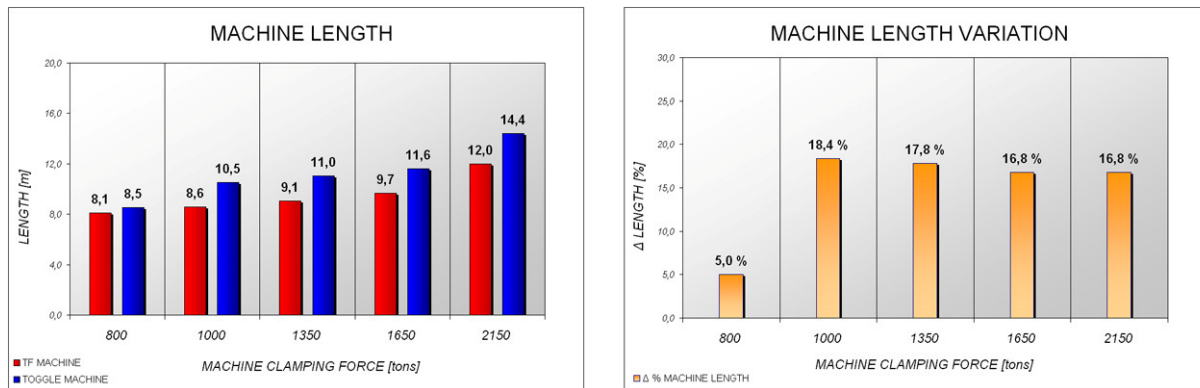


3. CASE STUDIES

Considering that space is an important asset, another advantage represented by the *TF* machine is an overall dimensions reduction, even maintaining the same toggle machine die height:



a)

b)

Fig. 16: machines length and lengths variation.

The following images refer to an industrial light produced by *I.S.P.A Group* in “as cast” conditions, by using a *TF 1000* machine. For this kind of components the surface finishing is essential in order to ease the trimming operation and guarantee the optimum adhesion of coating paints.

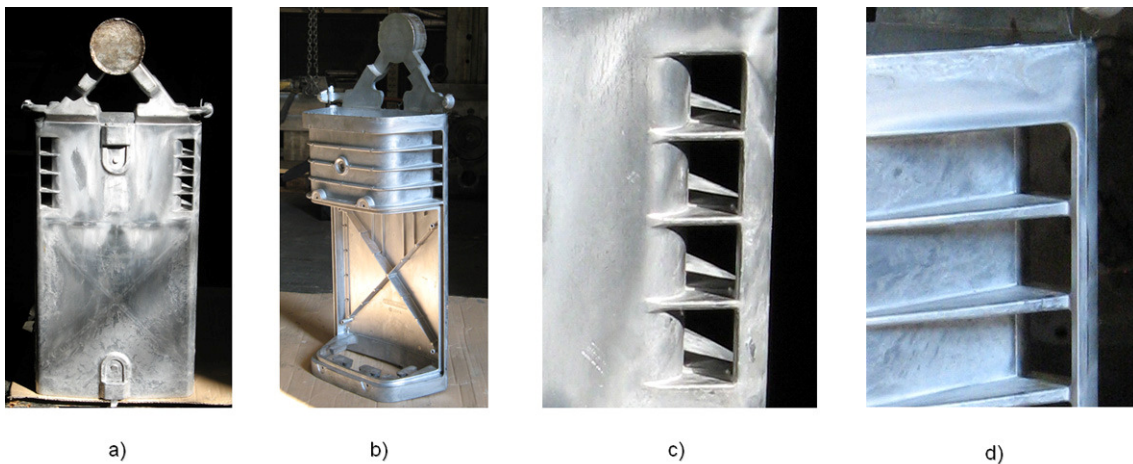
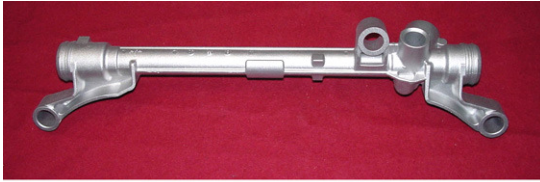


Fig. 17: industrial light. Average dimensions 400mm x 800mm, weight 8 kilos.

As the details clearly show (Fig. 17c, Fig. 17d), in correspondence of the critical features there is no flash formation, neither along the die separation line.

A similar situation is met considering the following casting: a steering box produced by *P.F.B.* using a *TF 1250* machine. These pieces have to respect very strict quality standards: being a structural component used in automotive industry, their performance has to be absolutely reliable in order to guarantee the human safety of vehicle drivers and passengers. For this reason, all tests are subject to be extremely severe (e.g. fatigue tests, bursting strength tests).



a)



b)

Fig. 18: steering box. Average dimensions 660mm x 170mm, weight 3 kilos.

In this case, the flashes are dangerous because it means that in such zones the correct design wall section thickness is not guaranteed: it should be kept in mind that the average scraps quantity in foundry has to be lower than 3% of whole production, whilst concerning with delivered batches this figure falls to 1%. The *TF* machine is able to assure the respect of these strict values, as well as a productivity increasing if compared with a toggle machine (the average production rate is 72 pieces per hour).

Moreover, the better die closing also means more safety towards such die elements as core pins slides.

4. CONCLUSIONS

In order to talk about “innovation”, all researches and theories studied during the developing of a new project have to be confirmed on field. It is a well-known fact that the foundry environment consists of severe working conditions. Despite of this, the practical experience has shown that the two platen machine, so called *TF*, is suitable for this kind of conditions.

First of all, during the working cycle, the *TF* machine shows a better adaptation capacity to the die deformations. The consequence of developing the clamping force directly on the tie bars, by using four independent block cylinders, is represented by a more uniform stress distribution: this means a longer durability of mechanical components, because of their correct functioning in accordance with the design specifications.

The great diminution of parts subject to relative friction (e.g. rods, pins and bushes) translates into less wear and less lubrication need, as well as less maintenance: the *TF* prototype produced by *Italpresse Industrie* had being stopped only for about two weeks during the last three years, to go through ordinary maintenance.

The smaller overall dimensions, together with a larger machine opening, are a synonymous of space-saving and access facilitation.

Another important aspect when introducing a new technology, is that it has to be user-friendly, in the sense that passing from a system to another has not to be impacting. From this point of view, the *TF* functioning is absolutely simple, thanks to the elevated automation level: all process parameters are kept under control by the PLC system, and the operator is constantly informed about the current situation. Moreover, the advanced Profibus and profisafe technology guarantees the safety procedures running.

With reference to these considerations, it is possible to state that the innovative *TF* machine represents an answer to the increasing request of die-casting process improvements.