



# THINK RAILWAYS. THINK JINDAL STAINLESS.

OVER 5 DECADES OF INNOVATIVE STAINLESS STEEL SOLUTIONS



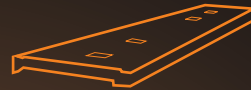
Advisory



Raw Material Supplier



Customization



Fabricated Components



# STATE-OF-THE-ART MATERIALS FOR NEW AGE RAILWAYS



Corrosion  
Resistance



Long-  
Lasting



Lightweight



Higher Fatigue  
Strength



Lower  
Lifecycle  
Cost



Lower Carbon  
Footprint

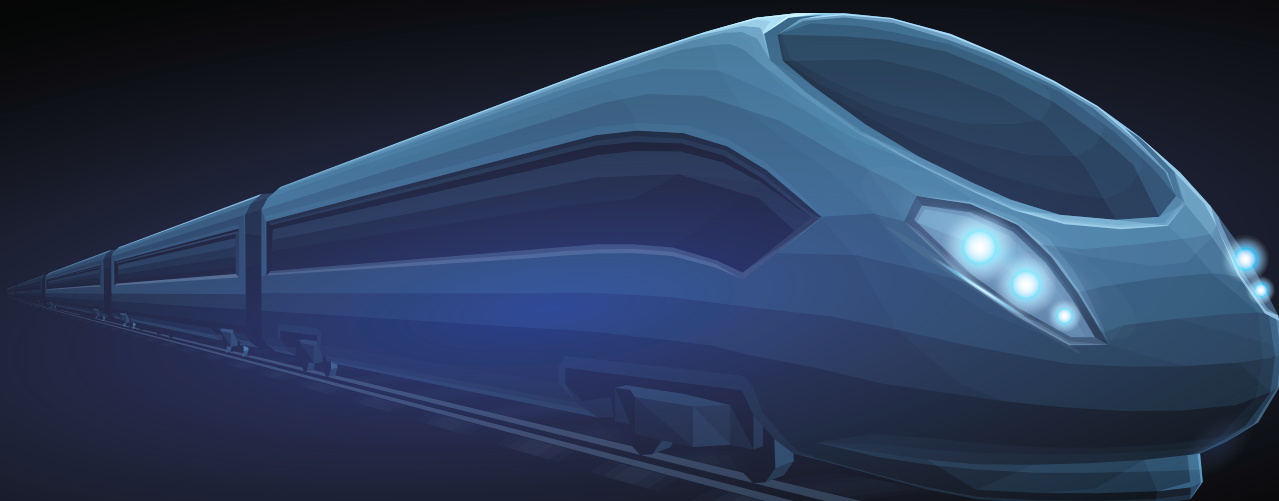
# MATERIAL SPECIFICATIONS

MECHANICAL PROPERTIES					
MATERIAL	Grade of SS	Temper	YS (MPa, min)	UTS (MPa, min)	% Elongation (min)
	SS 201L	½ hard	690	930	22
	SS 301L	½ hard	690	930	20
	SS 2101 (lean duplex)	Hot rolled, annealed and pickled	530	700	30

**Double the strength** of currently used SS Grade

CHEMICAL PROPERTIES											
MATERIAL	Grades	% C (max)	% Mn (max)	% P (max)	% S (max)	% Si (max)	% Cr	% Ni	% Mo	N (ppm)	% Others
	SS 201LN	0.03	6.4-7.5	0.045	0.015	0.75	16.0-17.50	4.0-5.0	-	1000-2500	Cu = 1.0 max
	SS 301LN	0.03	2.00	0.045	0.03	1.0	16.0-18.0	6.0-8.0	-	700-2000	
	SS 2101	0.04	4.0-6.0	0.04	0.03	1.0	21.0-22.0	1.35-1.70	0.1-0.8	2000-2500	Cu = 0.1-0.8

**Tempered austenitic grades** and lean duplex have significantly **higher corrosion resistance** vis-à-vis currently used X2CrNi12





# SUCCESS STORIES

## BOSM WAGONS

### Challenge:

Excessive corrosion & low payload in BOSM wagons

### Jindal Stainless Solutions:

- Proactively identified corrosion-impacted areas & their reasons
- Advised on design, fabrication standards, and right stainless steel grade – IRSM 44 SS
- Proof of concept, approvals and mass production

### Efficient Outcomes:

- Minimal corrosion-induced repair & maintenance
- Increased axle load by 4.68T
- Enhanced payload by 22%
- Lesser tare weight by 2.1T
- Augmented volumetric capacity by 31%
- Increase in life expectancy



## BOGIE FRAMES

### Challenge:

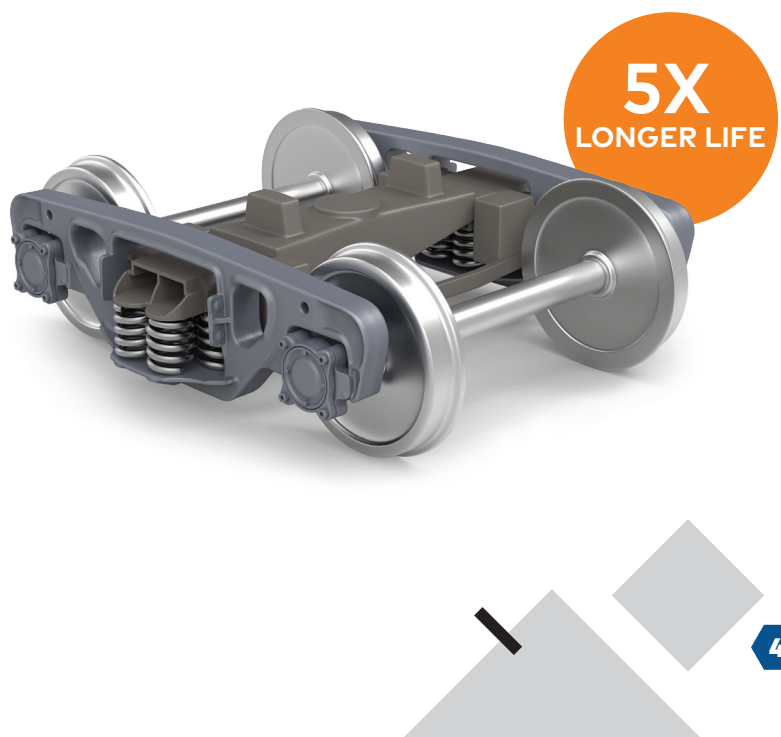
High maintenance and breakdowns due to corrosion

### Jindal Stainless Solutions:

- Lean Duplex SS 201 was proposed for the first time to tackle corrosion in challenging conditions
- Proof of concept through stainless steel miniature bogies for approvals

### Efficient Outcomes:

- Estimated weight reduction of 600kg/coach due to higher yield strength of SS 2101
- No corrosion-induced replacement cost
- Maximum lifecycle cost saving
- Improved energy efficiency



# SUCCESS STORIES

## UNDERFRAMES

### Challenge:

Significant cost arising from corrosion

### Jindal Stainless Solutions:

- Visited repair workshops, identified corrosion-impacted areas and their reasons
- Provided support in design & fabrication of fully functional underframes using SS 201LN as recommended by RDSO
- Developed welding procedure specifications for railways

### Efficient Outcomes:

- Corrosion resistant underframes
- Lightweight and durable
- Superior fire and impact resistance
- Energy-efficient vehicles
- Prolonged life with minimal maintenance

**5X**  
LONGER LIFE





[www.jindalstainless.com](http://www.jindalstainless.com)

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