



RSR
MULTI-MATERIAL JOINING

Next Generation Automotive Assembly

Spot Weld + Rivet = RSR

Mixed Material Spot Welding for Next Generation Structures



The Resistance Spot Rivet, or RSR[®], is a leading technology in consumable fasteners that allows for a wide variety of mixed material joining in high-speed, automated facilities.

Developed in collaboration with automotive industry leaders, the team of automated welding specialists at CenterLine (Windsor) Limited and Howmet Fastening Systems have made RSR a remarkable assembly solution.

By leveraging your existing RSW infrastructure, the addition of our rivet delivery system provides you with a highly versatile assembly machine to support ever-increasing lightweighting goals.

- Maintain and leverage RSW capabilities and expertise
- Seamlessly transition between RSW and RSR joining within the workpiece
- Address a variety of mixed material joints in piloted and pre-piloted applications
- Benefit from a single-step operation - No pre-inserting of elements
- Work within the bounds of existing shop constraints



RSR® Bridges the Joining Gap of Conventional RSW

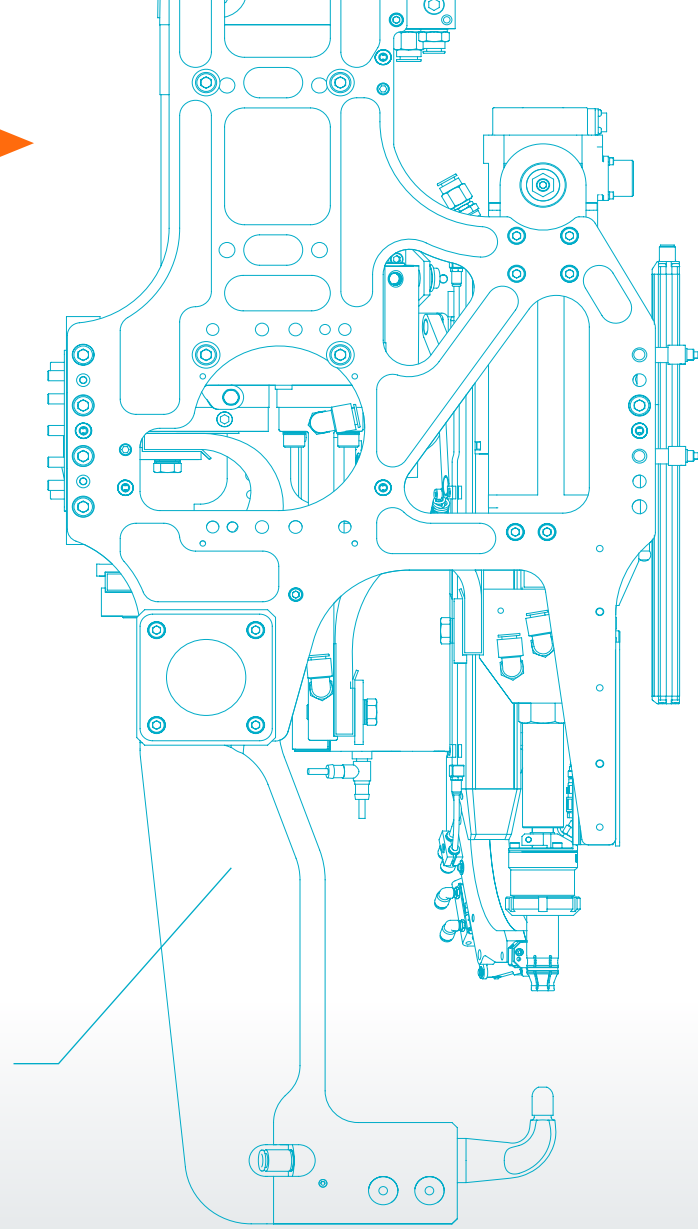
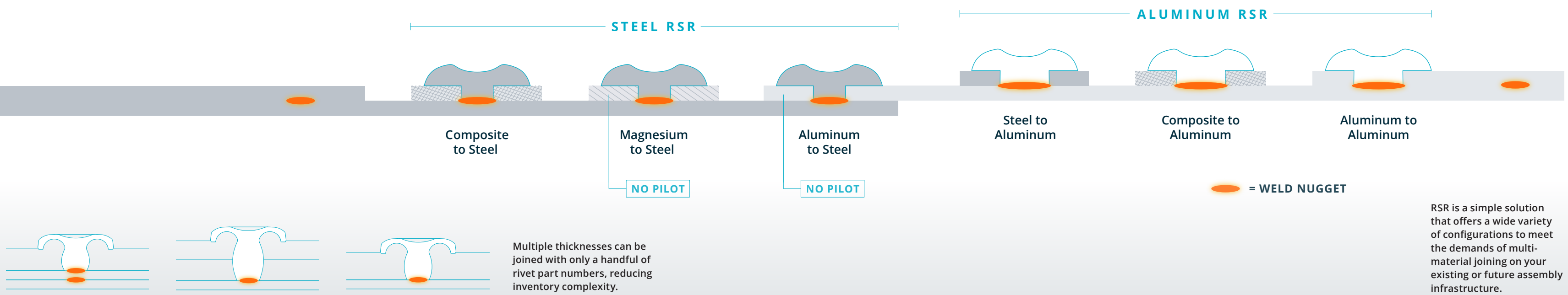
RSR can accommodate a broad selection of top sheets, from castings to extrusions, to painted and non-metallic materials.

