# DSM DIE SPLITTING MACHINE®

## Tired to use chisel and hammer?

The DSM DIE SPLITTING MACHINE® was born for you a few years ago. This equipment was designed and produced in response to the continuing demands from aluminium extruders' die-shops in order to speed up operations and separate porthole dies safely and without any noise. The traditional splitting of porthole dies takes place by using manual and rudimental systems, by inserting a chisel in the groove between die and mandrel and by hitting with a hammer or a similar tool. In order to have correct hand separations often two operators are needed, because it is important that, at the moment of separation, die and mandrel separate axially until they are completely detached.
The introduction of DSM DIE SPLITTING MACHINE® on the contrary involves only one operator.

Compes splitting system takes advantage of the groove which is present in all porthole dies. Die and mandrel are separated thanks to the strength applied by special elliptical tools, shaped and sized on purpose in order to adapt to the different groove patterns.
These tools have the function to centre and block the piece. The strength which is necessary to split is self-adjusting and progressive, distributed in a uniform way on the three tools and discharged axially.
The die loading starts by laying the piece on the rolling table, so as to reduce to the minimum the efforts of the operator. Upon request it is possible to design and develop an automatic system for die loading and unloading, instead of hand operations.

DSM DIE SPLITTING MACHINE®'s cycle is fully automatic, but all the same it is possible to intervene manually in each step.
The ideal lay-out of the DSM in the production cycle is immediately after soda treatment and before sand blasting and access to the correction department.
Risks and disadvantages coming from hand separation are many:

1) Danger of injury for operators due at least to three possible reasons:
   a) improper use of chisel and hammer, which can lead to serious hand and fingers crushing;
   b) detachment of steel chips and flakes, particularly when the dies to be separated have undergone several nitriding processes;
   c) splashes of soda residues, which might remain within screw and pin holes.

2) Impossibility to apply symmetrical radial force at the same time can cause seizing of the mating diameters if they are extremely precise: even the slightest variation of inclination between the parts to be separated could irreparably damage the mating surfaces and thus the life of the portholes.
3) The need to use two workers, above all in presence of dies with diameter exceeding 300 mm.
4) The opening force that is dependent on the muscle power of the workers.
5) Vibrations caused by hammering could break the mandrel when it is very small.
6) The life of the die can be jeopardized because, during separation, the bearings of the mandrel and die could come into contact and be irreparably damaged.
7) Opening can take a very long time, particularly in case of dies that have been deformed during the extrusion process.

The use of the DSM DIE SPLITTING MACHINE® has the obvious advantage of eliminating all these hazards, difficulties and costs, combining ease of use with safety and the elimination of noise pollution.

# DSM DIE SPLITTING MACHINE®:OPERATING INSTRUCTIONS

**The following operations are valid to separate porthole dies.**

- Place the die with the mandrel surface resting on the roller belts.
- Center the die on the movable table, by hand or, on request, by an automatic arm.
- Position the pointer by hand on the die groove and take the measurement necessary for automatic correct positioning of the die with respect to the elliptical tools.
- Press the start button to begin the fully automatic cycle:

1) the protection casing descends.
2) the movable table rises and brings the die groove to the elliptical tools.
3) the tools start to rotate, proceeding in sequence to perform automatic centering, detaching the die from the mandrel and blocking the die at the top .
4) The movable table descends to complete separation of the mandrel that can then be taken off the machine by hand or through the optional automatic arm.
5) the movable table ascends just enough to sustain the die that is thus released by the elliptical tools.
6) the die is deposited and moves toward the exit with the same procedure used for the mandrel.

| TECHNICAL SPECIFICATIONS FOR STANDARD DSM DIE SPLITTING MACHINE® | | |
|---|---|---|
| | DSM 420 | DSM 530 |
| Power installed | 3 KW | 3 KW |
| Hydraulic unit | 100 litres | 100 litres |
| Hydraulic pump | 6+20 litres | 6+20 litres |
| Maximum pressure | 160 bar | 160 bar |
| Actuator with maximum torque | 1800 Kgm | 1800 Kgm or higher upon request |
| Elliptical tools for dies separation | Ø 180-420 | Ø 180-530 |

Structure in welded, tempered tubular steel.
Movable platform with spheres for centering.
Rollers for loading and unloading.
Dimension detector for die centering.
Low voltage electric equipment controlled by PLC in a cabinet integrated with the machine.
Push-button check panel positioned at ideal height, including view panel
Protection with casing in aluminum profiles and PVC GLASS with pneumatic movement.
Optional automatic conveyor-arm, ideal for movement of all dies and essential for those with high diameter.
Rebound-proof device, installed in the middle of the elliptical tools, destined to create a contrast counterbalance limiting the rapid die splitting with spring separation effect.
4 possibilities of die loading and unloading, two from right and two from left.
Sensor suitable to intercept the die non-separation and to prevent its accidental fall.

**NB: In order to take full advantage of DSM, COMPES specifications are to be followed for coupling diameters, opening grooves and pins, as per drawing supplied upon request.**
The machine is supplied in compliance with CE standards.

DSM DIE SPLITTING MACHINE®: a CO.M.P.ES. S.p.A. patent.


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