company and all our window screws are manufactured by ISO 9000 certificated companies. Full traceability is maintained so long as the screws remain in the box in which they were supplied.

Screw Tips - Best Practice

Perpendicular Insertion: Ensure that any fastener is applied at 90° to the material at all times.

Mechanical Damage: It is important to replace the screwdriver bit regularly. A worn screwdriver bit may not engage fully into the recess, causing damage to the plating of the screw with the resulting likelihood of corrosion.

Torque Setting: The use of excessive torque may lead to stripping and failure of the fastener. The torque setting on the screwdriver should be the minimum required to effect a complete fastening.

Screwdriver Speed: It is recommended by the Glass & Glazing Federation and the British Plastics Federation that driver speeds between 1500 rpm and 2000 rpm are used.

Avoid Corrosive Elements

Several factors can cause screws to rust, each of which can be accelerated depending on the situation of the application.

Silicone sealants - avoid acetic acid cured high and low modulus sealants. The vapour alone is sufficient to cause corrosion. Therefore a neutral curing sealant is recommended.

Acrylic fillers - contact with any carbon steel component will cause corrosion.

Cleaners - aggressive cleaning substances, especially those containing ammonia, chlorine etc. can reduce the effectiveness of the protective plating and should be avoided.

New-build - screws should not come into contact with wet plaster or cement, as the lime content will cause corrosion. Also, the acid wash that is often used to clean brickwork is highly corrosive and should be avoided completely. **Where any of the above conditions are likely to exist, the use of stainless steel is recommended.**

100% Stainless 100% Solution

For coastal or heavily polluted regions of the country, when attaching stainless steel hardware, or where prolonged guarantees are being offered, we recommend that stainless steel screws should be used.

Identification of Stainless Window screws

Unique head design eliminates confusion between the grades of stainless steel used. Clear product marking on the head of **rapierstar**® window screws allows immediate identification of the grade of stainless steel from which the screws are manufactured. This ensures that specifications are adhered to.



Austenitic Stainless Steel - 302

Because 302 grade Austenitic stainless steel is intrinsically soft, it is unsuitable for self-drilling applications. However, it is ideal for use in PVC-U only applications, giving excellent corrosion resistance.



Enhanced Martensitic Stainless Steel - 410

410 grade Martensitic stainless steel is a harder grade which is capable of self-drilling and tapping into steel reinforcement. Screws are independently tested by UKAS accredited test bodies to beyond 3000 hours salt spray test in accordance with BS EN ISO 9227.



Bi-Metallic

Austenitic stainless steel fastener with a carbon steel drill tip. Suitable for reinforced applications. Combination recess with square drive giving effective 'stick-fit' onto the driver bit for ease of insertion during fabrication and common Phillips no2 recess for on-site adjustment. Often accepted by Councils and Housing Associations for use in the manufacture of windows and doors.

In any application where fasteners are required to be guaranteed free from hydrogen embrittlement or any other form of hydrogen induced cracking (HIC), Rapierstar always recommend that fasteners manufactured from a grade of stainless steel considered suitable for the end application be specified and used.

Rapier® StarFix

In choosing **rapierstar**, you have used the industry's leading supplier of window screws to manufacture your windows and doors. To maintain your high standards, have your products installed using the best quality fixings. **StarFix is the most widely used plugless frame fixing available today. Recommend StarFix to your installer.**



Masonry Fixing

- ▶ **No Plug Required**
- ▶ **High Strength Fixing**
- ▶ **50% Quicker Assembly**
- ▶ **30% Less Drive-in Torque Required**

High Tech Fixing

The award winning **StarFix** is probably the most efficient direct masonry fixing available. The patented StarForm thread provides 30% lower drive-in torque and up to 50% quicker assembly. A cost effective and time saving installation with exceptional holding power.







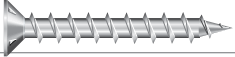

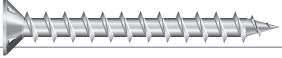
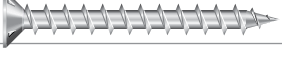












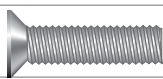
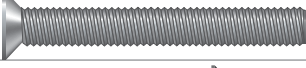


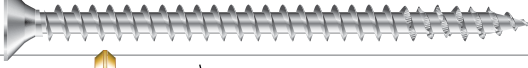

LENGTH (mm)									
62	82	102	112	122	152	152	182	202	




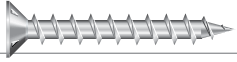
















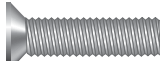



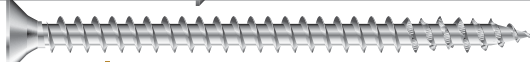

Yellow finish. 7.5mm Diameter.
6.0mm / 6.5mm pilot hole required
8.0mm clearance hole

In tests, **StarFix** has consistently out-performed other lower cost plugless fixings that are often claimed to be it's equal.

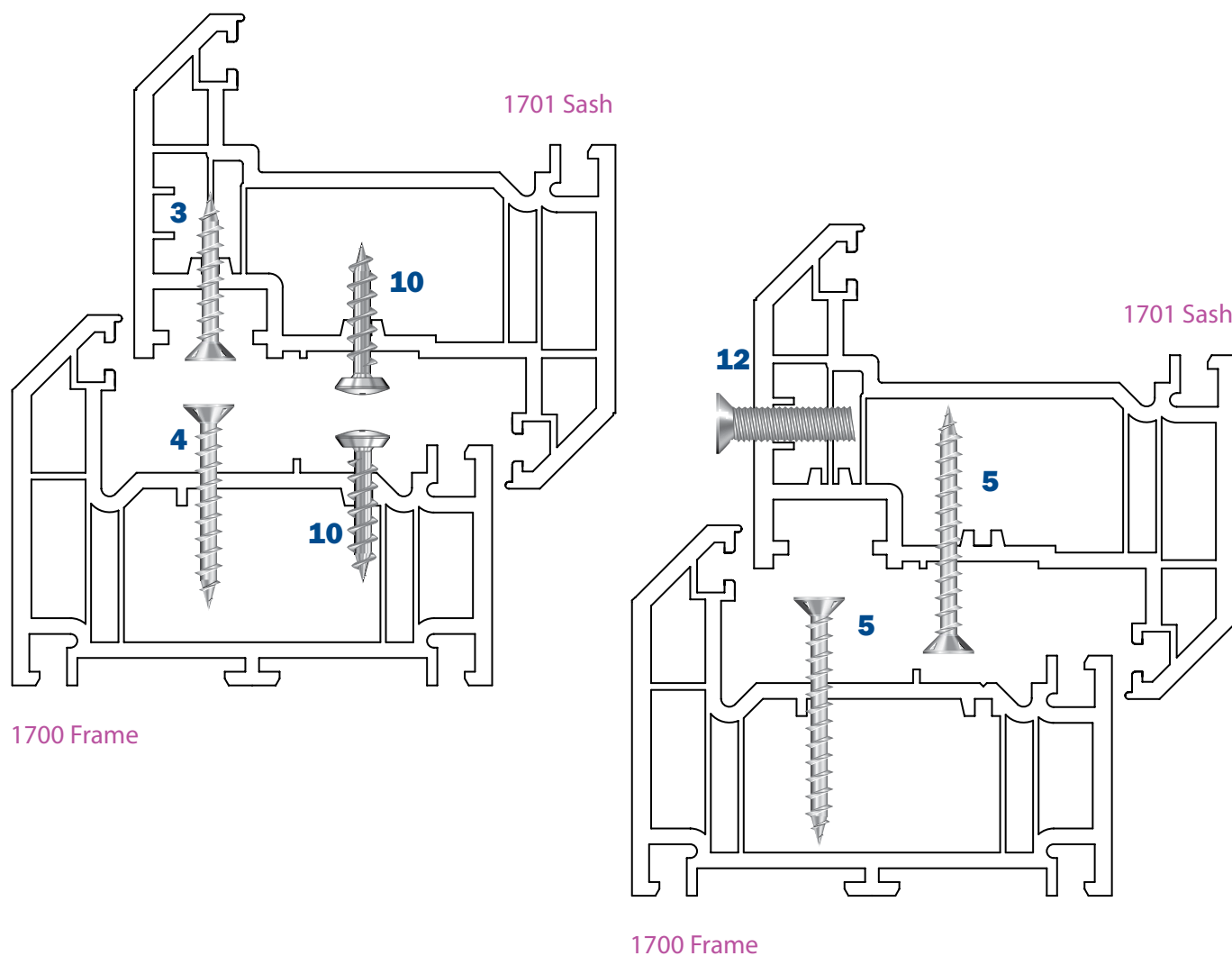
Faster, low torque insertion means battery life of power tools is extended during installation, a valuable cost and time-saving element.

StarFix provides high shear strength and in tests, pull-out values into London Brick, Concrete Block and Engineering Brick have proved exceptional. For details of these test results visit www.rapierstar.com

Carbon Steel		Code	Item	Application
		RSR 3.9 x 16 Z	1	Reinforcement retention
		CFG 4.3 x 16 Z	2	PVCU reinforcement retention
		CFG 4.3 x 25 Z	3	Gearing, Keep
		CFG 4.3 x 30 Z	4	Keep to frame
		CFG 4.3 x 30 Z	4	Butt hinge to sash and frame
		CFG 4.3 x 30 Z	4	Gearing to door sash
		CFG 4.3 x 35 Z	5	Riser block, Pull-in block
		CF 4.3 x 35 Z	5	Dog bolt to sash and frame
		CFG 4.3 x 35 Z	5	Hinge to Tilt/Turn frame
		CFG 4.3 x 35 Z	5	Butt hinge to frame
		CFG 4.3 x 35 Z	5	Letter flap
		CSR 3.9 x 19 Z	6	Keep, Riser block, Pull-in block
		CSR 3.9 x 19 Z	6	Dog bolt to reinforcement
		CSR 3.9 x 25 Z	7	Keep, Riser block, Pull-in block
		CSR 3.9 x 25 Z	7	Dog bolt to reinforcement
		CSR 3.9 x 32 Z	8	Hinge to Tilt/Turn Mullion
		CSR 3.9 x 32 Z	8	Butt hinge to frame
		CSR 4.8 x 38 Z	9	Flag hinge to sash and frame
		SFG 4.3 x 20 Z	10	Friction stay to sash and frame
		SSR 3.9 x 16 Z	11	Friction stay to sash and frame
		MS M5 x 20 Z	12	Casement handle retention
		MS M5 x 40 Z	13	Tilt/Turn handle retention
		CPF 3.5 x 12 Z	14	Flag hinge to sash
		CPF 4.5 x 45 Z	15	Flag hinge to sash and frame
		CPF 4.5 x 70 Z	16	Flying mullion to sash
		MJS 4.8 x 80 Y	17	Mechanical Jointing

