

TANGRAM is an open-source software designed by the Costamp Group, enabling us to apply the principles of PuzzleDie® in our day-to-day work. It is simple to use and creates rapid simulations, making it a revolutionary tool in the die manufacturing market.

For more information:
info@costampgroup.it

Costamp headquarter

Costamp began in 1968 as a small family business. It has evolved, developed, and purchased other companies over the years.

PuzzleDie®

Research and development for the PuzzleDie® project are based at our headquarters in Sirone in the province of Lecco.



Via Verdi, 6 - 23844 Sirone (LC)
T. (+39) 031 875195
F. (+39) 031 875196
info@costampgroup.it





+ THE SOLUTION

We seek and deliver revolutionary design methods. We can predict the future performance of each die and create different configurations to extend its lifetime. At Costamp, the future is called PuzzleDie®.

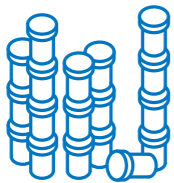
PuzzleDie® is a **new approach** to manufacturing dies, created through collaboration between the various departments of the Costamp Team: designers, simulation experts and foundry operators. This wealth of experience has transformed ideas and requirements into a **dedicated FEM** to simulate the stress a die undergoes during its lifetime.

OVERVIEW

+ THE CHALLENGE

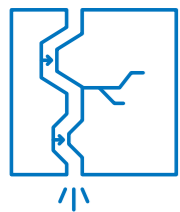
PRODUCTION

A single die, depending on its geometry, can produce **several thousand parts per day**.



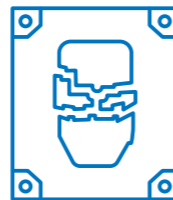
WEAR

Heat and mechanical fatigue have an impact on the long-term resistance of the die. During its life cycle, alternate traction and compression forces can cause cracks and breaks.



METHOD

We've devised a **solution** which can work either for **small areas of wear** or for the **entire die**. Identifying the fracture lines, we divide the die into smaller interchangeable parts which are more resistant and long-lasting.



OBSTACLE

There are **very few specific software applications** able to **simulate the stress** that a die undergoes. It is a complicated process requiring the input of a large amount of data and specialist operators, involving high costs to obtain results and long timescales.



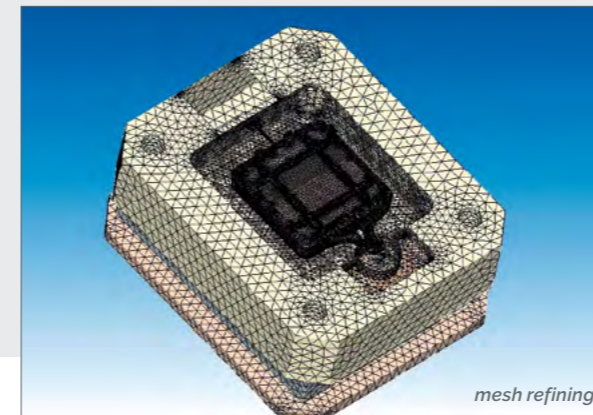
USER-FRIENDLY

Boundary conditions

The software is able to **automatically determine the boundary, geometric, mechanical and thermal conditions** for the simulation, relieving the operator from the burden of laborious data entry. This avoids data entry errors, obtaining more precise results.

Mesh refining

In the same way, the system **autonomously defines the level of mesh refine**. Where the thermal gradients require it, the size of the mesh is reduced (down to tens of millimetres). In areas of lower temperature gradient, larger mesh parts are used to optimize calculation times.



mesh refining



DEDICATED TO HPDC

In collaboration with the Politecnico di Milano University, a **dedicated algorithm** has been created to calculate **thermal and mechanical fatigue factor** in die casting. It is now possible to represent, in a clear and understandable way, the stress that a die undergoes in each operating cycle.



EFFECTIVE

The **life of the die can be extended up to three times**. Maintenance is reduced and made simpler. Different materials can be used in the same die to create more specific, detailed inserts.

