

## ABSTRACT

The concerns of the motor vehicles constructors for the safety of their occupants are increasing every day. If this theme, up to a very recent period, was only addressed by the light vehicles constructors, it is now becoming more relevant to the buses constructors.

The passengers' safety is crucial but it should not lead to bigger thickness of the materials to be in accordance to the ruling legislation, it should rather call on studies that aim at optimizing the structures and/or introducing new materials.

In this context, the main objective of this work is to improve the comprehension of the static behaviour of the several typologies of tubular structures that can be applied to the buses bodywork. Some values related to the stress concentration factors according to the several studied tubular geometries were also found and they were subjected to loadings: axial, in-plane bending and torsion. These merely indicative values illustrate the magnitude of the critical stresses in the joints. A study concerning the effect of the length profiles on  $K_t$  values was also carried out, and it was observed that the bigger the chord length, for a constant value of the brace, the bigger the factor of the stresses concentration and that it suffers no changes in the value of the length of the brace. Finally, a comparative study between the several materials was carried out and it was confirmed that the substitution of the traditional St 37 for a high resistant steel (Docol 1000) increased the mechanical resistance of the tubular structure in 65.5%.