Stainless Steel		Code	Item	Application
		RSR 3.9 x 16 S	1	Reinforcement retention
		CFG 4.3 x 16 S	2	PVCU reinforcement retention
		CFG 4.3 x 25 S	3	Gearing, Keep
		CFG 4.3 x 30 S	4	Keep to frame
		CFG 4.3 x 30 S	4	Butt hinge to sash and frame
		CFG 4.3 x 30 S	4	Gearing to door sash
		CFG 4.3 x 35 S	5	Riser block, Pull-in block
		CFG 4.3 x 35 S	5	Dog bolt to sash and frame
		CFG 4.3 x 35 S	5	Hinge to Tilt/Turn frame
		CFG 4.3 x 35 S	5	Butt hinge to frame
		CFG 4.3 x 35 S	5	Letter flap
		CSR 3.9 x 19 S	6	Keep, Riser block, Pull-in block
		CSR 3.9 x 19 S	6	Dog bolt to reinforcement
		CSR 3.9 x 25 S	7	Keep, Riser block, Pull-in block
		CSR 3.9 x 25 S	7	Dog bolt to reinforcement
		CSR 3.9 x 32 S	8	Hinge to Tilt/Turn Mullion
		CSR 3.9 x 32 S	8	Butt hinge to frame
		CSR 4.8 x 38 S	9	Flag hinge to sash and frame
		SFG 4.3 x 20 S	10	Friction stay to sash and frame
		SSR 3.9 x 16 S	11	Friction stay to sash and frame
		MS M5 x 20 Z	12	Casement handle retention
		MS M5 x 40 Z	13	Tilt/Turn handle retention
		CPF 3.5 x 12 Z	14	Flag hinge to sash
		CPF 4.5 x 45 Z	15	Flag hinge to sash and frame
		CPF 4.5 x 70 Z	16	Flying mullion to sash
		MJS 4.8 x 80 Y	17	Mechanical Jointing

