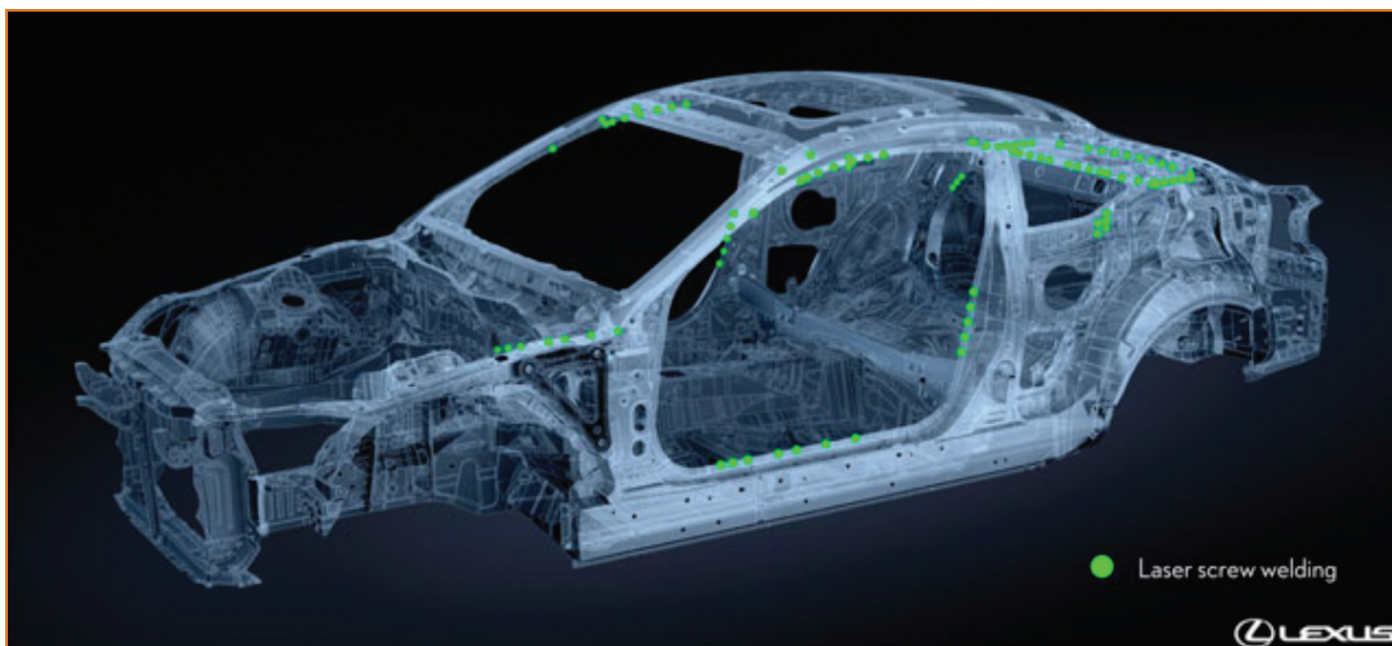


TECHNICAL REPORT



AUTO BODY TECHNOLOGIES:

A LOOK INTO
TOYOTA / LEXUS
WELDING METHODS ON
THE PRODUCTION LINE -



Just when most of us have been thinking that there are unlikely to be any other ways to join metals together, Toyota / Lexus have been incorporating a variation of the traditional spot weld (STRSW) into the construction of a number of their vehicle body assembly lines.

That welding process is called **LASER SCREW WELDING (LSW)** and is part of the Toyota **New Global Architecture** initiative (**TNGA**).

First used on the Lexus LS platform in 2013, it is now being utilised on numerous other Toyota models. At this time, **LSW** is used alongside conventional spot welding methods, but may eventually replace STRSW entirely – Toyota claim that both welding speed and strength is increased dramatically when compared to traditional spot welding.

Laser screw welding involves the use of a high intensity laser beam – this beam produces a concentrated heat source over a very short weld cycle. The completed weld connection is both narrow and deep.

