



The 27th INTERNATIONAL  
ELECTRIC VEHICLE  
SYMPOSIUM & EXHIBITION  
BARCELONA  
17th-20th November 2013



# Crash Design

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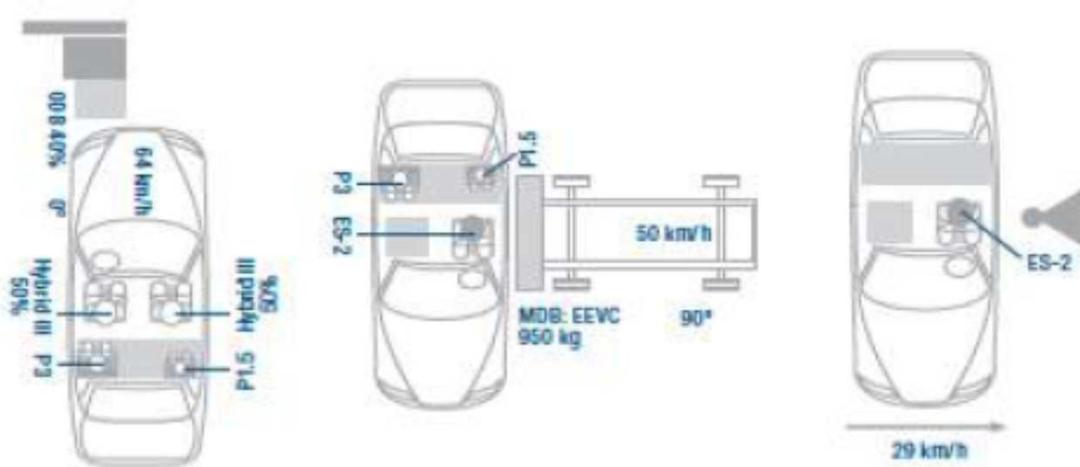
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# Safety Design



In order to increase the safety, e-Light has applied crash criteria and performed crash simulations to increase the safety of the Urban EV design.

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# EV materials

**VEHICLE in ALUMINIUM**

**ALUMINIUM: ELASTIC-PLASTIC MATERIAL**

**E: 67.6 GPa**

**Density: 2.700 Kg/m<sup>3</sup>**

**CURVE: (0, 205 Mpa) (16%, 270 Mpa)**

**MASS: 720 Kg**

**MASS ADDED: 384 Kg**



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**VEHICLE ALUMINIUM & CFRP**

**CARBON FIBER: ELASTIC-PLASTIC MATERIAL**

**E: 78 GPa**

**Density: 1.560 Kg/m<sup>3</sup>**

**CURVE: (0, 497 Mpa) (1%, 499 Mpa)**

**MAXIMUM PLASTIC STRAIN: EPMX 1%**

**MASS: 536,3 Kg**

**MASS ADDED: 361 Kg (Mass added is 23 Kg less,  
by a reduction of battery and engines)**



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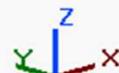
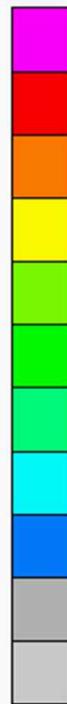


