

Vehicle Teardown And Benchmarking



Objective:

The process of Vehicle Teardown and Benchmarking exercise involves a systematic examination of individual parts of a vehicle to identify the design strategy, material trend, manufacturing process, and compare the vehicle with another.



Summary:

Tata Steel has successfully completed teardown and benchmarking activity with major automotive manufacturers. Teardown activity consists of the following three stages.

01

Pre Tear Down

Sealant and adhesives
Weld analysis
Use of secondary material
Provisions for NVH
Corrosion protection

Pre-tear-down work is done to understand the overall build strategies.

02

Tear Down

Micro-structure
Mechanical testing
Chemical analysis
Coating type and thickness details
Grade identification
Paint thickness

Teardown activity is to understand the design strategy and material usage

03

Analysis & Reporting

Assembly exploded view with tree
Material used
Bill of material
Pre-teardown observations
Section analysis
Material trend analysis

Various reports consist of corresponding parts - bill of materials, welding technique and quantity and section analysis, etc.



Benefits:



Benchmark own product with others



Clear understanding of material trends



Understand the type of coating strategy used for corrosion protection



Learning from best products and practices



Outcome of activity helps is weight and cost reduction

Typical Material Analysis Report

Part Name		Weight (g)	
Part Name		xxx	
BOM No	Part Id	Complete assembly	
yyyy	xxxxx	REAR FLOOR	

Rm [MPa]	Rp0.2 [Mpa]	Agt [%]	At[%]	n value	Hardness [Hv]
yyyy	aaaa	xxx	xxx	xxx	xx

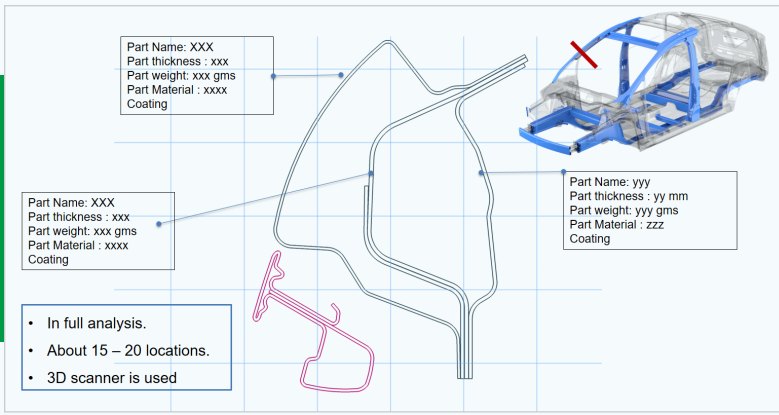
Joining Information		RSW _{total}		2P	3P	4P	GMAW (mm)	Structural Bond (mm)
		78	43	30	5		0	0

Chemical Composition																		
C	Mn	S	P	Si	Al	Cu	Cr	Ni	Mo	V	Nb	Ti	N	B	Ca	Sn	As	Sb

Coating & Plating layer [µm]					
t ₁	t ₂	t ₃	t ₄	t ₅	t ₆
0	11.9	0		-	11.9

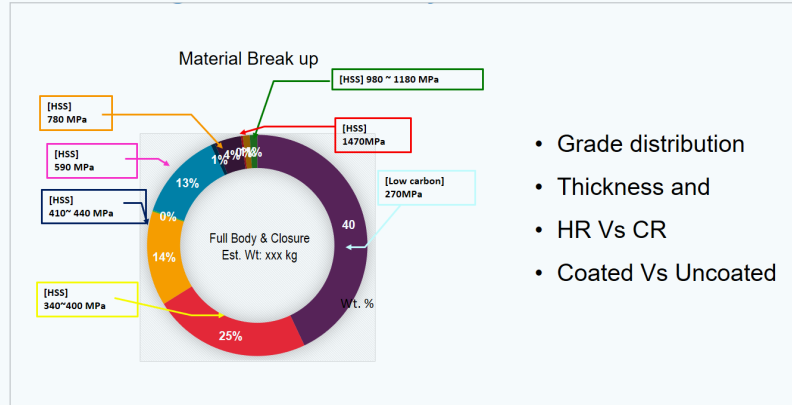
t ₁	t ₂	t ₃	t ₄	t ₅	t ₆
0	23.2	0		-	23.2

Microstructure



Section Analysis Report

Steel Grade Distribution Analyses



250
parts detailed analysis

16 weeks
Duration



80
parts detailed analysis

8 weeks
Duration



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