Casement Window - Unreinforced


3


9845 CFG 4.3 x 25 Z Gearing to sash

4


9836 CFG 4.3 x 30 Z Keep to frame

10

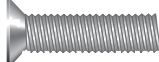

9847 SFG 4.3 x 20 Z Friction stay to frame

10

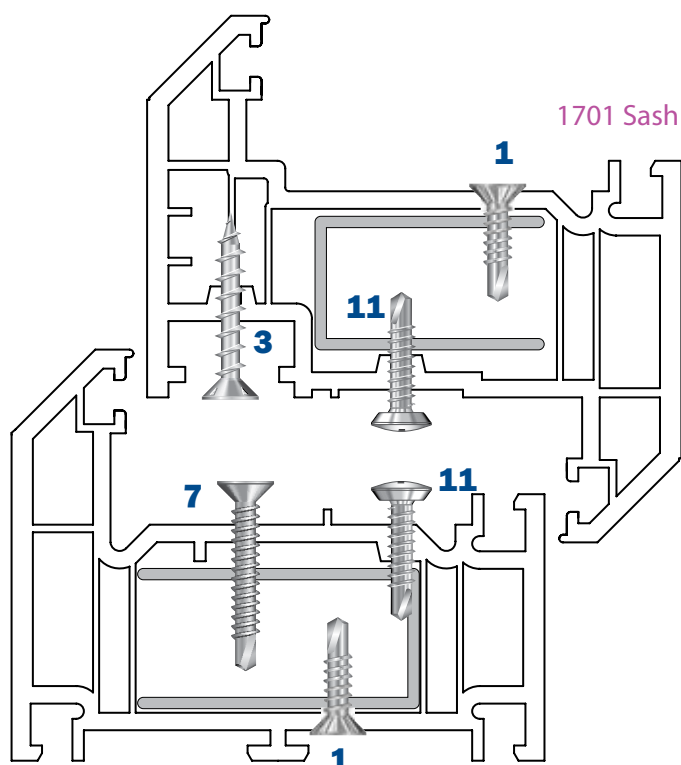

9847 SFG 4.3 x 20 Z Friction stay to sash

5

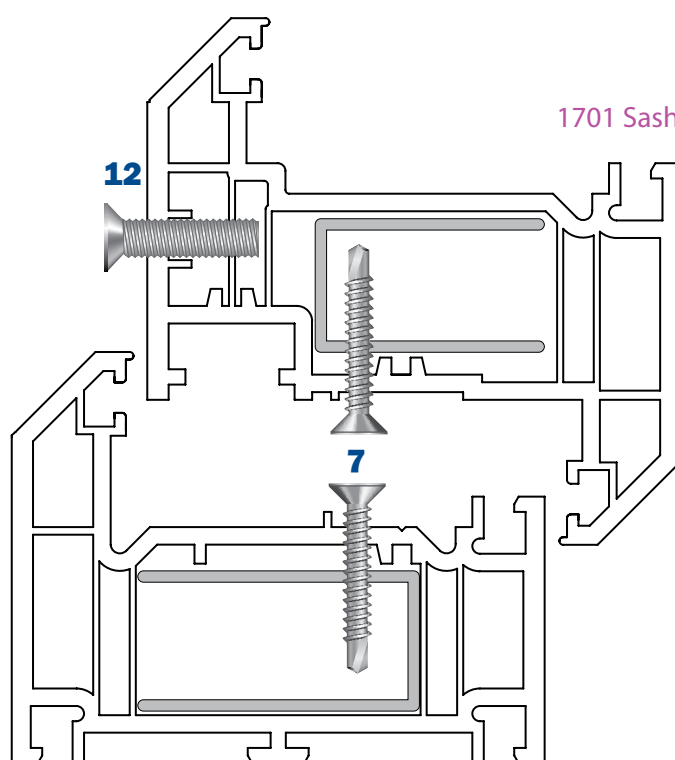

9846 CFG 4.3 x 35 Z Riser block, pull-in block and dog bolt to sash and frame

12


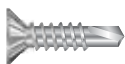
9827 MS M5 x 20 Z Handle to gearbox

Casement Window - Reinforced


1700 Frame



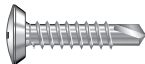
1700 Frame

1


9800 RSR 3.9 x 16 Z Reinforcement retention

11


9812 SSR 3.9 x 16 Z Friction stay to sash

11


9812 SSR 3.9 x 16 Z Friction stay to frame

3

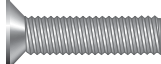

9845 CFG 4.3 x 25 Z Gearing to sash

7


9809 CSR 3.9 x 25 Z Keep to frame

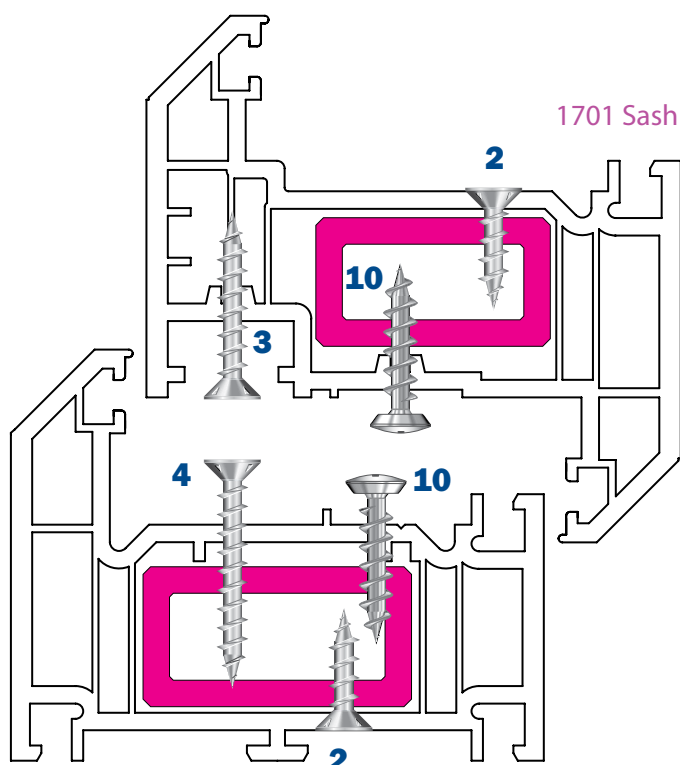
7


9809 CSR 3.9 x 25 Z Riser block, pull-in block and dog bolt to sash and frame

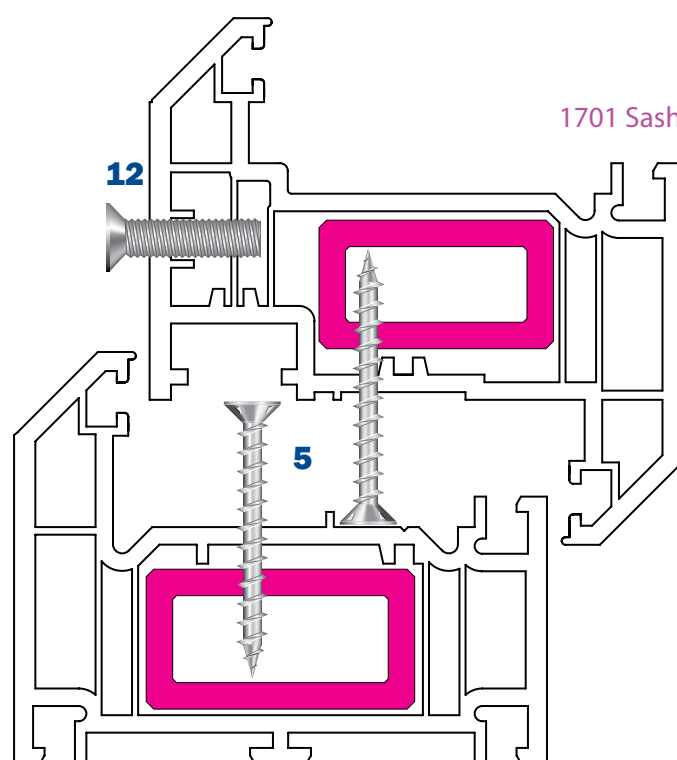
12


9827 MS M5 x 20 Z Handle to gearbox



Casement Window - RTR Bar

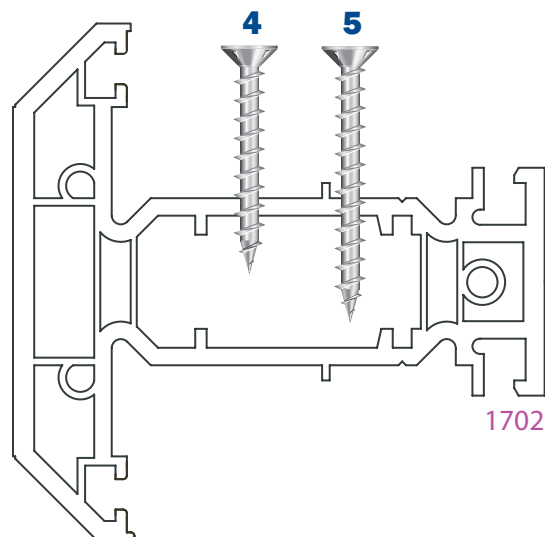
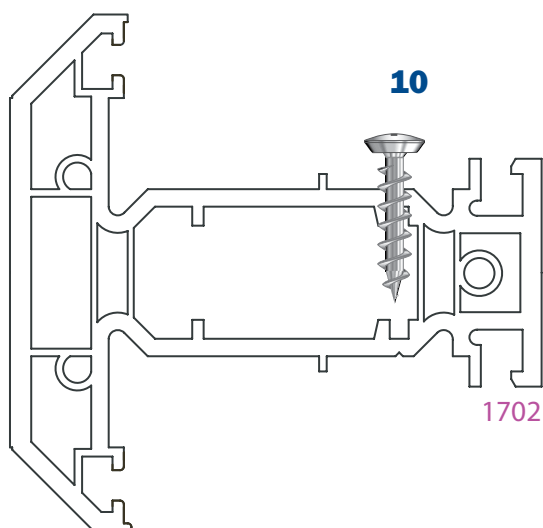
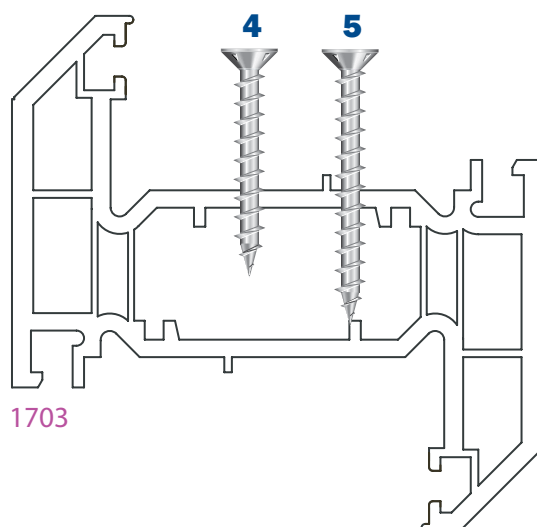
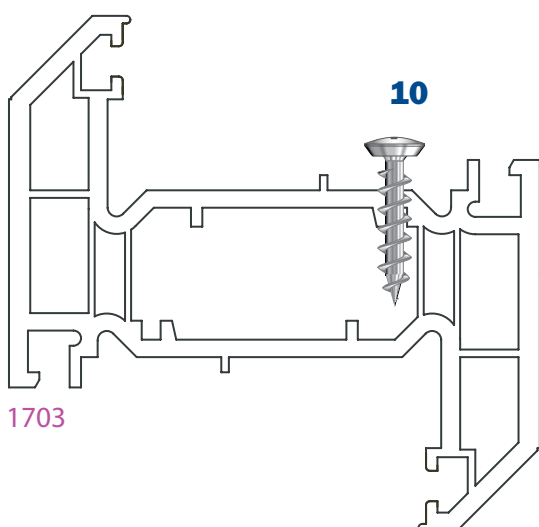


1700 Frame



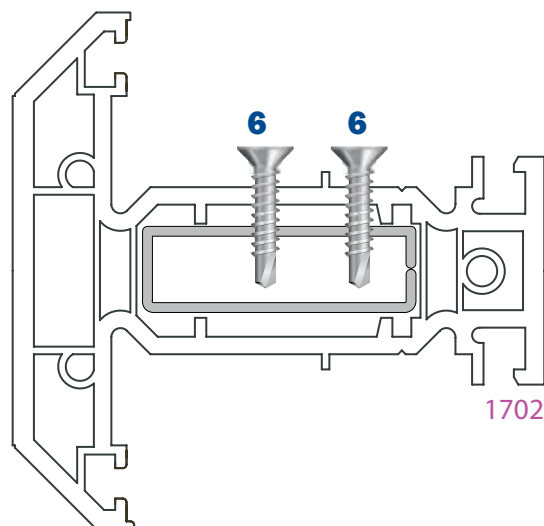
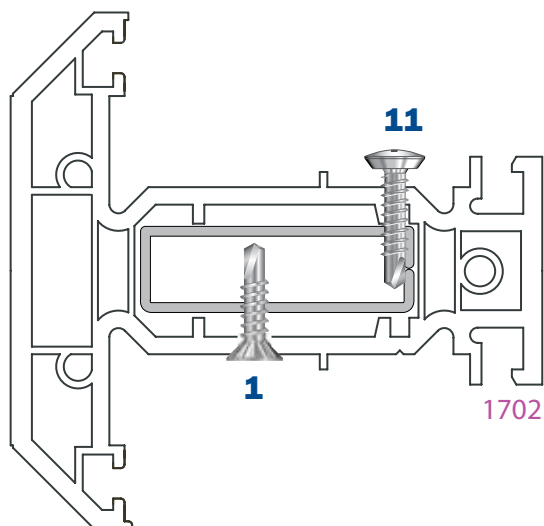
1700 Frame

2		9844	CFG 4.3 x 16 Z	Reinforcement retention
10		9847	SFG 4.3 x 20 Z	Friction stay to sash
10		9847	SFG 4.3 x 20 Z	Friction stay to frame
3		9845	CFG 4.3 x 25 Z	Gearing to sash
4		9836	CFG 4.3 x 30 Z	Keep to frame
5		9846	CFG 4.3 x 35 Z	Riser block, pull-in block and dog bolt to sash and frame
12		9827	MS M5 x 20	Handle to gearbox

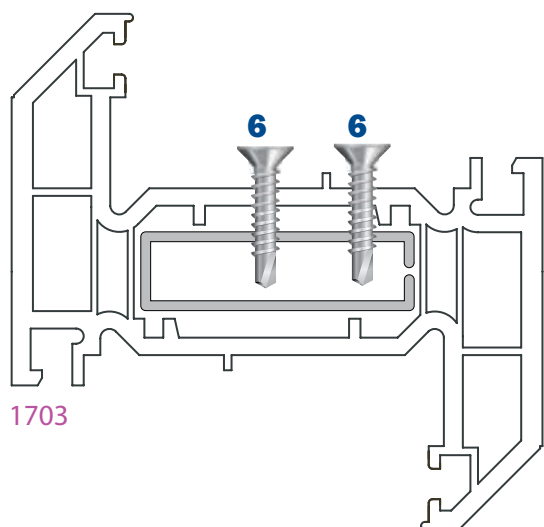
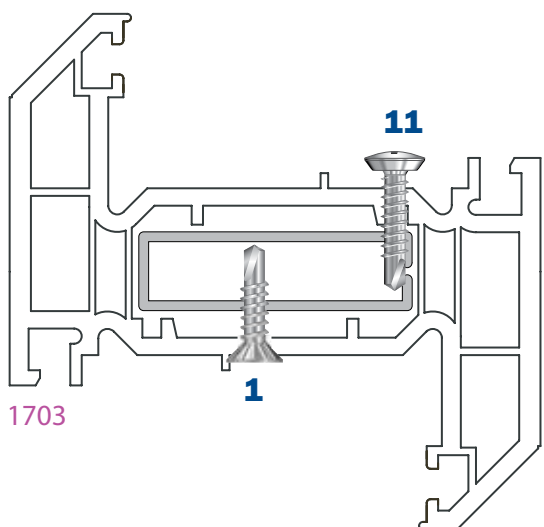
Mullions/Transoms - Unreinforced

'T' Mullions/Transoms

'Z' Mullions/Transoms

10		9847	SFG 4.3 x 20 Z	Friction stay
4		9836	CFG 4.3 x 30 Z	Keep
5		9846	CFG 4.3 x 35 Z	Raiser block, Pull-in block, Dog bolt
17		9832	MJS 4.8 x 80 Y	Mechanical jointing (not illustrated)

Mullions/Transoms - Reinforced



‘T’ Mullions/Transoms



‘Z’ Mullions/Transoms

1



9800

RSR 3.9 x 16 Z

Reinforcement retention

11



9812

SSR 3.9 X 16 Z

Friction stay

6



9808

CSR 3.9 x 19 Z

Keep

6



9808

CSR 3.9 x 19 Z

Raiser block, Pull-in block,
Dog bolt

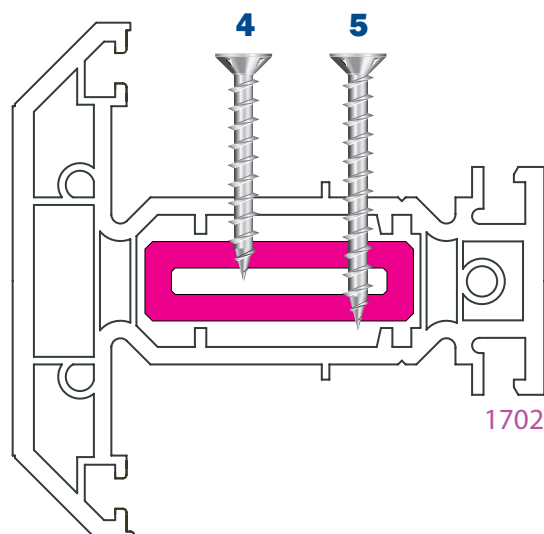
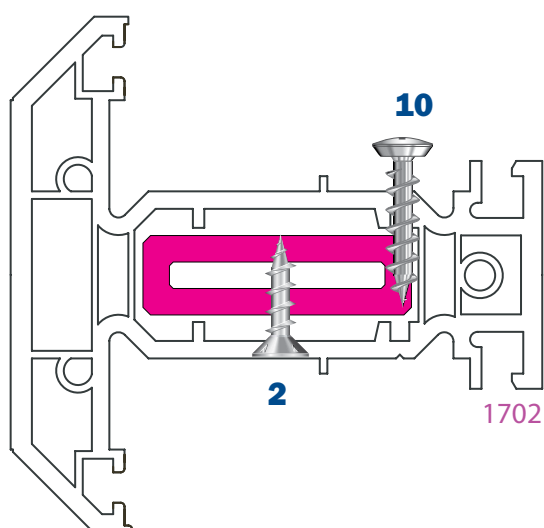
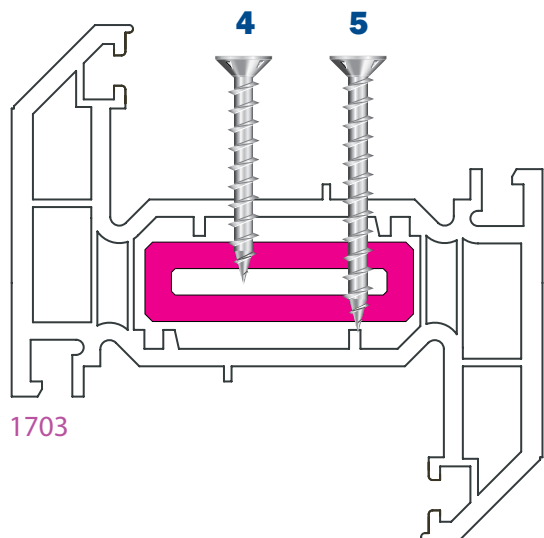
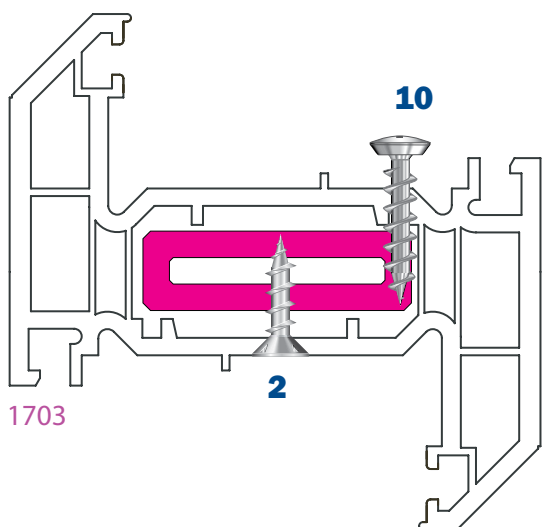
17