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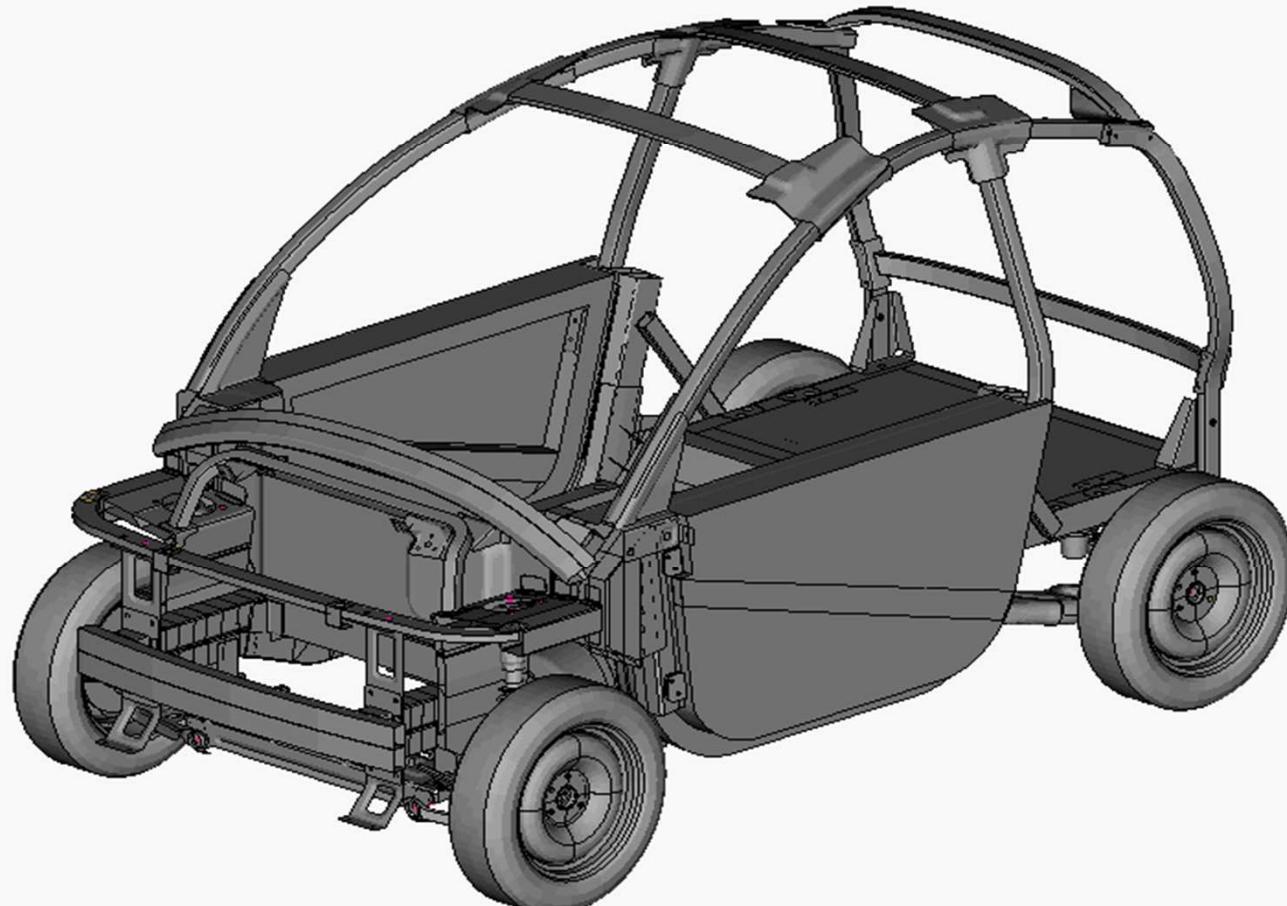
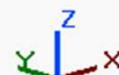