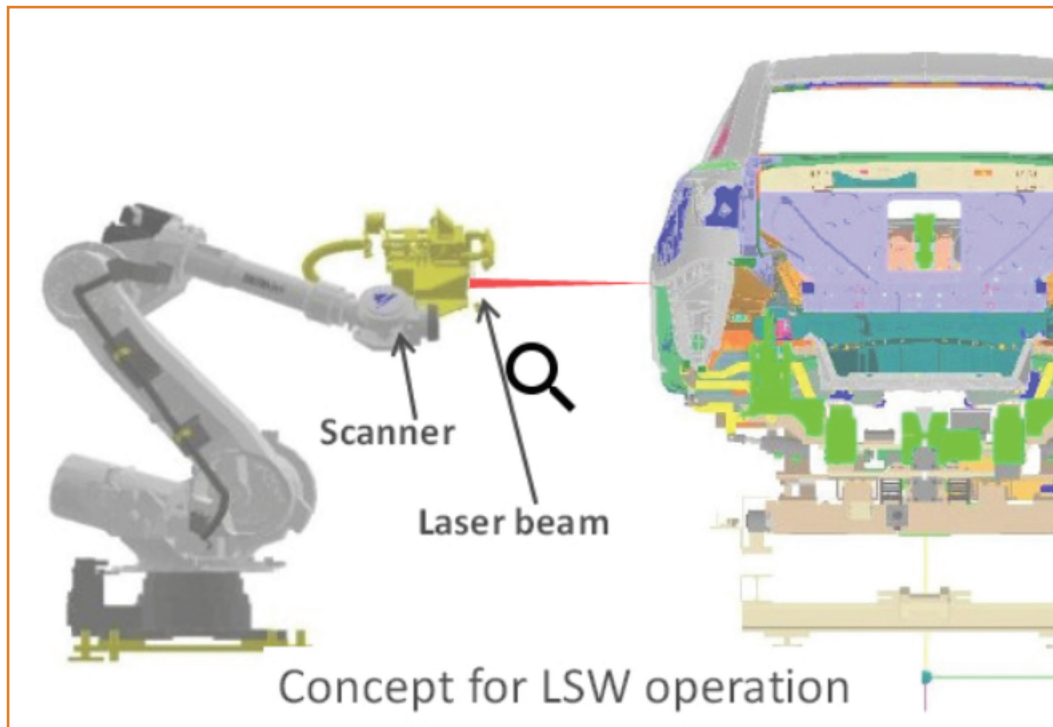
The logo for Resene Automotive & Light Industrial, featuring the word 'Resene' in a large, bold, white font, with 'Automotive & Light Industrial' in a smaller font below it, all on a dark background.

Coatings Experts at your door
0800 108 008 www.rali.co.nz

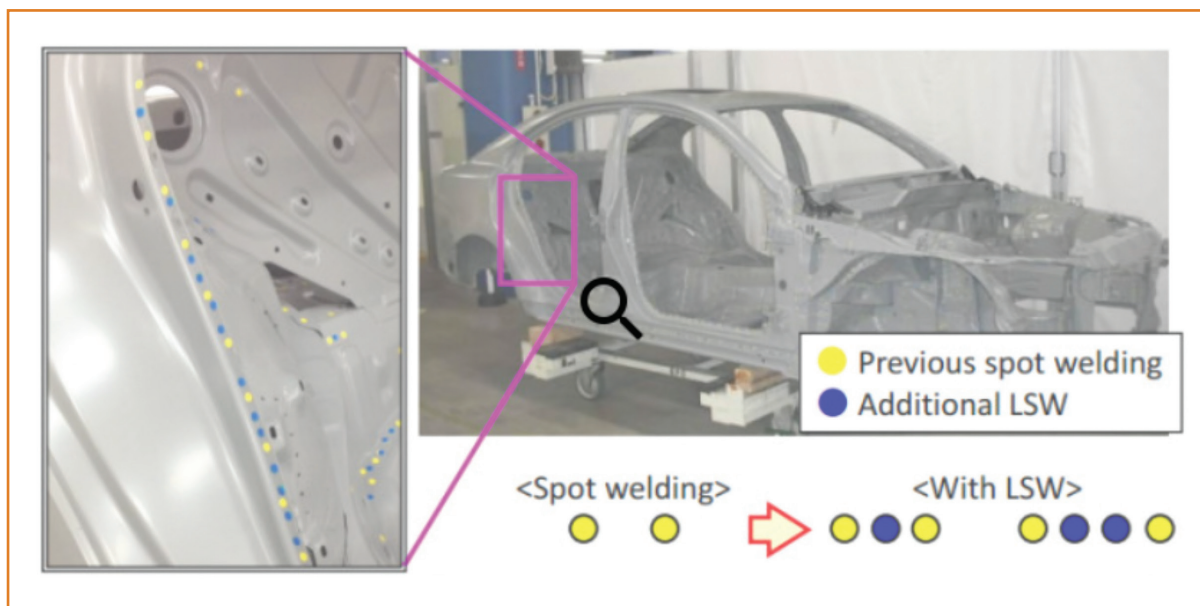
The logo for Cromax, featuring the word 'Cromax' in a bold, red font, with a stylized red and white graphic element to the left.

The logo for STANDEX, featuring the word 'STANDEX' in a bold, blue font, with a stylized blue and white graphic element to the left.

TECHNICAL REPORT



The result is a reduction in distortion, with better penetration and no “thinning” of the metals being joined (as occurs in “Squeeze” Type Resistance Spot Welding). Further benefits include the allowance of a larger tolerance between the mating flanges, and the ability to complete stronger welds on multiple plate thicknesses.