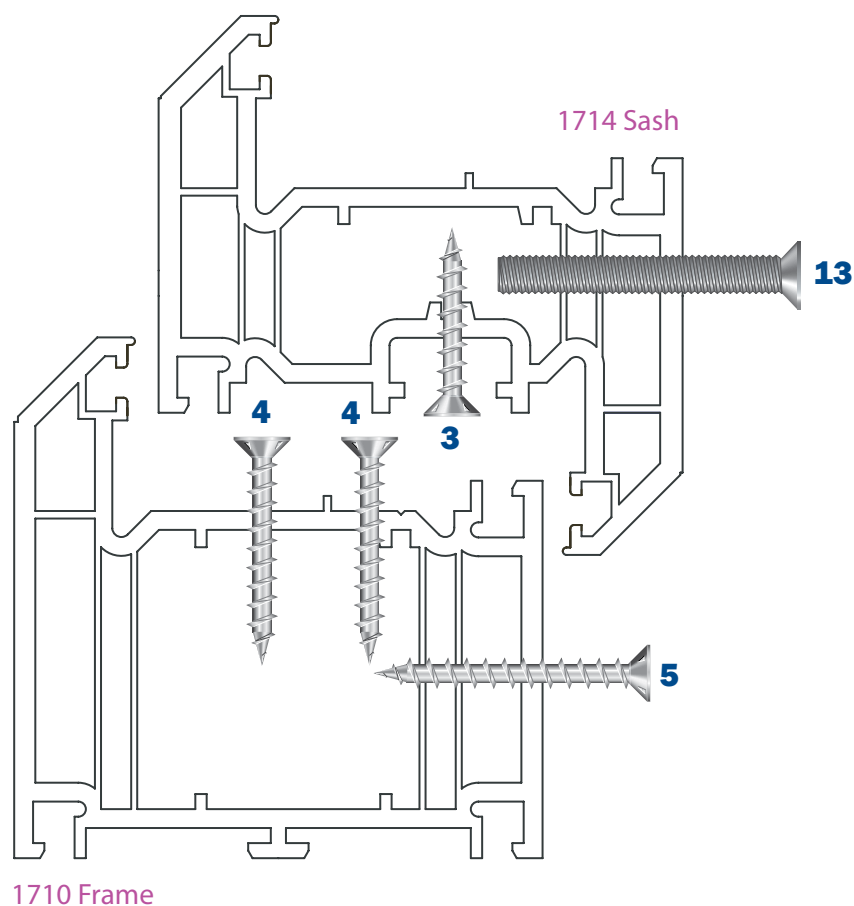
9832

MJS 4.8 x 80 Y

Mechanical jointing (not
illustrated)

Mullions/Transoms - RTR Bar

'T' Mullions/Transoms

'Z' Mullions/Transoms

2		9844	CFG 4.3 x 16 Z	Reinforcement retention
10		9847	SFG 4.3 x 20 Z	Friction stay
4		9836	CFG 4.3 x 30 Z	Keep
5		9846	CFG 4.3 x 35 Z	Raiser block, Pull-in block, Dog bolt
17		9832	MJS 4.8 x 80Y	Mechanical jointing (not illustrated)

Tilt & Turn - unreinforced

13


9818

MS M5 x 40 Z

Handle to gearbox

3


9845

CFG 4.3 x 25 Z

Gearing to sash

4


9836

CFG 4.3 x 30 Z

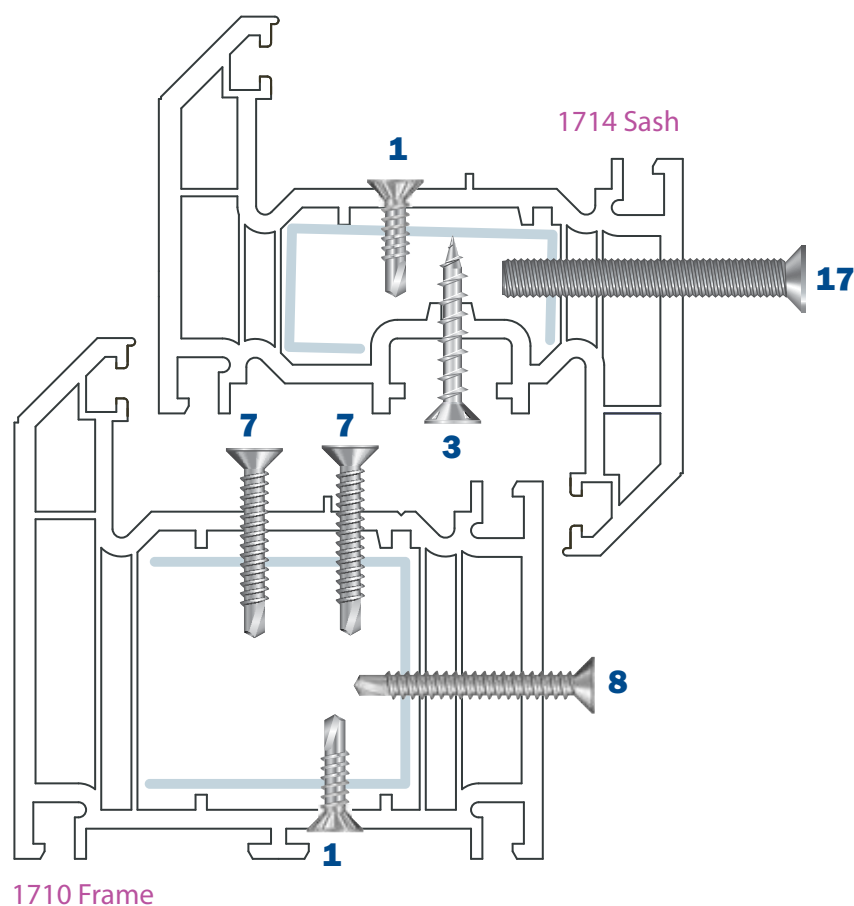
Keep to frame


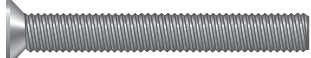



5


9846

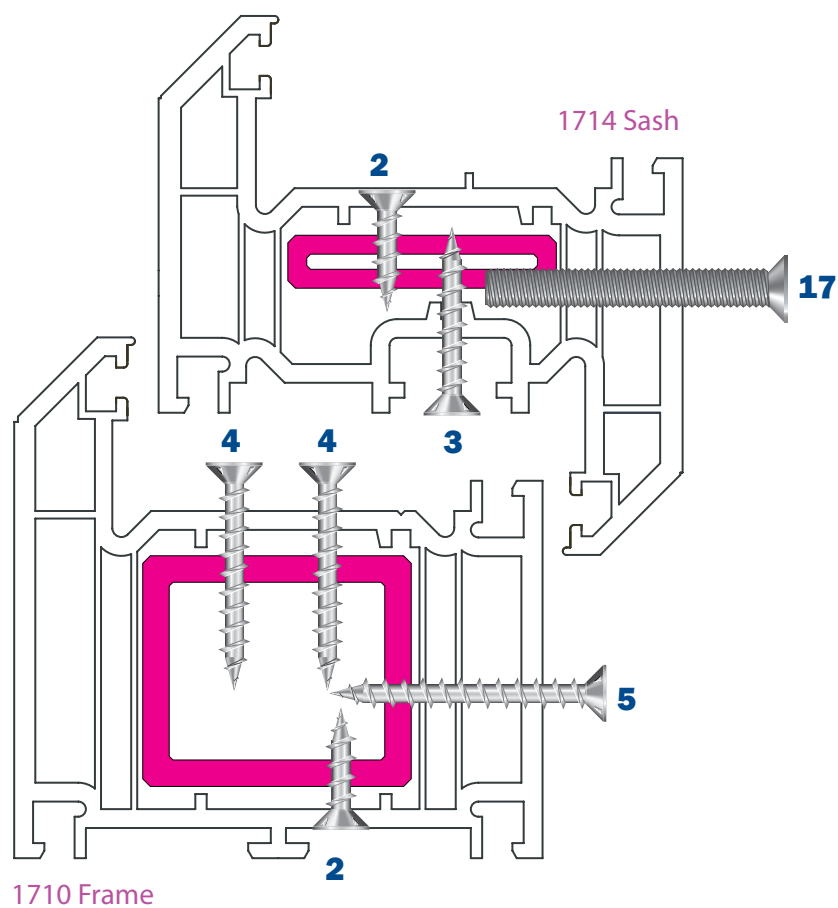
CFG 4.3 x 35 Z

Top & bottom hinge to frame

Tilt & Turn - reinforced


1		9800	RSR 3.9 x 16 Z	Reinforcement retention
17		9818	MS M5 x 40 Z	Handle to gearbox
3		9845	CFG 4.3 x 25 Z	Gearing to sash
7		9809	CSR 3.9 x 25 Z	Keep to frame
8		9810	CSR 3.9 x 32 Z	Top & bottom hinge to frame

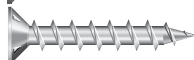
Tilt & Turn - RTR Bar


2


9844 CFG 4.3 x 16 Z Reinforcement retention

17


9818 MS M5 x 40 Z Handle to gearbox

3


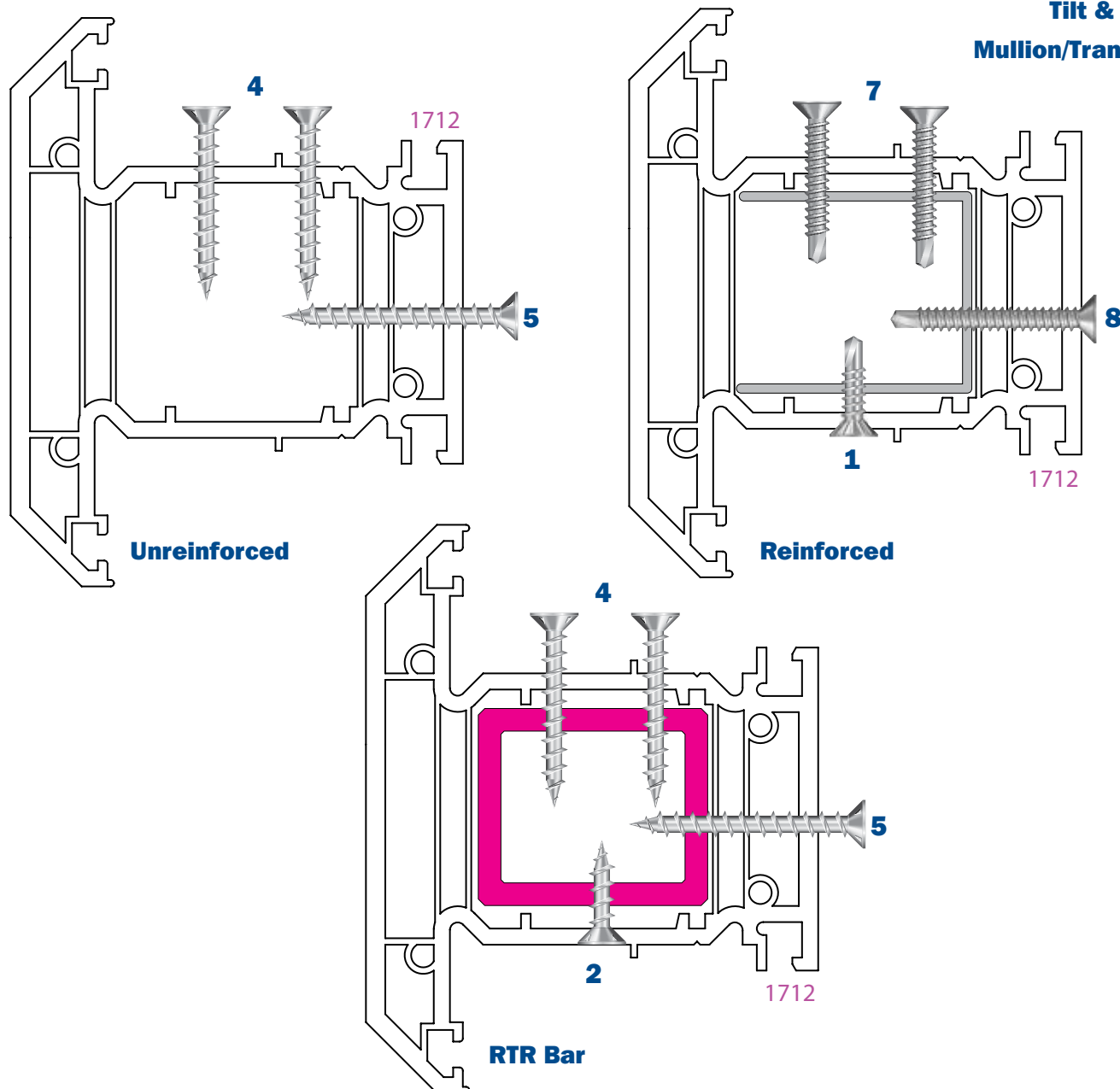
9845 CFG 4.3 x 25 Z Gearing to sash



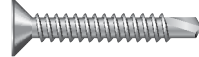
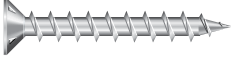