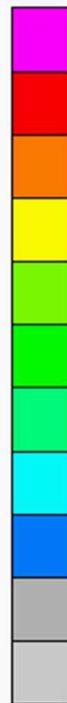


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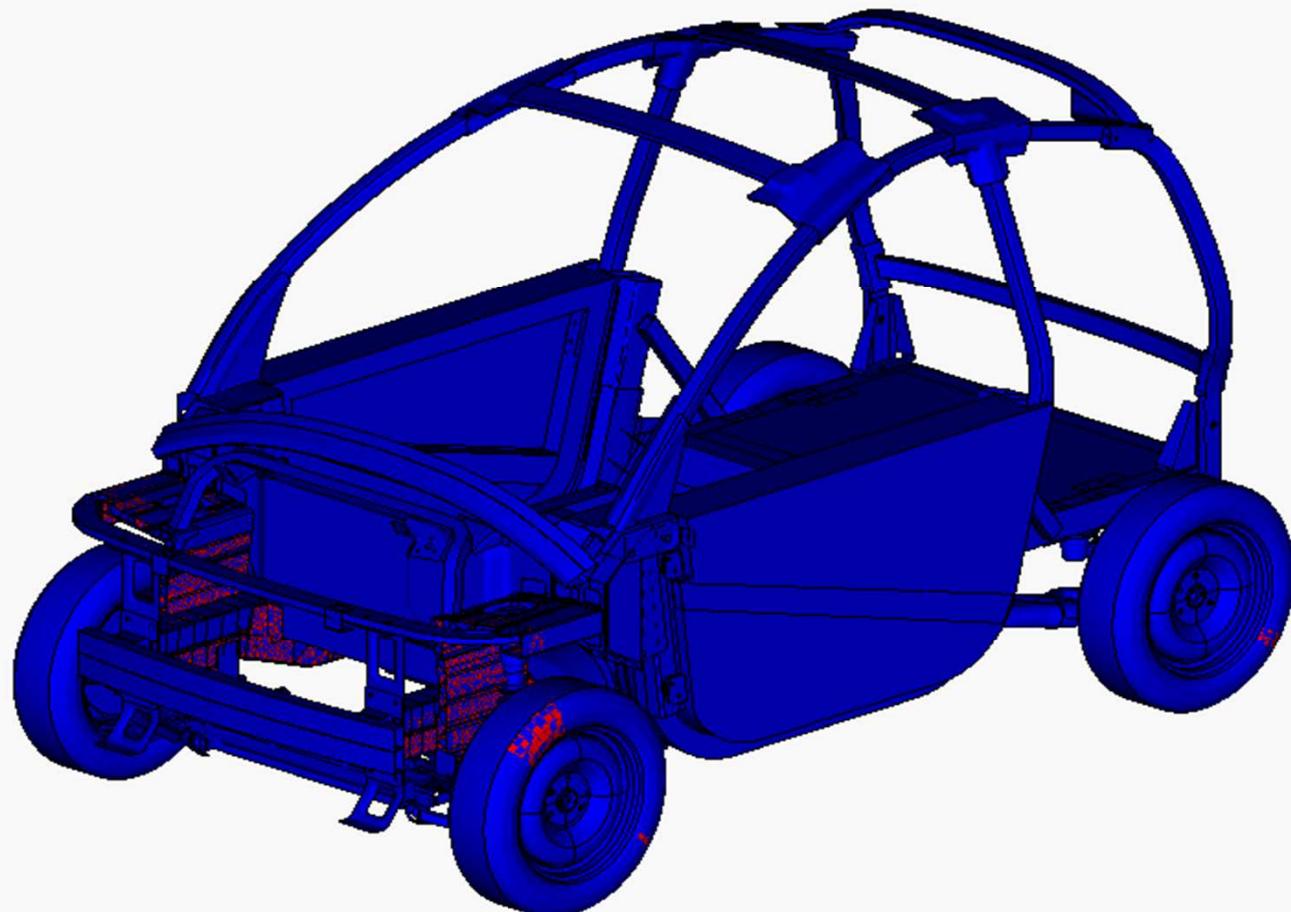