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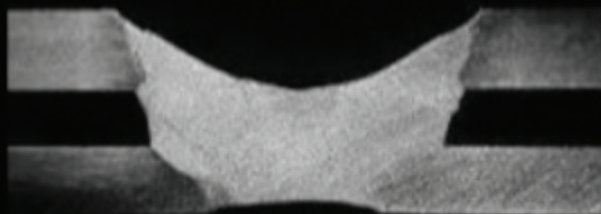
Cromax

STANDOX

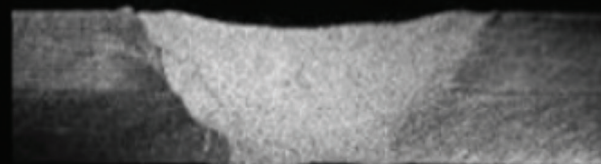
TECHNICAL REPORT



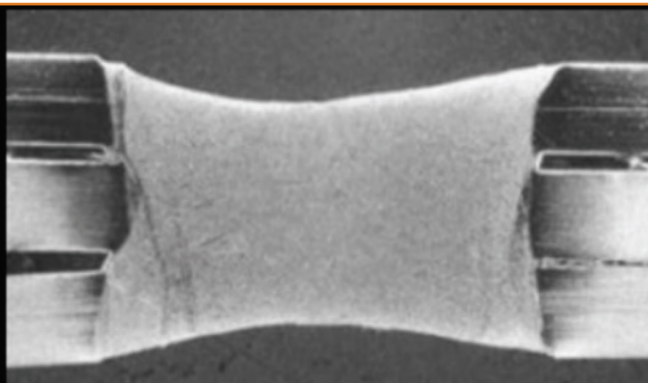
Large
Clearance



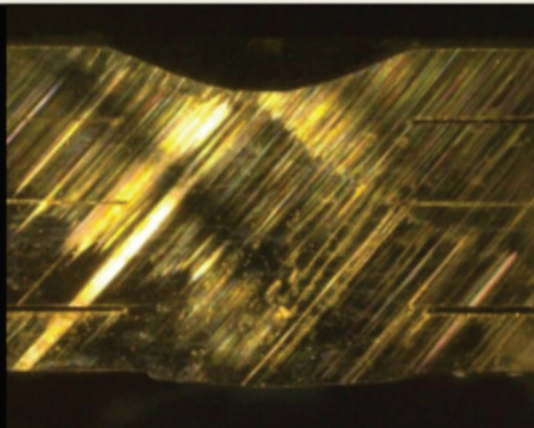
No
Clearance



3 Panels



4 Panels



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Cromax

STANDOX

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In keeping with Toyota's TNGA initiative, laser screw welding is dramatically reducing assembly time, and the length of the production line –

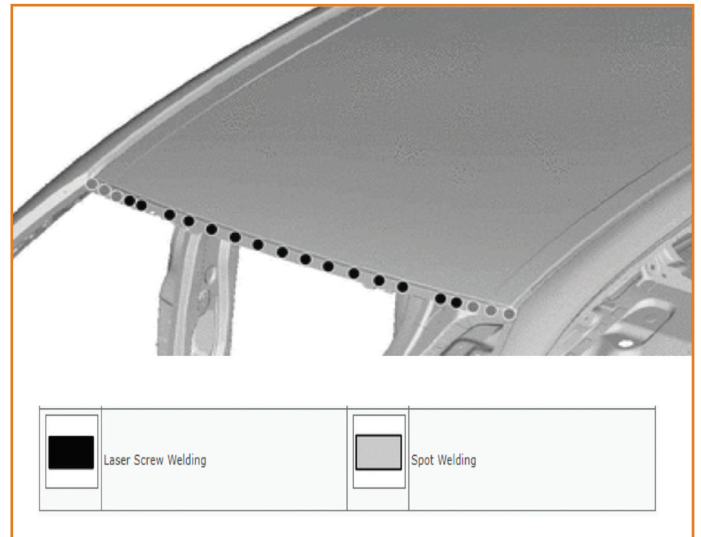
- Individual Laser Screw welds are completed in under **1** second, as compared to **2.5** seconds for a conventional spot weld.
- Auto body production line size / length is expected to decrease by nearly 50%.
- Assembly plant CO2 emissions are expected to decrease by over 50%.

At the same time, overall body rigidity is increased, with better collision performance and lighter weight.

Looking to the future, and other metals, LSW is entirely suitable for joining /welding aluminium parts also.

COURTESY OF TOYOTA BRSM

Laser screw welds are an OEM process only -they cannot be replicated by the collision repair industry. Weld connections for replacement panels utilise either conventional inverter STRSW or MIG plug welds, as appropriate.



For a closer look at how this welding process works, have a look at the short video clip on YouTube (In your own time, of course!!).



These articles have been written by Martyn Lane : I-CAR Instructor, Weld Test Administrator and Technical Specialist to the auto body industry.

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