4


9836 CFG 4.3 x 30 Z Keep to frame

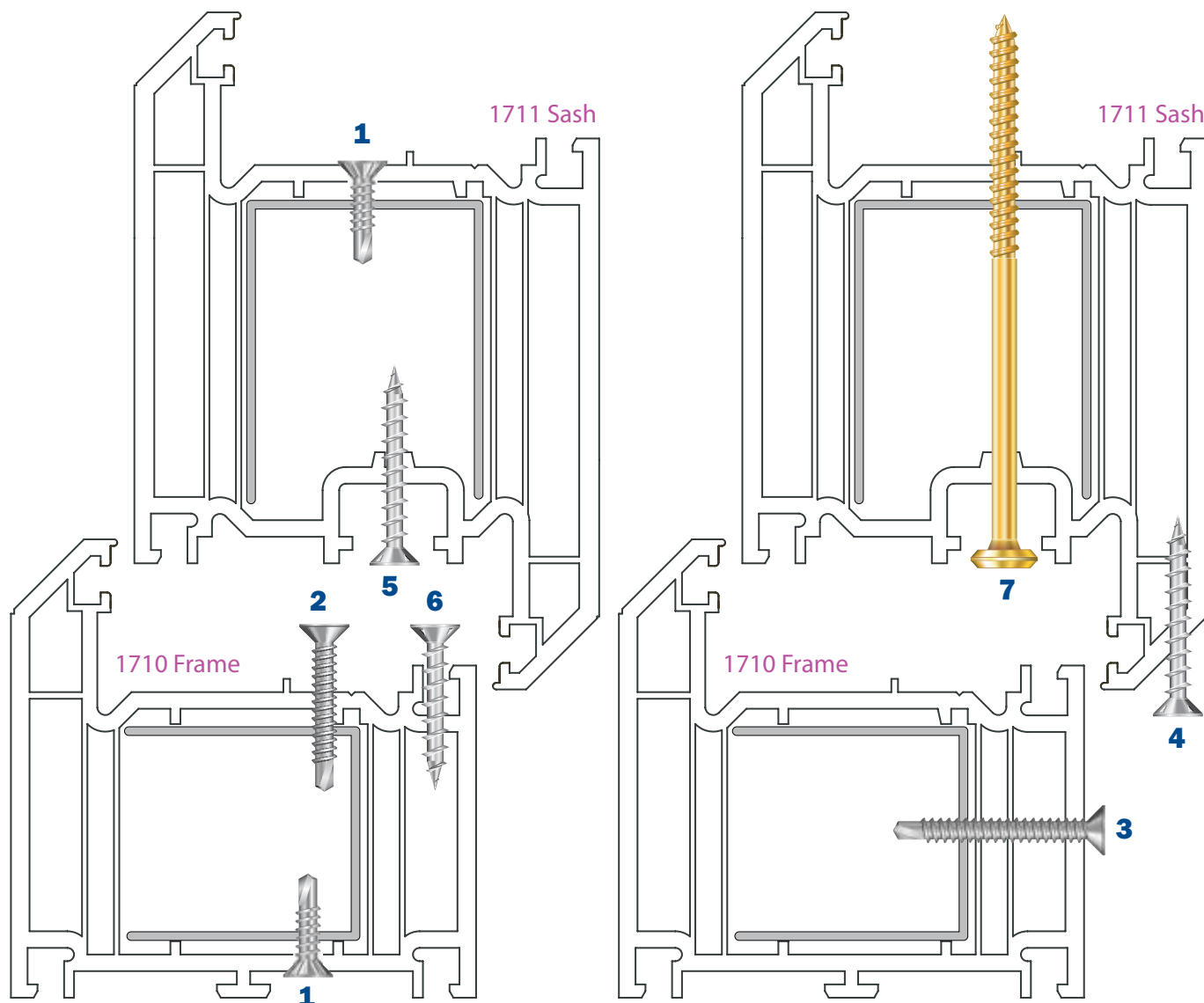
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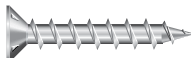



9846 CFG 4.3 x 35 Z Top & bottom hinge to frame

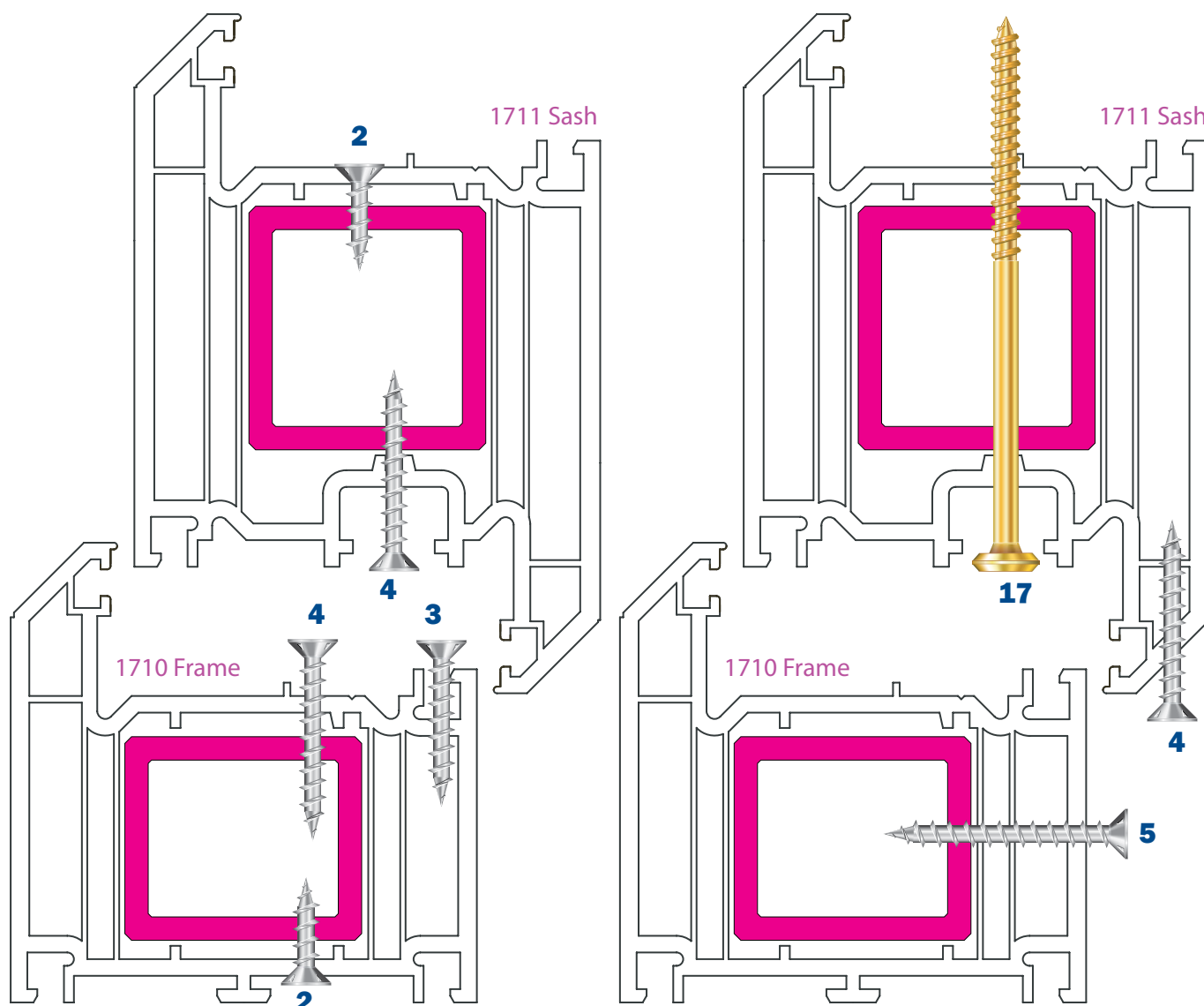
**Tilt & Turn
Mullion/Transom**










1		9800	RSR 3.9 x 16 Z	Reinforcement retention
2		9844	CFG 4.3 x 16 Z	Reinforcement retention
7		9809	CSR 3.9 x 25 Z	Keep reinforcement
4		9836	CFG 4.3 x 30 Z	Keep reinforcement
8		9810	CSR 3.9 x 32 Z	Top & bottom hinge - reinforced
5		9846	CFG 4.3 x 35 Z	Top & bottom hinge - unreinforced
17		9832	MJS 4.8 x 80 Y	Mechanical jointing (not illustrated)