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## Comparison



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HYBRID



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AVERE

weA



EVAAP EDTA

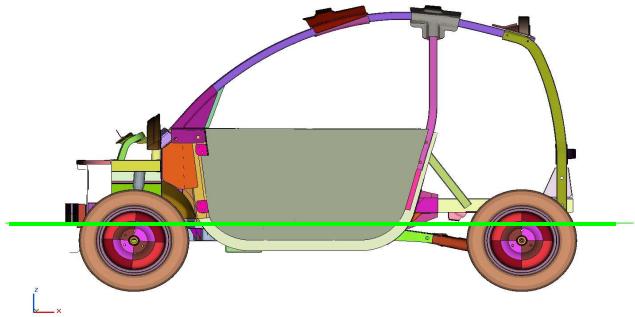


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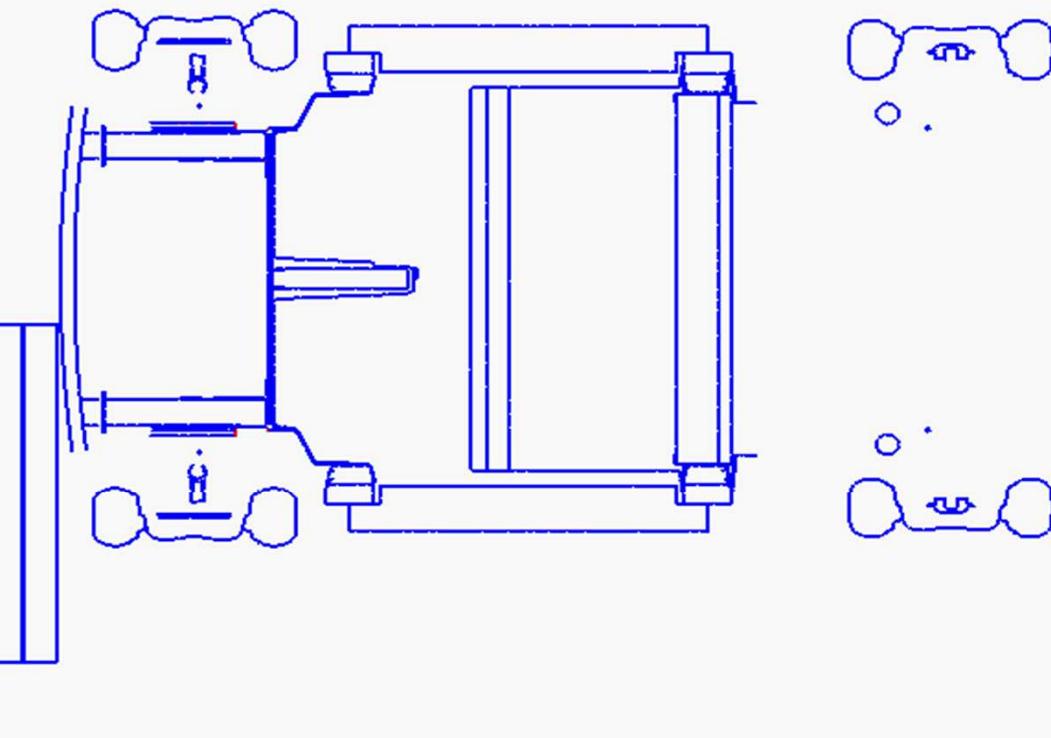
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# Repairability



