

Unique Automatic Die Systems

ALSO
FOR RETROFITTING
EXISTING DIES

Standard:

1. “Thermal Bolts” – operating range of bolts: 500 μm (+/- 250 μm)

Actuators: steel bolts with heating cartridges, operating range 300 μm + manual adjustment

Partition of actuators: 30 mm or 25,4 mm (1”)

Perfect system for automatic die adjustment in order to get a flat thickness profile, controlled by modern thickness gauges enabled to control automatic dies

Sophisticated execution:

2. System FRAD (Full Range Automatic Die) - operating range: 2 mm !

System for automatic die adjustment in order to get a flat thickness profile + electronically gap changing: automatically adjusting a new gap with flex-lip without standstill, controlled by SBI thickness.

Actuators: steel bolts with heating cartridges + wedge profile driven by electric motor

Operating range 2 mm + manual adjustment

Partition of actuators: 30 mm or 25,4 mm (1”)

Innovative execution:

3. System “expansion elements” - operating range: 700 μm (+/- 350 μm)

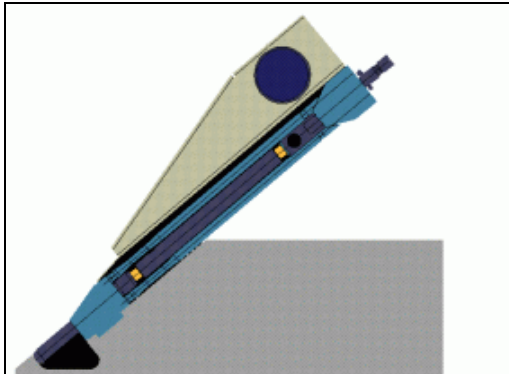
Actuators: differential-elements (special Al-Alloy) thermal expansion by energy transmission on the basis of peltier elements (thermoelectric coolers)

Operating range 700 μm + manual adjustment

Partition of actuators: 40 mm



1. Thermal bolts



Automatic flat dies with thermal bolts

Thermal bolts utilizes thermal expansion of steel bolts

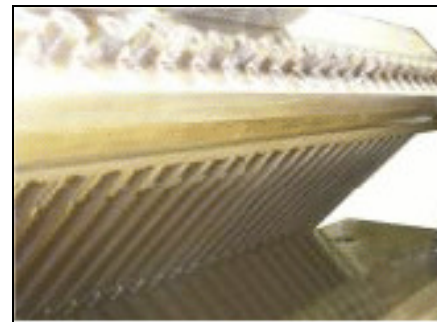
Bolts are heated with heating cartridges and chilled with air (external ventilation)

Consisting of:

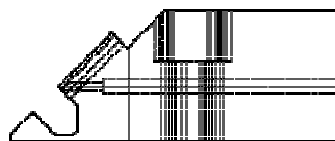
- Thermal bolts with heating cartridges
- Casing with connection for ventilation
- Blower (ventilator)

Technical data's:

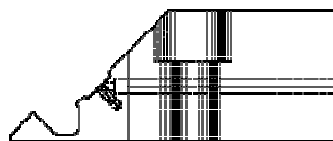
- Push only elements
- Operating range: 300 μ m
- Partition: 30mm or 25.4 mm (1")
- Heating cartridges, rated power: 80 W
- Mechanical fine tuning with fine thread (0,5 mm/rev.)
- Thermal separation to extrusion die (thermal brakes)



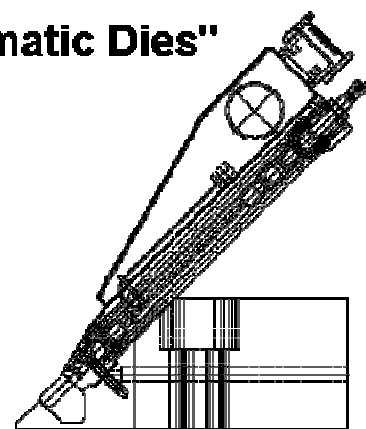
Upgrading Manual Dies to "Automatic Dies"



original



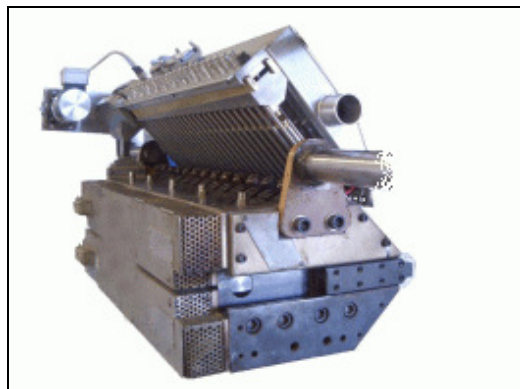
prepared



thermal bolts system attached

2. System FRAD (Full Range Automatic Die)

Automatic die adjustment with gap adjustment: thermal bolts + mechanically, electromotive driven wedge adjustment



FRAD is a combination of two adjustment systems:

- Mechanic adjustment of all thermal bolts with a wedge system
- Thermal bolts utilizing thermal expansion of steel bolts

Bolts are heated with heating cartridges and chilled with air (external ventilation)