Unlike other consumable-element welding processes, RSR does not require the pre-insertion of the rivet, cutting down on

additional CAPEX and unnecessary material handling. In certain steel RSR applications, the fastener can be installed without a pilot hole. This self-piloting process alleviates the issue of locating a hole, allowing for increased tolerances and less-nuanced programming.

Retrofit for the Future

An RSR® system is a small addition that can be made to existing spot-welding guns. When sheets are fed to the upgraded welder, an RSR rivet is dispensed through the added feed system to become part of the weld. This simple addition of a rivet feeder creates the opportunity to seamlessly transition back and forth between RSR and traditional spot welding processes.



RSR is a simple solution that offers a wide variety of configurations to meet the demands of multi-material joining on your existing or future assembly infrastructure.

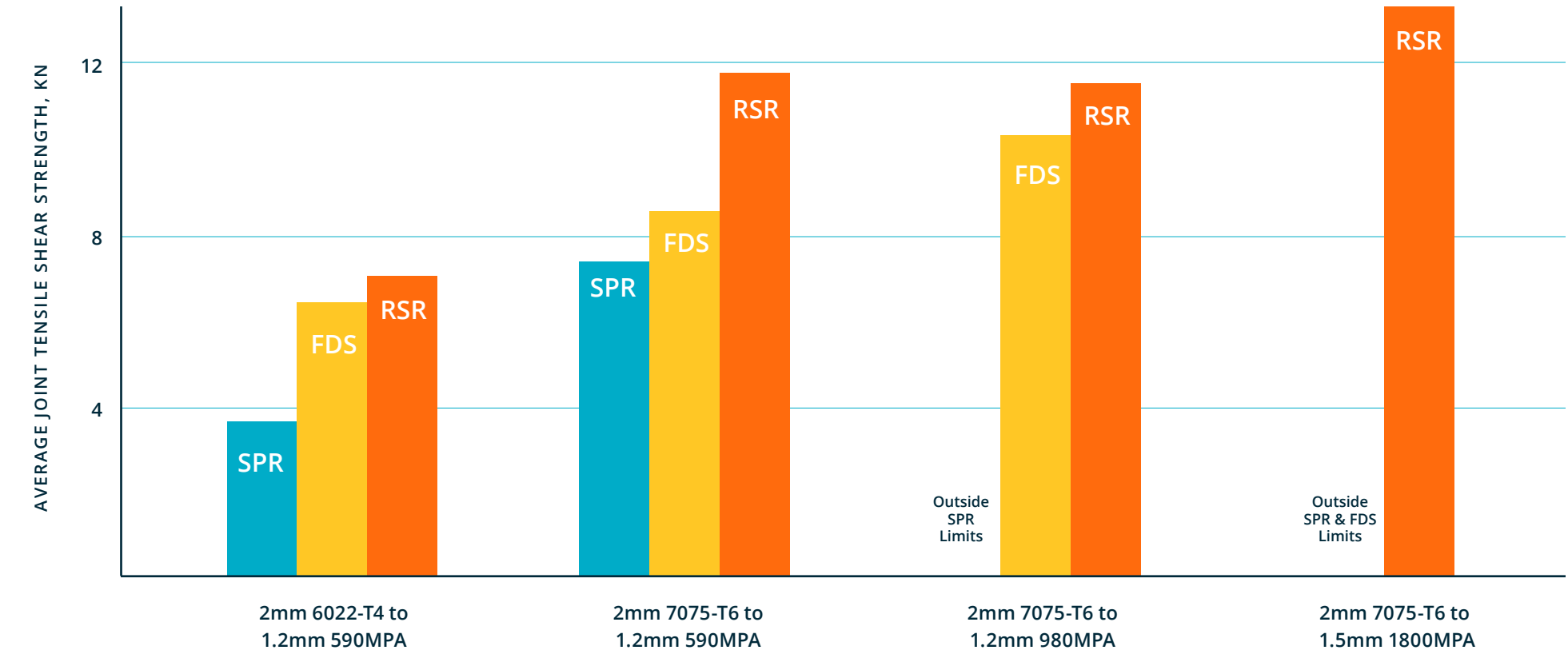
RSR Is The Most Versatile Multi-Material Joining Technology Available Today