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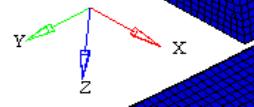
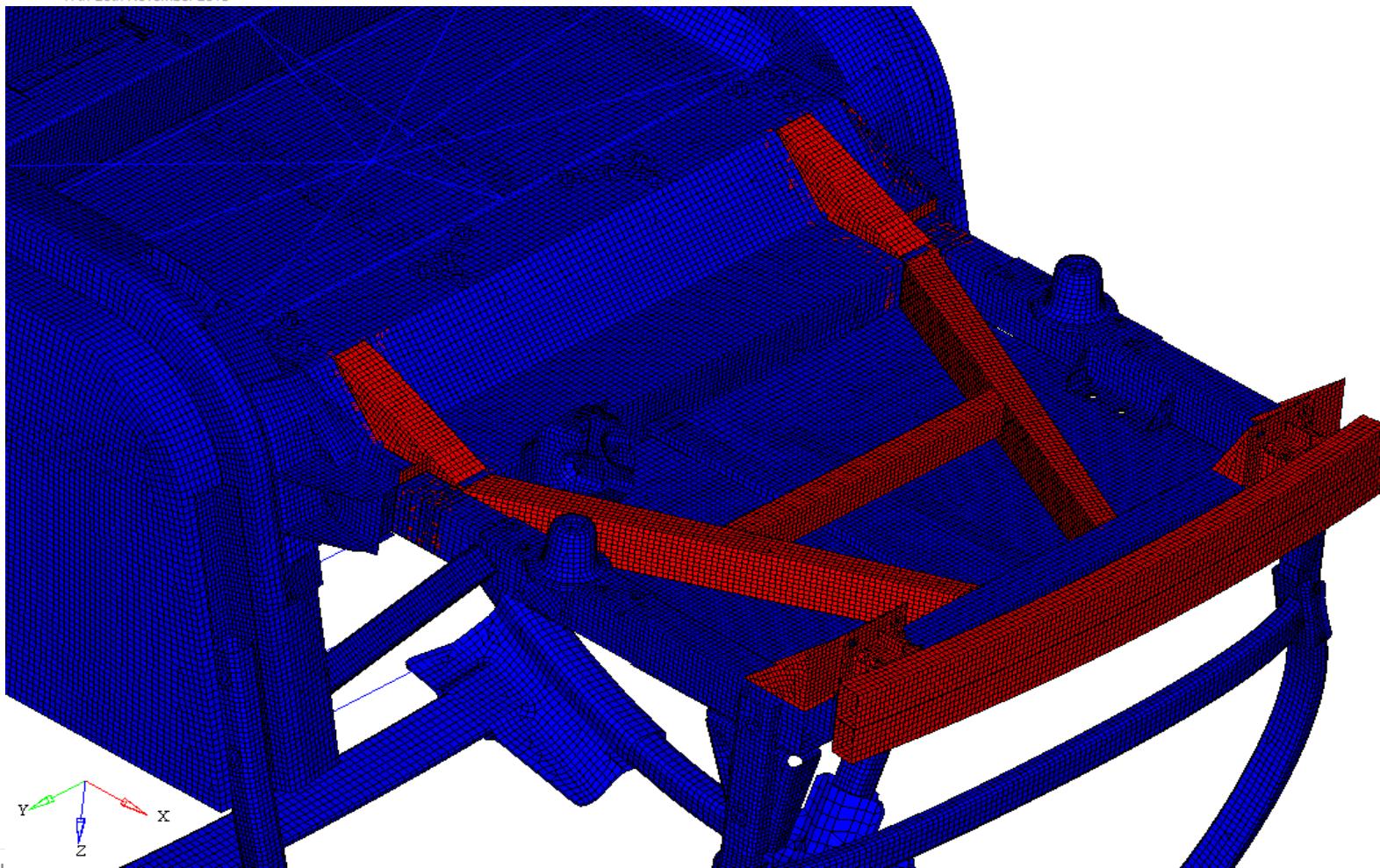
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## Rear design