Open-in Door – Butt Hinges – Reinforced

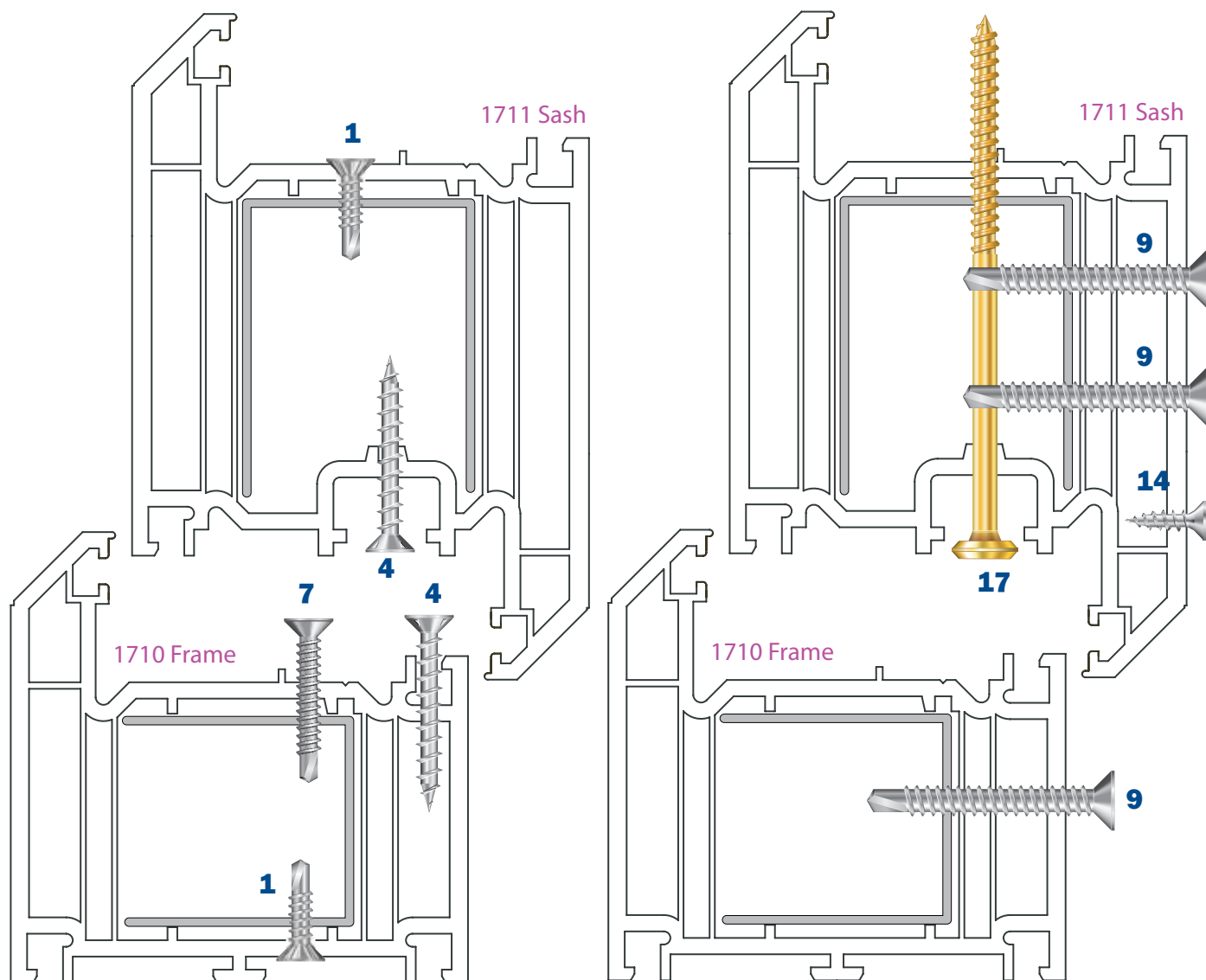




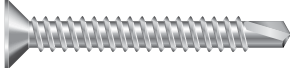





1		9800	RSR 3.9 x 16 Z	Reinforcement retention
7		9809	CSR 3.9 x 25 Z	Keep to frame
8		9810	CSR 3.9 x 32 Z	Butt hinge to frame
4		9836	CFG 4.3 x 30 Z	Butt hinge to sash
5		9836	CFG 4.3 x 30 Z	Gearing to sash
3		9845	CFG 4.3 x 25 Z	Keep to frame
17		9832	MJS 4.8 x 80 Y	Midrail to sash
16		9821	CPF 4.5 x 70 Z	Flying mullion to sash (as 17)

Open-in Door – Butt Hinges – RTR Bar


2		9844	CFG 4.3 x 16 Z	Reinforcement retention
4		9836	CFG 4.3 x 30 Z	Keep to frame
5		9846	CFG 4.3 x 35 Z	Butt hinge to frame
4		9836	CFG 4.3 x 30 Z	Butt hinge to sash
4		9836	CFG 4.3 x 30 Z	Gearing to sash
3		9845	CFG 4.3 x 25 Z	Keep to frame
17		9832	MJS 4.8 x 80 Y	Midrail to sash
16		9821	CPF 4.5 x 70 Z	Flying mullion to sash (as 17)

Open-in Door – Flag Hinges – Reinforced



1		9800	RSR 3.9 x 16 Z	Reinforcement retention
7		9809	CSR 3.9 x 25 Z	Keep to frame
9		9830	CSR 4.8 x 38 Z	Flag hinge to frame & sash
14		9816	CPF 3.5 x 12 Z	Flag Hinge to unreinforced area of sash
4		9836	CFG 4.3 x 30 Z	Gearing to sash
4		9836	CFG 4.3 x 30 Z	Keep to frame
17		9832	MJS 4.8 x 80 Y	Midrail to sash
16		9821	CPF 4.5 x 70 Z	Flying mullion to sash (as 7)

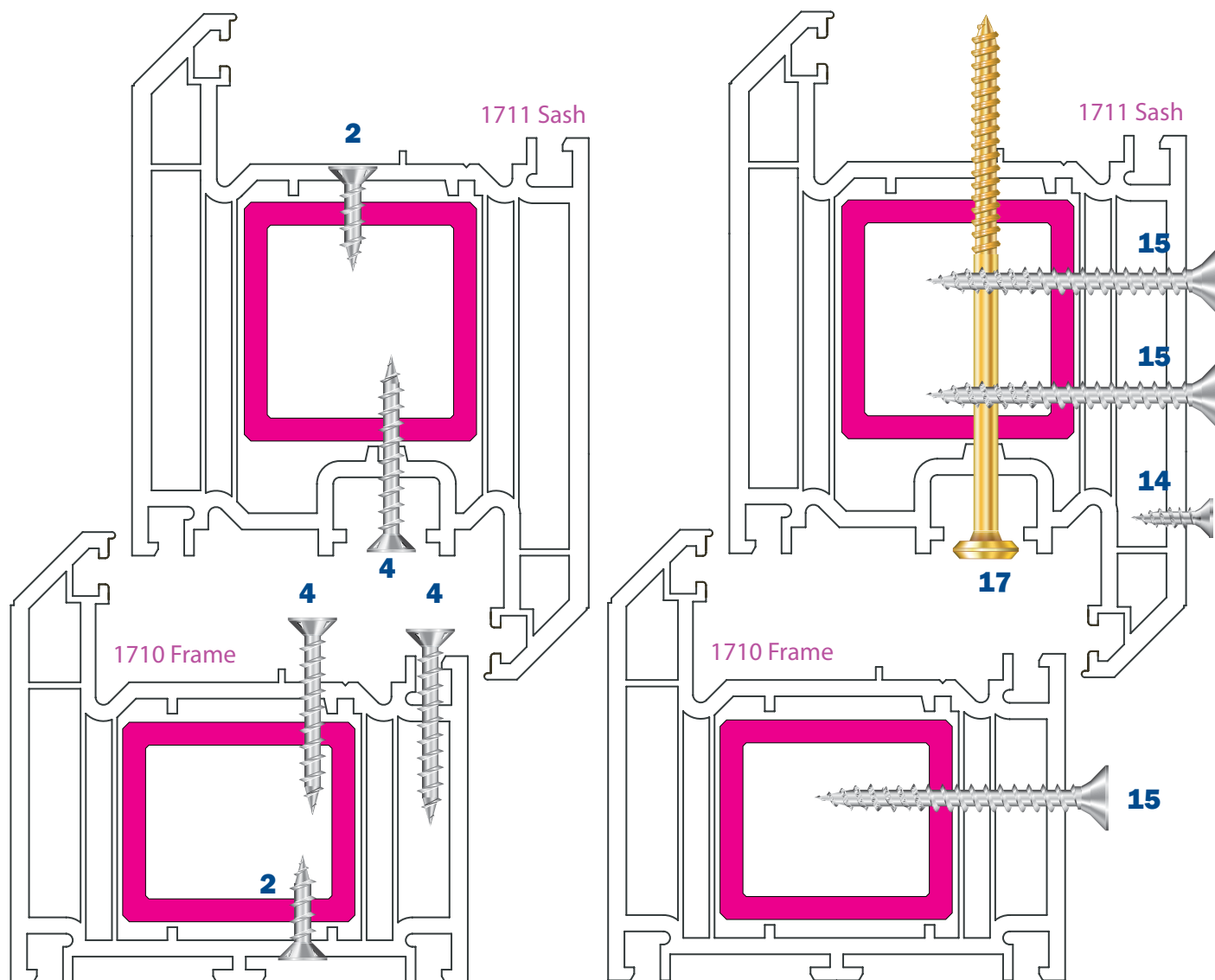


SELECTA

ADVANCE 7
EXTRUDING CONFIDENCE

StarPVCU

Open-in Door – Flag Hinges – RTR Bar



2



9844 CFG 4.3 x 16 Z Reinforcement retention

4



9836 CFG 4.3 x 30 Z Keep to frame

15



9846 CPF 4.5 x 45 Z Flag hinge to frame & sash

14



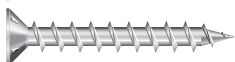
9816 CPF 3.5 x 12 Z Flag Hinge to unreinforced area of sash