Adding RSR to your existing RSW infrastructure is a simple, specialized rivet-feeder attachment that adds versatility to each welding station and outperforms other multi-material joining technologies.

	RSR®	Self-Piercing Rivets	Flow-Drill Screws	Friction Bit Joining
EXISTING INFRASTRUCTURE	✓			
>1000 MPA SHEET	✓		✓	✓
NON-METALLIC TOP SHEETS	✓		✓	
LOW ADDED MASS	✓	✓		✓
INSTALL SPEED	✓	✓		
PREDICTABLE FAILURE MODES	✓		✓	
LOW SKU COMPLEXITY	✓		✓	

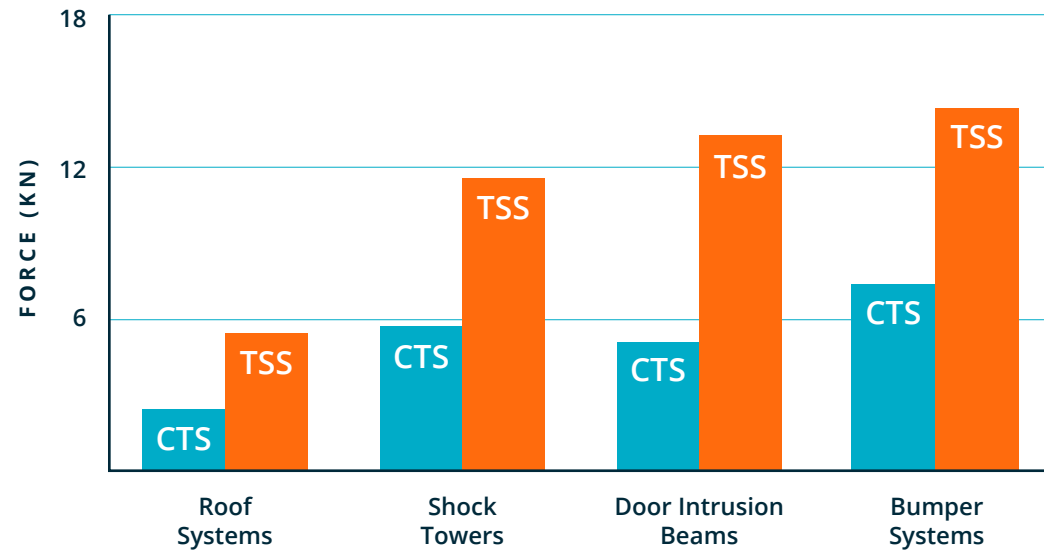
Stronger Than Other Technologies for Current and Future Automotive Materials

Joining automotive structure materials with RSR adds shear and tensile strength that Flow Drill Screws, Self-Piercing Rivets and other automated assembly technologies cannot achieve without adding notable time to your production line.