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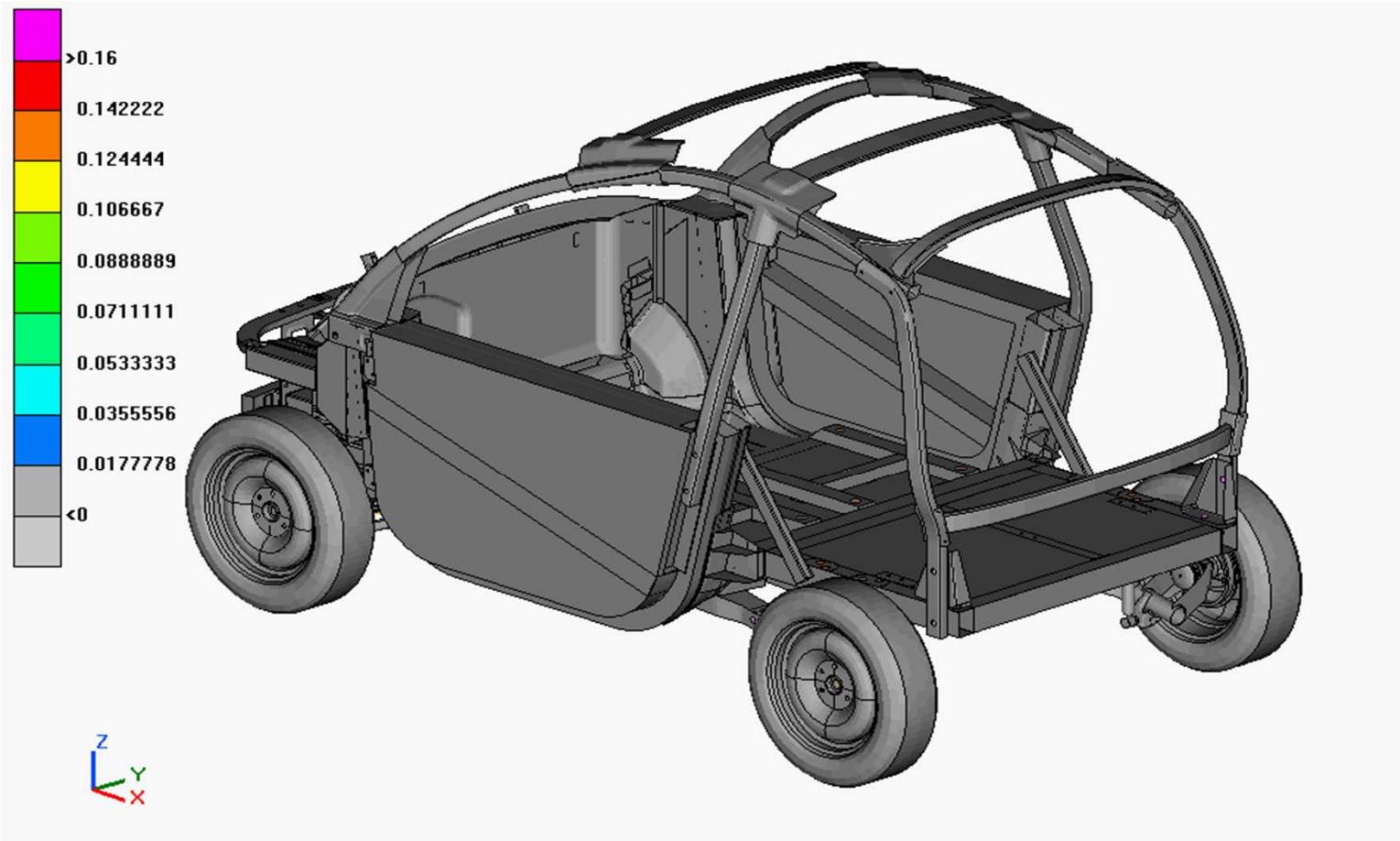
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## Aluminum



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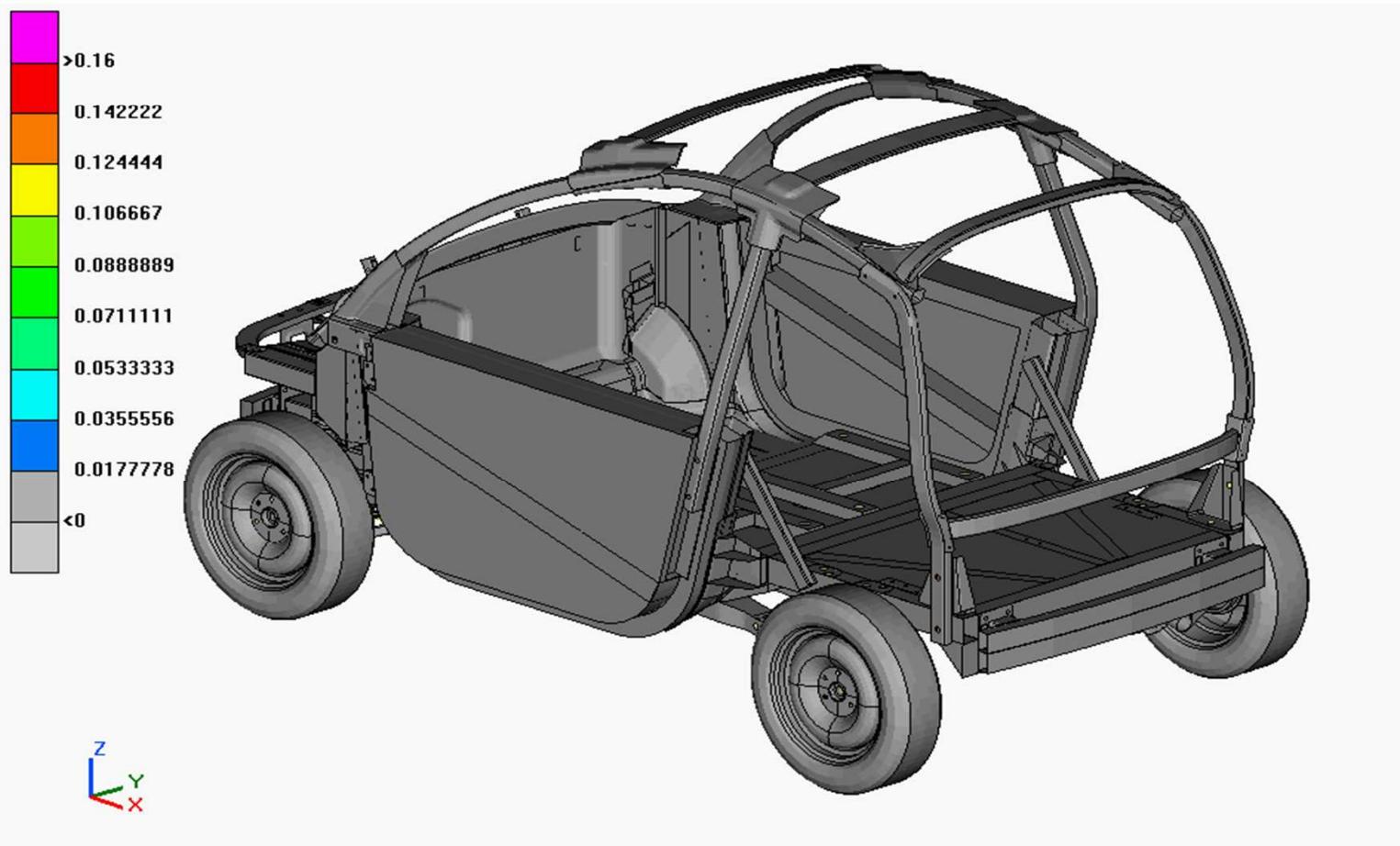