4



9836 CFG 4.3 x 30 Z Gearing to sash

64



9836 CFG 4.3 x 30 Z Keep to frame

17



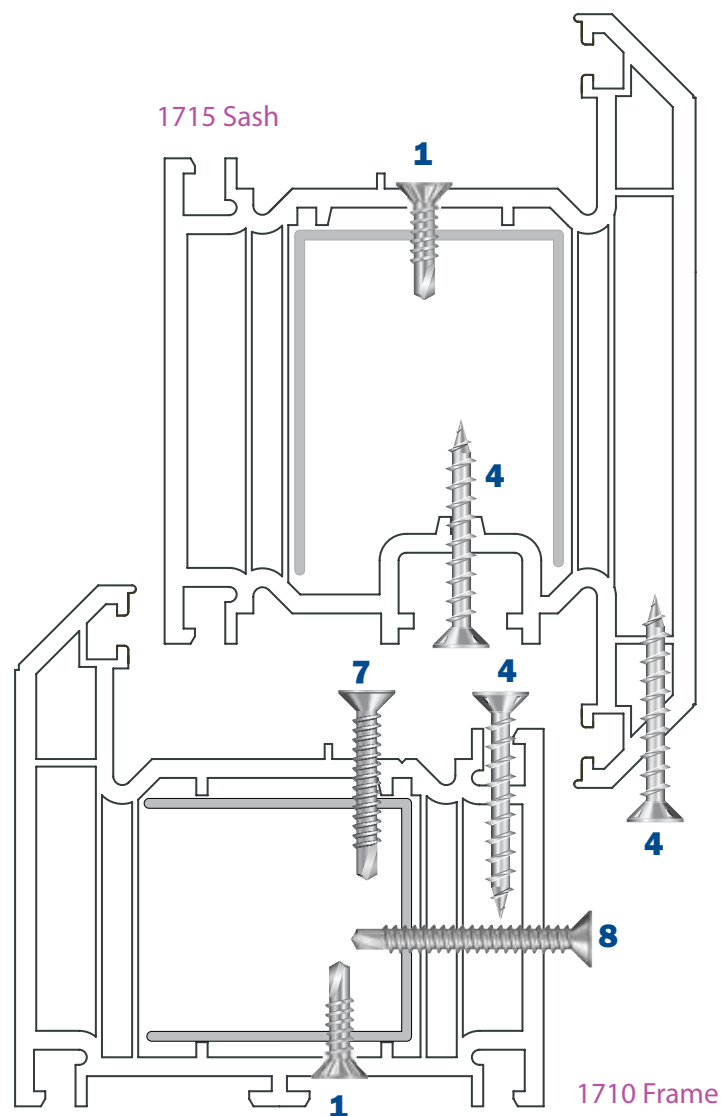
9832 MJS 4.8 x 80 Y Midrail to sash





16



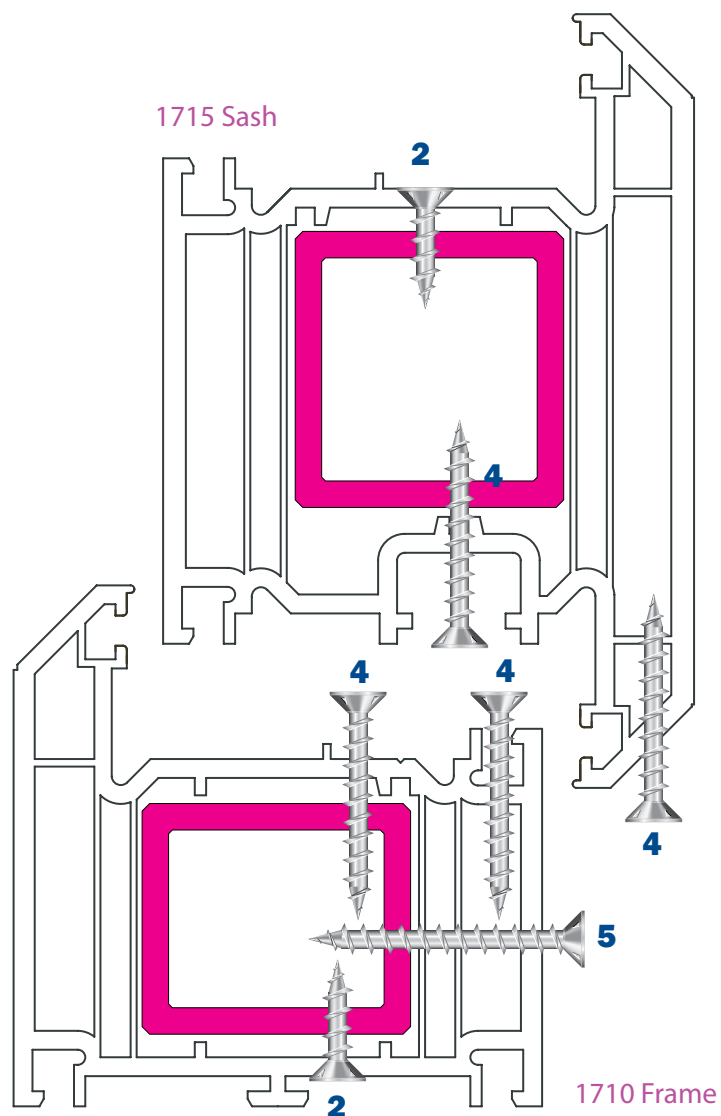
9821 CPF 4.5 x 70 Z Flying mullion to sash (as 7)

Open-out Door – Butt Hinges – Reinforced



1		9800	RSR 3.9 x 16 Z	Reinforcement retention
7		9809	CSR 3.9 x 25 Z	Keep to frame
4		9836	CFG 4.3 x 30 Z	Butt Hinge to sash
4		9836	CFG 4.3 x 30 Z	Gearing to sash
4		9836	CFG 4.3 x 30 Z	Keep to frame
8		9810	CSR 3.9 x 32 Z	Butt hinge to frame

Open-out Door – Butt Hinges – RTR Bar


2


9844 CFG 4.3 x 16 Z Reinforcement retention

4


9836 CFG 4.3 x 30 Z Keep to frame

4


9836 CFG 4.3 x 30 Z Butt Hinge to sash

4


9836 CFG 4.3 x 30 Z Gearing to sash

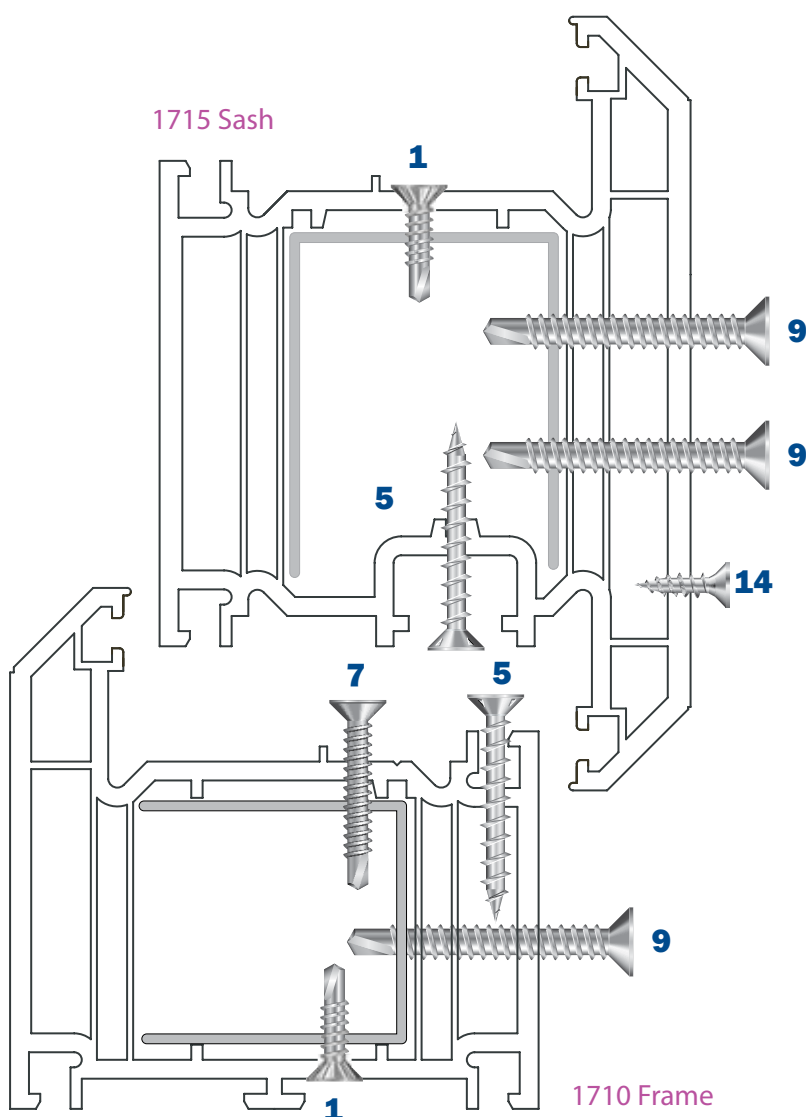
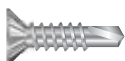
4


