innovative
enclosure solutions
for industrial & electronic
applications

E.T.A. S.p.A.

F.E.M.
Fine Element Method

Canzo, 9th November 2011

Innovation, sustainability, quality

How to improve the mechanical features of the products, by keeping the quality level high?

Research of new materials: high-resistance sheet steel (HSLA High-strength low-alloy with low percentage of carbon)

High-strength sheet steel

Used for E NUX structure →

A comparison between the cabinet structure and the car structure can be made.

As a matter of fact, HC260LA sheet steel (EN10268) is included in the specifications of many car producers:

- it has optimal mechanical features
- it allows for the reduction of the thickness without modifying the mechanical features
- it ensures a minimum yield point (as raw material already)
- it is suitable for stuctures stressed by shock or efforts

Innovation, sustainability, quality

Finite Element Method (FEM)
to check the resistance

FEM (Finite Element Method)

Definitions

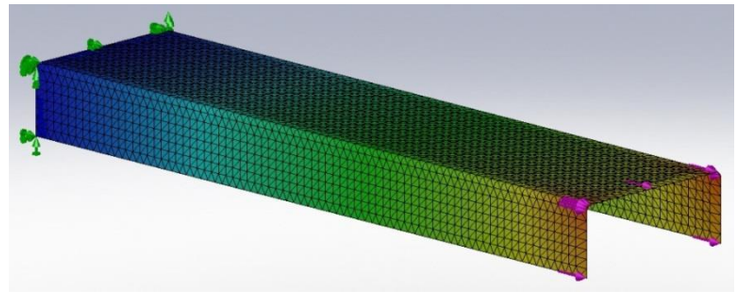
F.E.M. is the acronym for *Finite Element Method* , a numerical technique for finding approximate solutions of partial differential equations as well as integral equations.
The method is to split a “body” into a very large number of small basic elements of particular type (mesh). To each element are applied the elementary equations that define the physical phenomenon studied.
After having assigned loads, constraints and characteristics of the material, our CAD software performs the linear static FEM studies that calculate displacements, reactions forces, strains and stresses.

FEM (Finite Element Method)

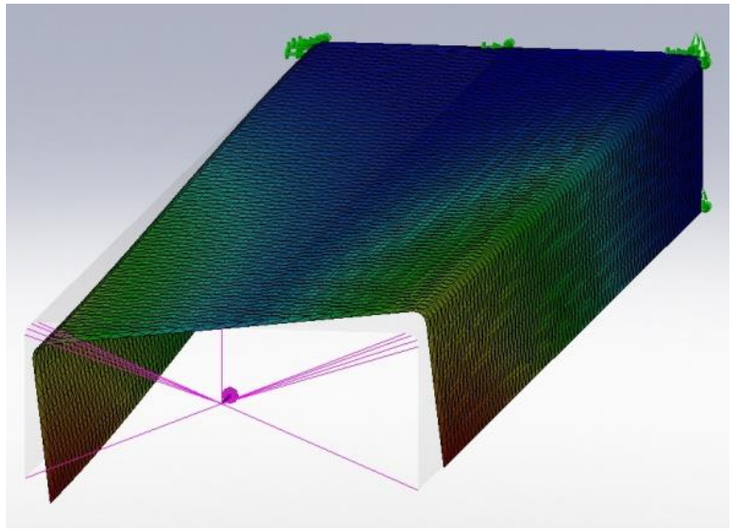
Data supporting the choice of high-strength material for ENUX

	PULLING	TWISTING	BENDING
1,5mm thickness Standard mild steel	950N	11,5N*m	650 N
1,2mm thickness High-strength sheet steel	1.250N	15 N*m	820 N

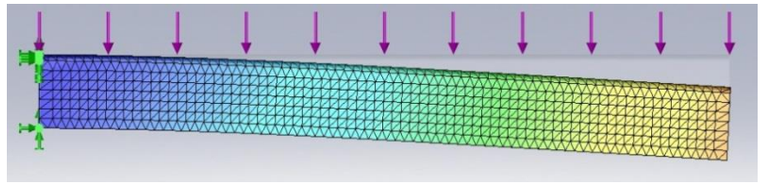
PULLING



TWISTING



BENDING



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