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## Hybrid



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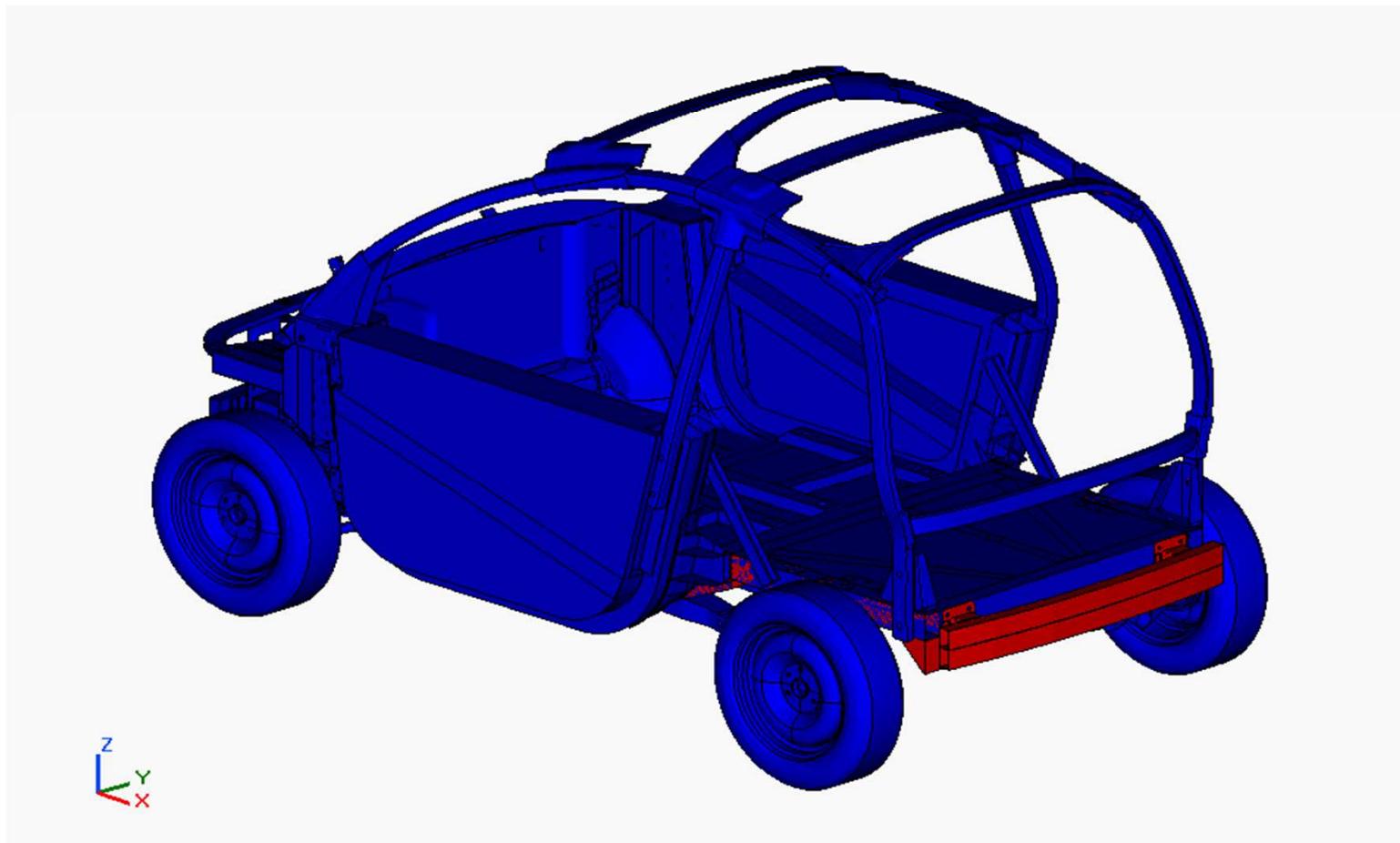
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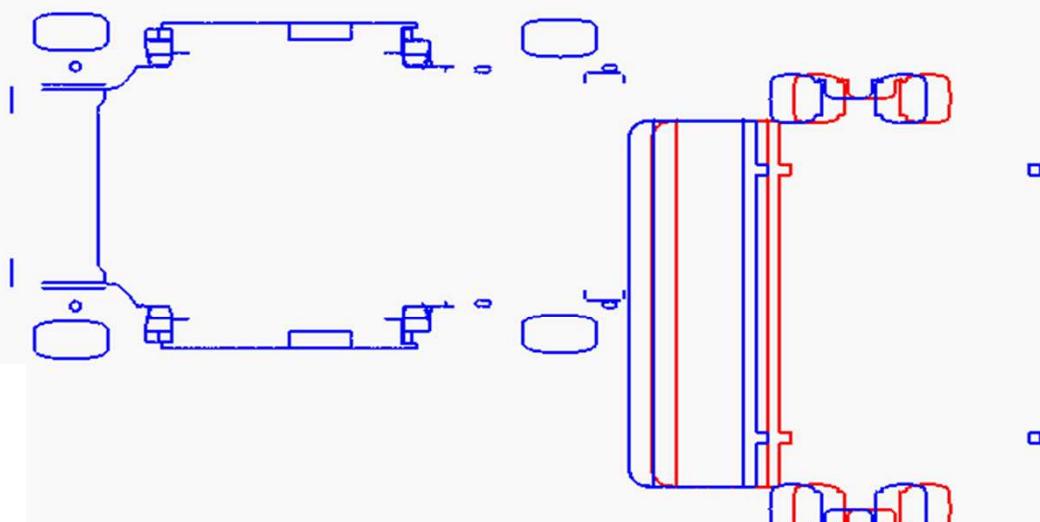
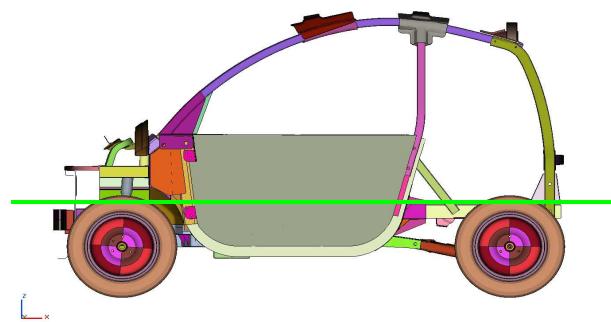
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## Side Aluminum 50 km/h