Consisting of

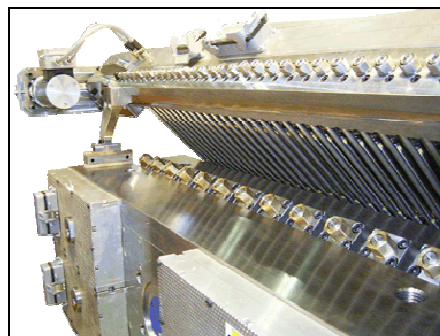
- Mechanic adjustment with a driven wedge system, driven with electric motor
- Thermal bolts with heating cartridges
- Casing with connection for ventilation
- Fan

Technical data's mechanical adjustment system:

- Push only
- Operating range: 2 mm
- Drive: asynchronous motor with gearbox and position measuring system

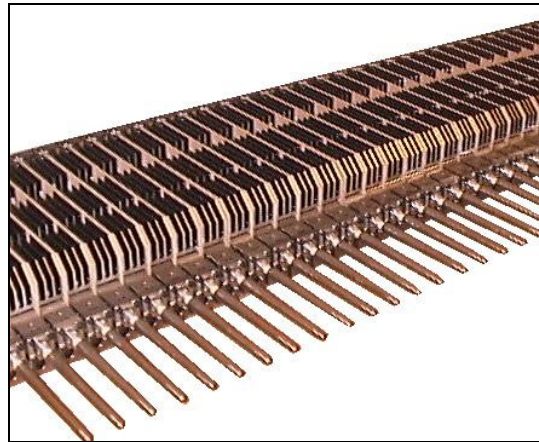
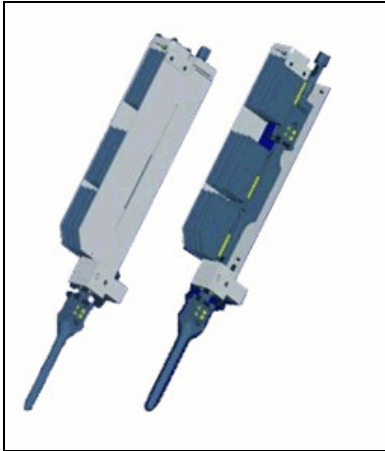
Technical Data's:

- Push only elements
- Operating range: 300 μ m
- Partition: 30mm
- Heating cartridges, rated power: 80 W
- Mechanical fine tuning with fine thread (0,5 mm/rev.)
- Thermal separation to extrusion dies (thermal brakes)



3. System “expansion elements”:

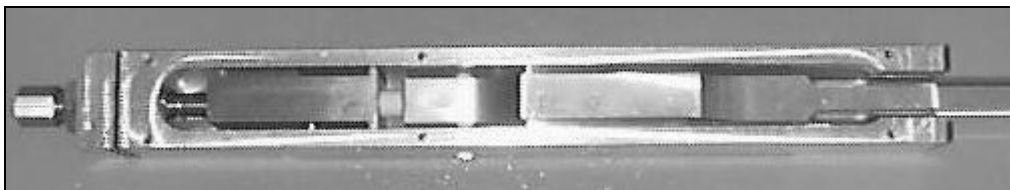
Quick system with expansion elements with an operating range of +/- 350 µm



SBI expansion elements (without heating cartridges) for automatic dies
The system is based on the thermal expansion bolts by means of Peltier elements.
The expansion elements are made of a special Al-alloy which are differential elements and which are controlled contrary: one part of the element expands, the other part contracts. Heat exchange is controlled via energy optimised solid state heat pump elements (TEC's, thermoelectric coolers).

The differential element:

One part of the element expands, the other part contracts and vice versa.



One (the outer) part like a U is connected with the die body - on its open legs. The second part - a bar inside the U - pushes against die lip.

Both parts reduce or extend its length according to its temperature. Related to the system - both parts are heated and cooled (controlled) via solid states heat pumps – always one part is heated with the energy in the other part. Always when on part is heated the other is chilled down. The energy transfer is related to the voltage on the solid state heat pumps.

The overall length of expansion elements is related to the temperature differences of its parts. For thickness profile control of automatic dies this temperature difference is controlled.

Characteristics of expansion elements:

Operates flexlips in a range of 700 micron.

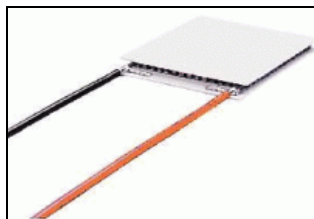
Closed-loop control circuit (changes in length happen exactly without overshoots)

Quick control

Operate from starting position in both directions (starting position = position of pre-adjustment)

No heating cartridges – very low power consumption

Solid state heat pumps:



Thermoelectric coolers (TECs) are solid state heat pumps that utilise the Peltier effect. During operation, DC current flows through the TEC causing heat to be transferred from one side of the TEC to the other, creating a cold and hot side. A single-stage TEC can achieve temperature differences up to 70°C, or can transfer heat at a rate of 125 W.

Characteristic of Solid state heat pumps:

Quick heat exchange
Economically
Low space consumption, less weight
Reliable semiconductor technology
Precise temperature controlling
DC technology
Chilling and heating by inversion of voltage

The automatic system consists of:

- Expansion elements
- Partition: 40 mm
- Expansion element controllers
- Installation in the control cabinet of the thickness gauge
- 10m cable connection extrusion die –control cabinet
- Dust casing with connections for ventilation
- Fan

Technical data expansion element:

- Operating range: 700µm
- Width: 40mm
- Power consumption at 0µm extension: 0W
- Power consumption at max. extension: 75W
- Mechanical fine adjusting with fine thread (0,5mm/revolution)
- Thermal breaks to the extrusion die
- Closed temperature control loop