9836 CFG 4.3 x 30 Z Keep to frame

5


9846 CFG 4.3 x 35 Z Butt hinge to frame

Open-out Door – Flag Hinges – Reinforced


1


9800 RSR 3.9 x 16 Z Reinforcement retention

7


9809 CSR 3.9 x 25 Z Keep to frame

9


9830 CSR 4.8 x 38 Z Flag hinge to frame & sash

14

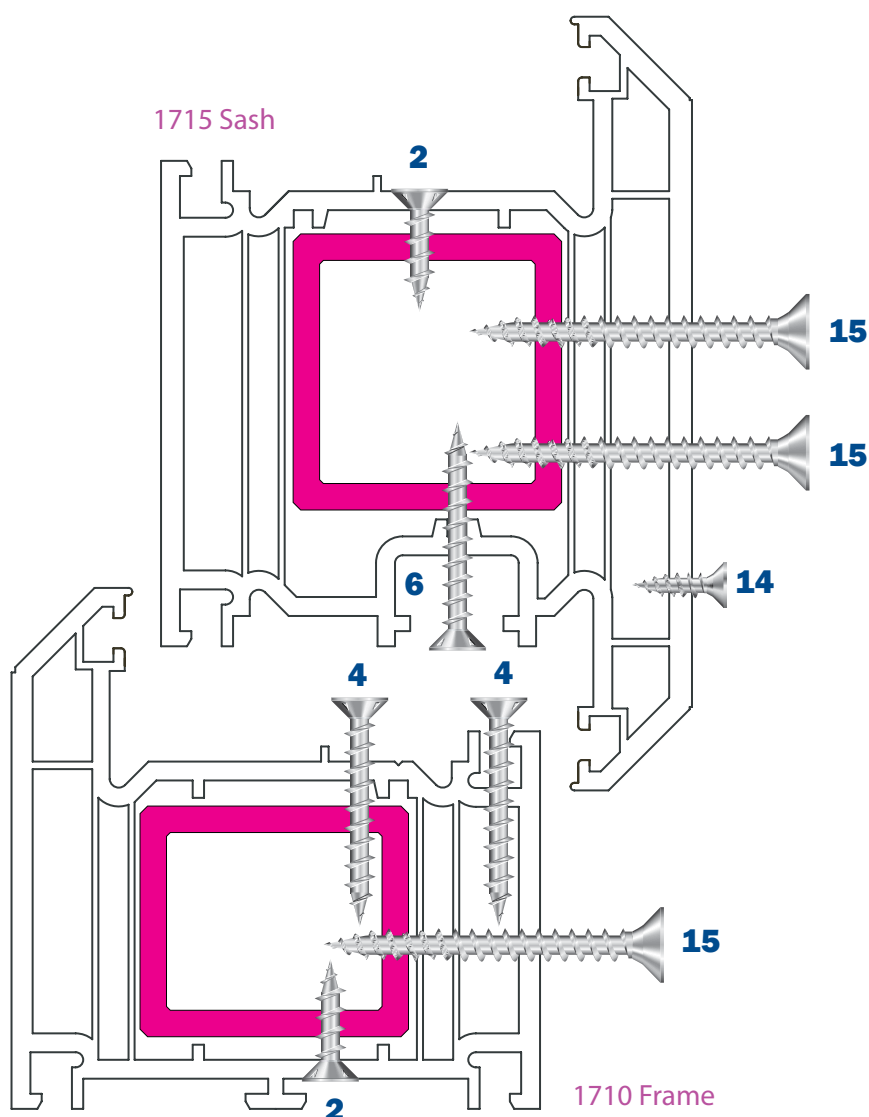

9816 CPF 3.5 x 12 Z Flag hinge to unreinforced area of sash



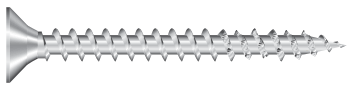



5


9836 CFG 4.3 x 30 Z Keep to frame

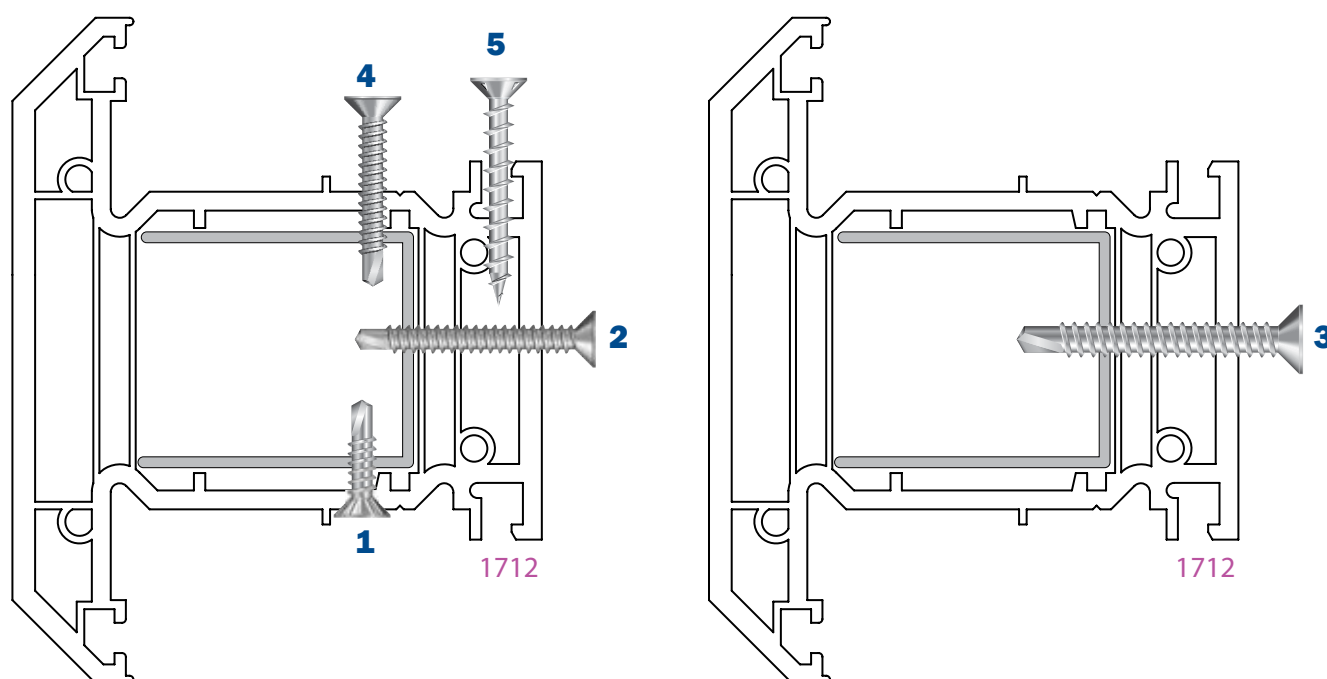
5






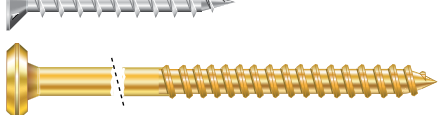

9836 CFG 4.3 x 30 Z Gearing to sash

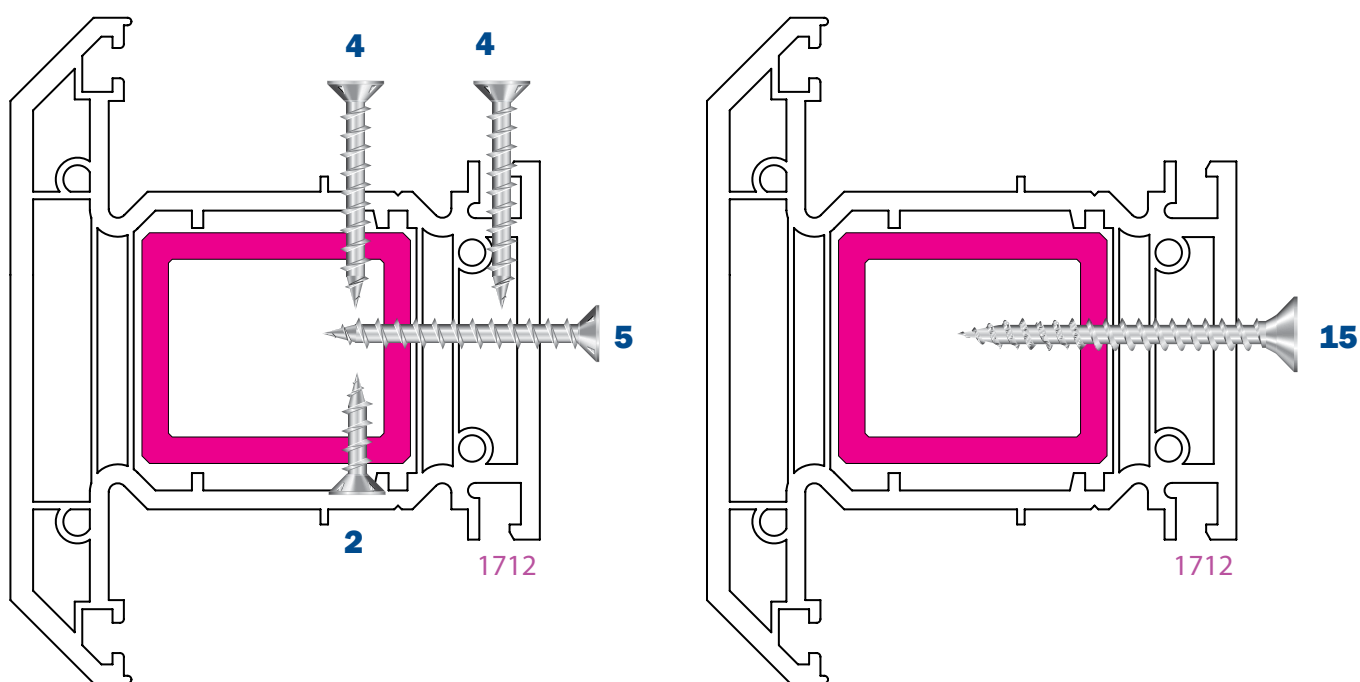
Open-out Door – Flag Hinges – RTR Bar






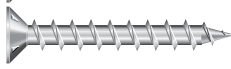

2		9844	CFG 4.3 x 16 Z	Reinforcement retention
4		9836	CFG 4.3 x 30 Z	Keep to frame
15		9849	CPF 4.5 x 45 Z	Flag hinge to frame & sash
14		9816	CPF 3.5 x 12 Z	Flag hinge to unreinforced area of sash
4		9836	CFG 4.3 x 30 Z	Keep to frame
4		9836	CFG 4.3 x 30 Z	Gearing to sash

Door Mullion/Transom – Reinforced

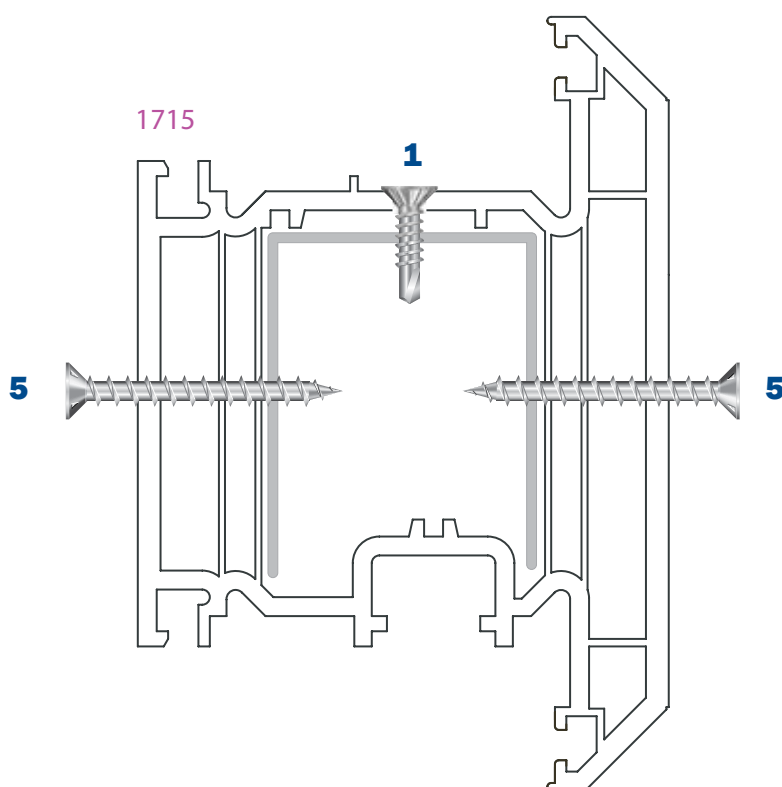


1		9800	RSR 3.9 x 16 Z	Reinforcement retention
8		9810	CSR 3.9 x 32 Z	Butt hinge
9		9830	CSR 4.8 x 38 Z	Flag hinge
7		9809	CSR 3.9 x 25 Z	Keep
4		9836	CFG 4.3 x 30 Z	Keep
17		9832	MJS 4.8 x 80 Y	Mechanical jointing (not illustrated)

Door Mullion/Transom – RTR Bar


2		9844	CFG 4.3 x 16 Z	Reinforcement retention
5		9846	CFG 4.3 x 35 Z	Butt hinge
15		9849	CPF 4.5 x 45 Z	Flag hinge
4		9836	CFG 4.3 x 30 Z	Keep
4		9836	CFG 4.3 x 30 Z	Keep
17		9832	MJS 4.8 x 80 Y	Mechanical jointing (not illustrated)

Door Midrail – Reinforced


1


9800

RSR 3.9 x 16 Z

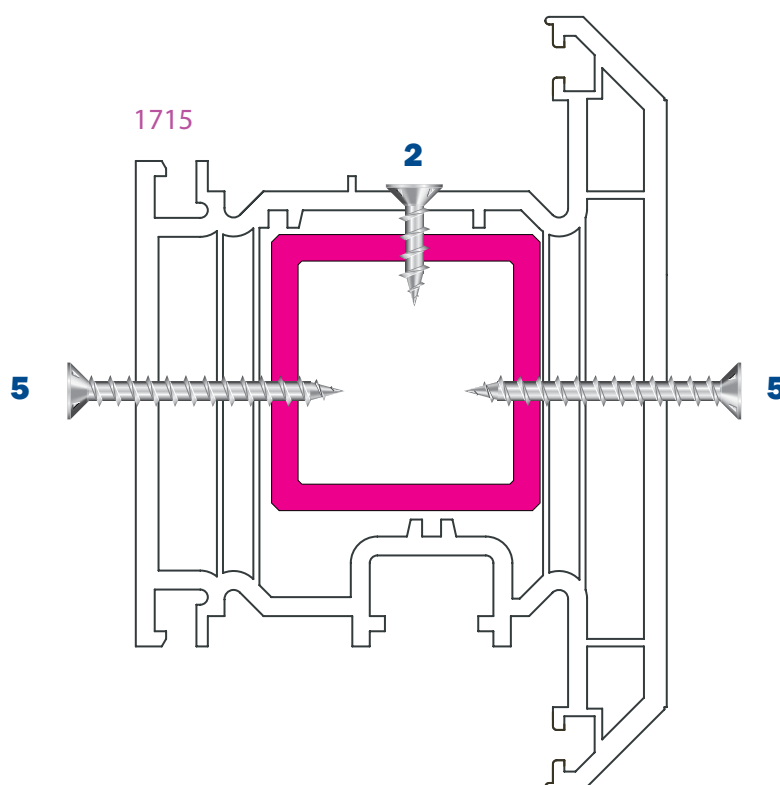
Reinforcement retention

5


9846

CFG 4.3 x 35 Z

Letter flap (unreinforced)

Door Midrail – RTR Bar

2


9844 CFG 4.3 x 16 Z Reinforcement retention

5


9846 CFG 4.3 x 35 Z Letter flap (unreinforced)



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Application illustrations are 1:1 scale.