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## Side Hybrid 50 km/h



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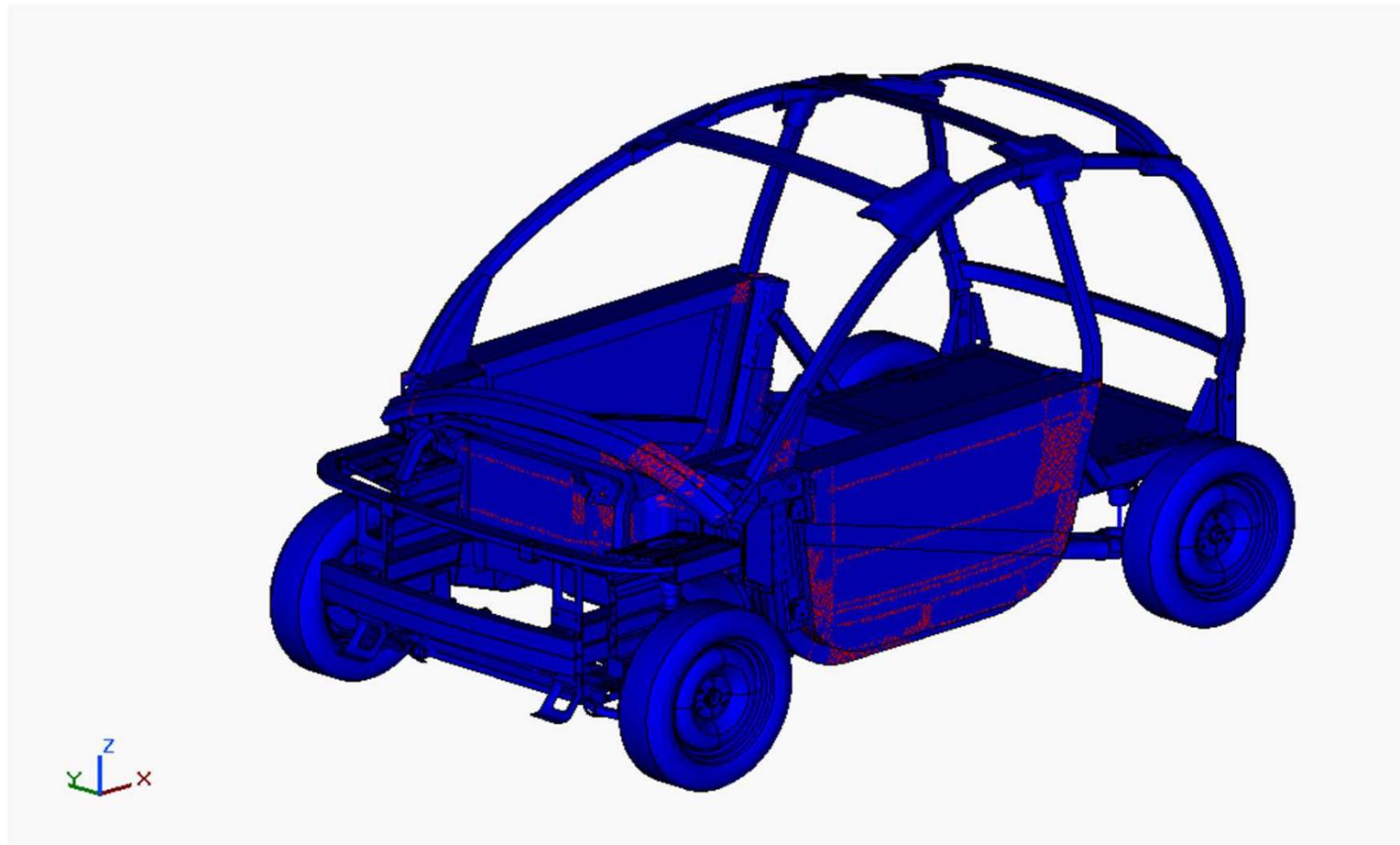
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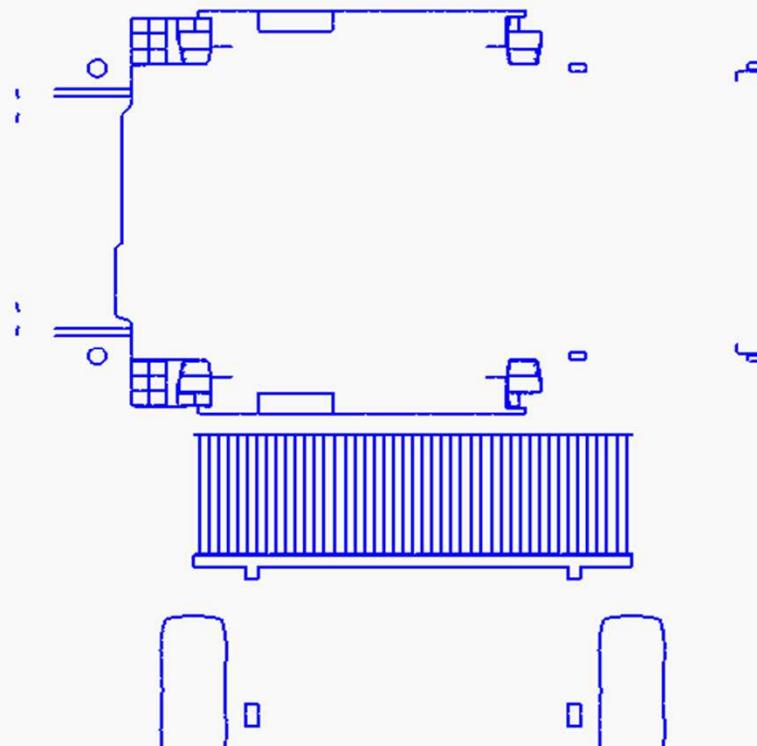
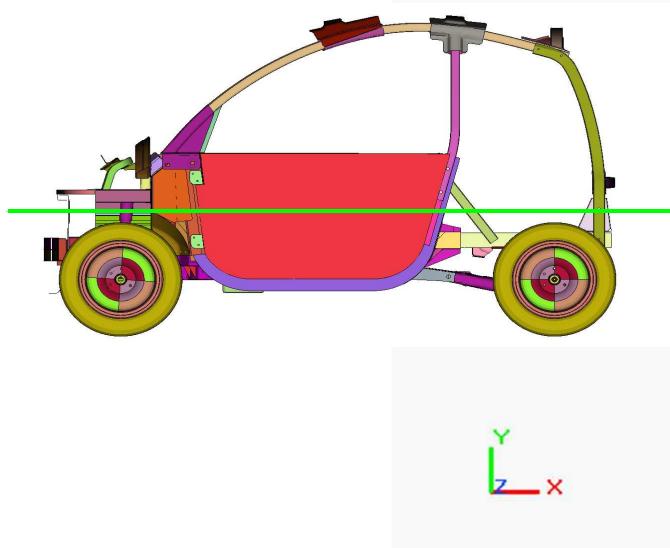
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# Thanks for your attention



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