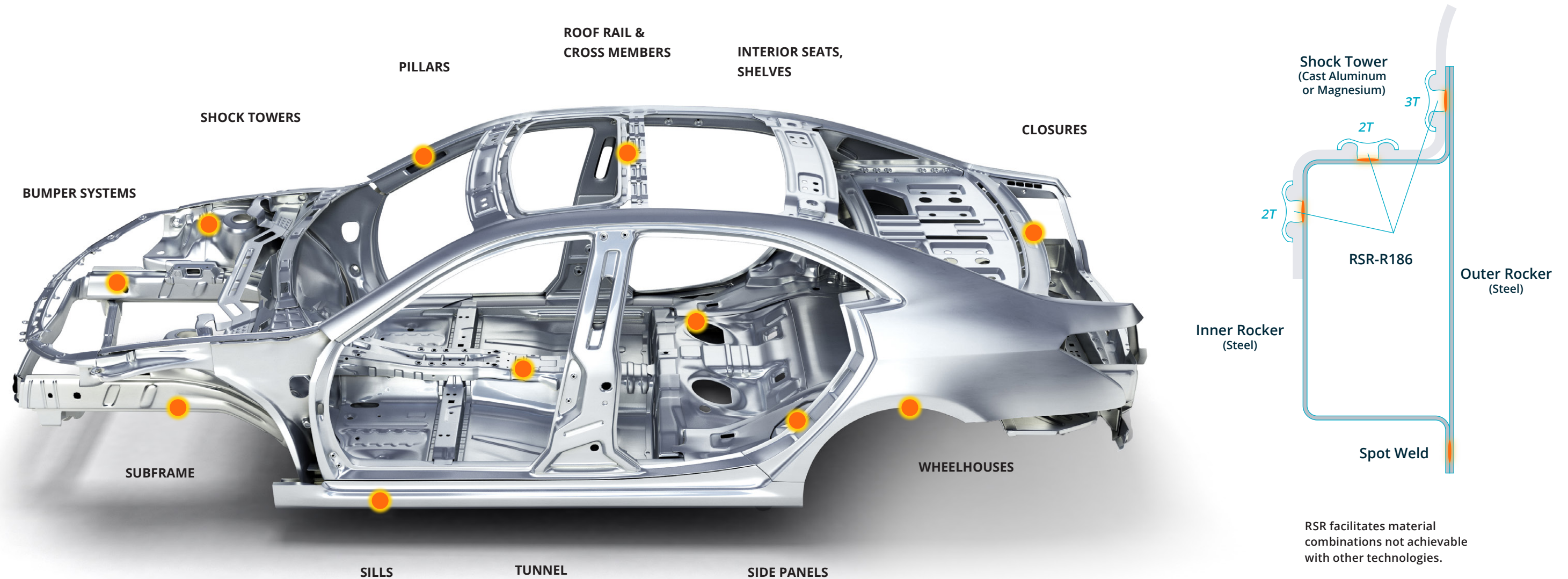


Targeted for Multi-Material BIW and Closure Assembly

RSR can be used to join a wide variety of multi-material combinations employing high volume automation.



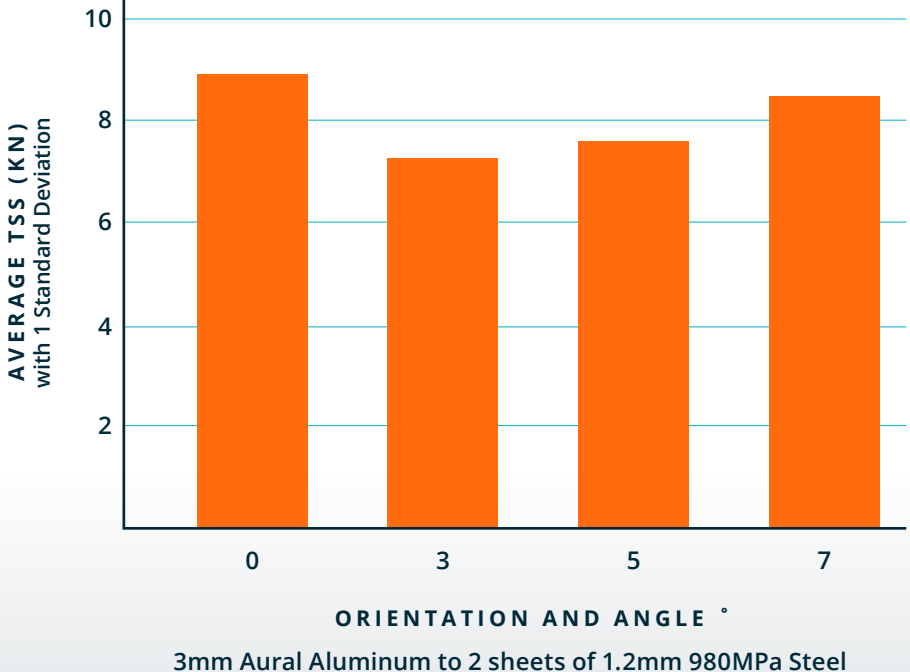
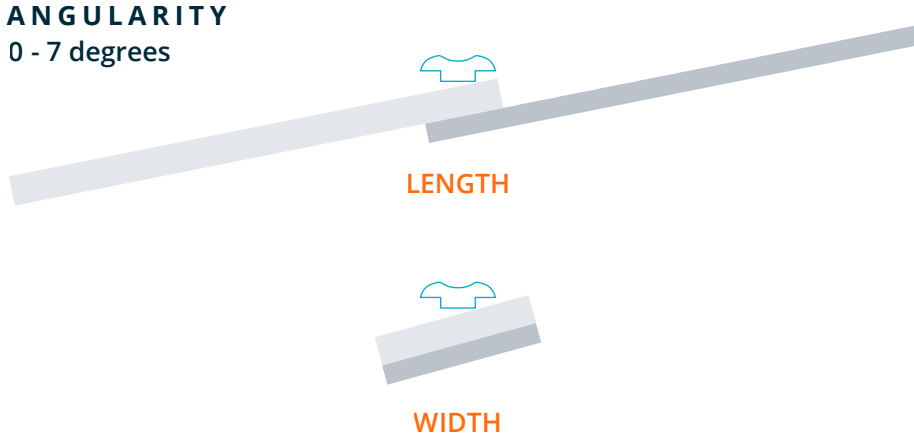
There are notable performance improvements when RSR rivets are automatically fed into your spot welded joints in both Cross Tensile Strength (CTS) and Tensile-Shear Strength (TSS) measures.



RSR facilitates material combinations not achievable with other technologies.

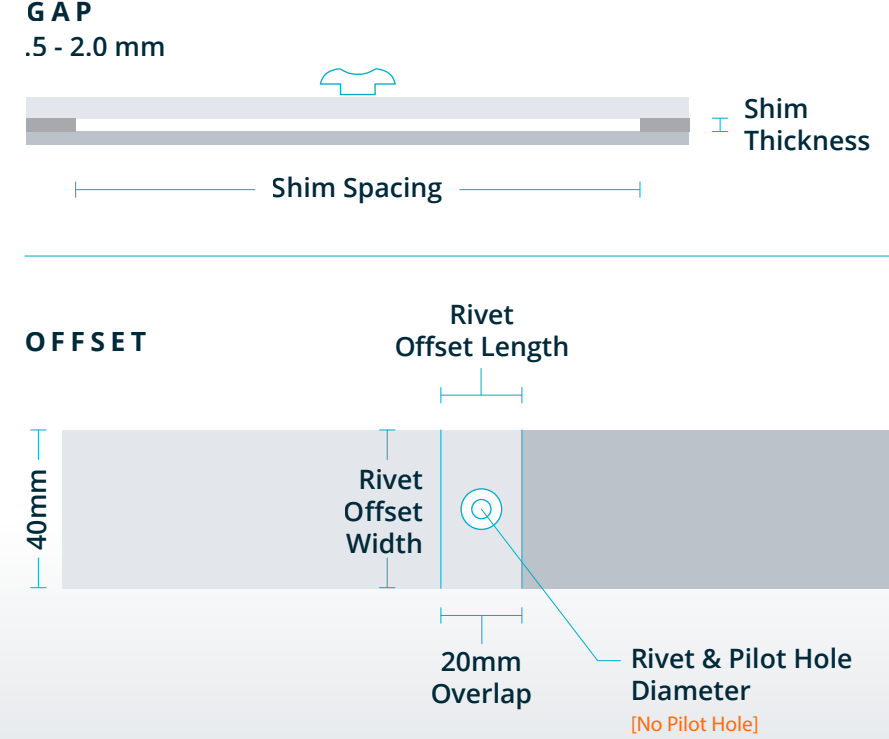
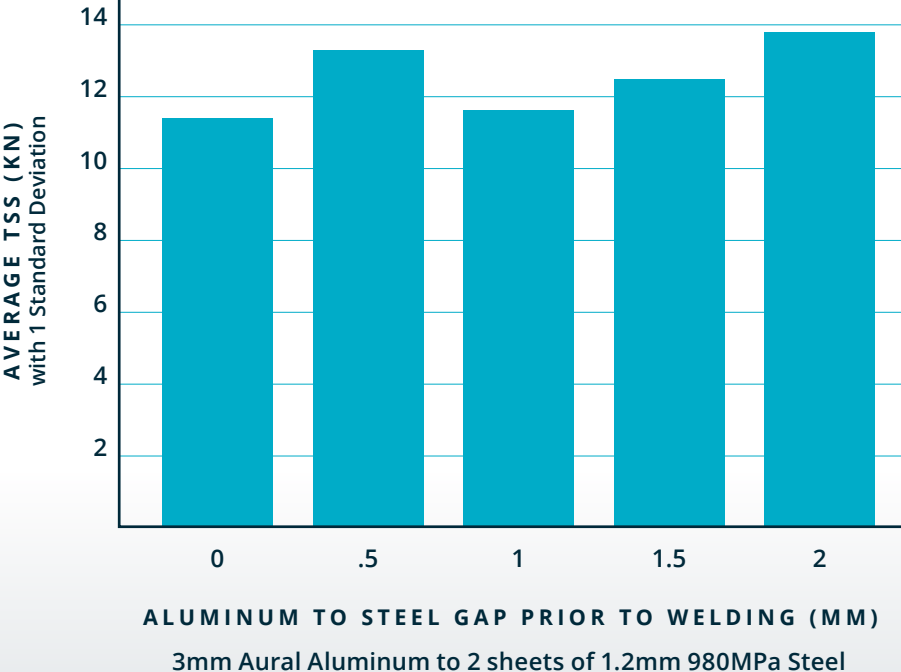
Robust Performance in Production Condition Simulation

Various stack-up conditions that simulate production environments show that Rivet Offset, Workpiece Angularity and Part Gap will retain at least 70% of baseline RSR joint strength.



Excellent Strengths Achieved under Severe Production Conditions

The addition of RSR rivets matched to your material-joining requirements offers superior, industry-leading strength where angled or gapped fastening may be needed.





Howmet Fastening Systems

INDUSTRIAL DIVISION BRANDS



Huck, Marson, Recoil, Keysert, Camloc and Simmonds are trademarks of Howmet Aerospace Inc. and/or its subsidiaries.

RSR® Technology Development, Evaluation and Deployment

FOR MORE
INFORMATION ON
RSR TECHNOLOGY



HFS Product and Process Development Laboratory

- Weld schedule evaluation
- Coupon manufacturing
- Mechanical testing
- Prototyping



CenterLine RSR and RDS Robotic Pilot Line

- Process demonstration
- Prototyping
- Production evaluation
- Cycle testing

Waco Operations

PO Box 8117

8001 Imperial Dr, Waco, TX 76714-8117

Tel: +1 800-388-4825 | Fax: +1 800-798-4825

huck.waco@howmet.com

hf industrial.com [YouTube.com/HFSIndustrial](https://www.youtube.com/HFSIndustrial)

The information contained in this publication is only for general guidance, and is not intended to create any warranty, express, implied, or statutory; all warranties are contained only in Howmet Fastening Systems' written quotations, acknowledgments, and/or purchase orders. It is recommended that the user secure specific, up-to-date data and information regarding each application and/or use of such products

© 2021 Howmet Aerospace Inc. All rights reserved. RSR is a registered trademark of Howmet Aerospace Inc. and/or its subsidiaries. HFS7046 0921