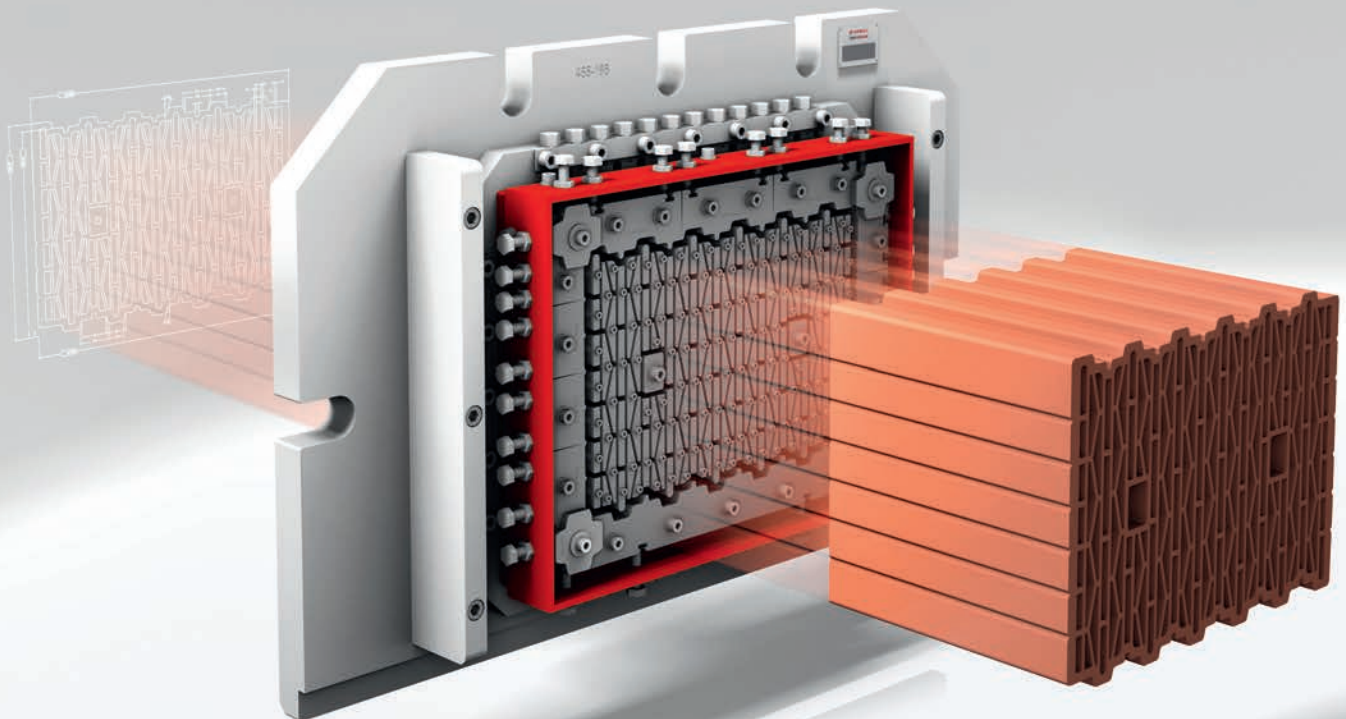


Quality Tools
for the Ceramic Industry

Extrusion Dies



Anatomy of a ZMB BRAUN Die VARIO-TEC / B-TEC / MODUL-TEC

02

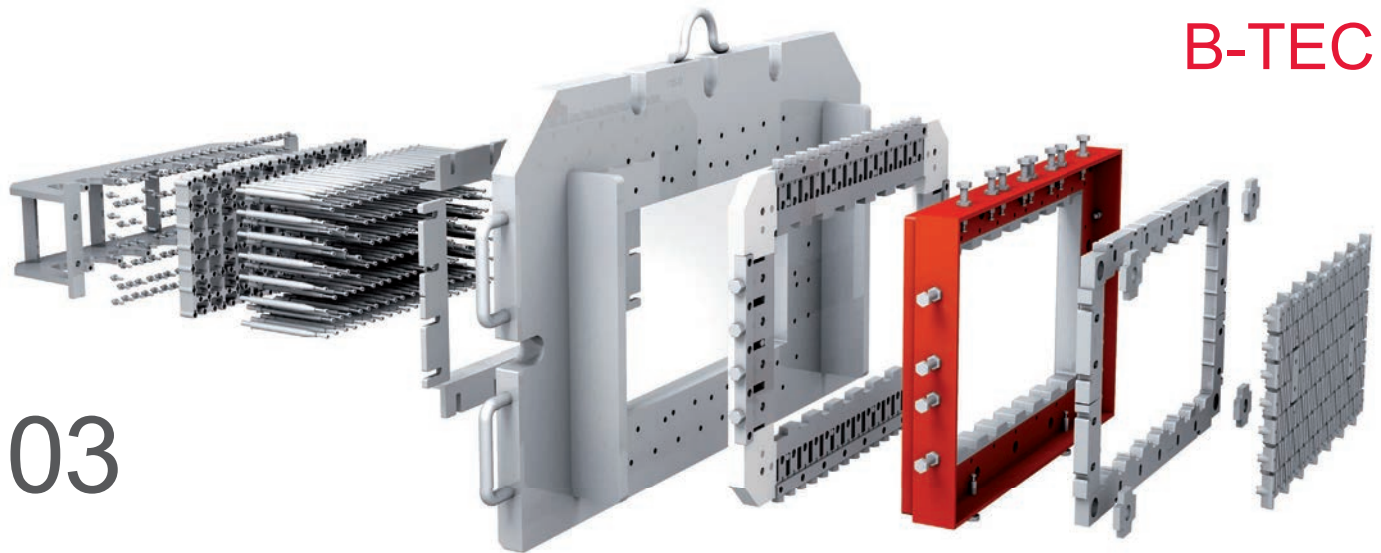
To understand what makes up a ZMB BRAUN die is to understand the needs of our clients worldwide. Although some components are similar, we pride ourselves in delivering customized solutions according to our clients' demands. In order to remain at the forefront of technological advancement, ZMB BRAUN continually invest in software and equipment to test our products.

VARIO-TEC



The VARIO-TEC die consists of different modules and can be designed in different combinations. The core bar is the heart of the die which is made in welded construction. The construction is unique and fitted individually for each customer. This component is very exposed to extreme wear. We ensure our core bars the best wear resistance through our in-house hard chrome plating facility.

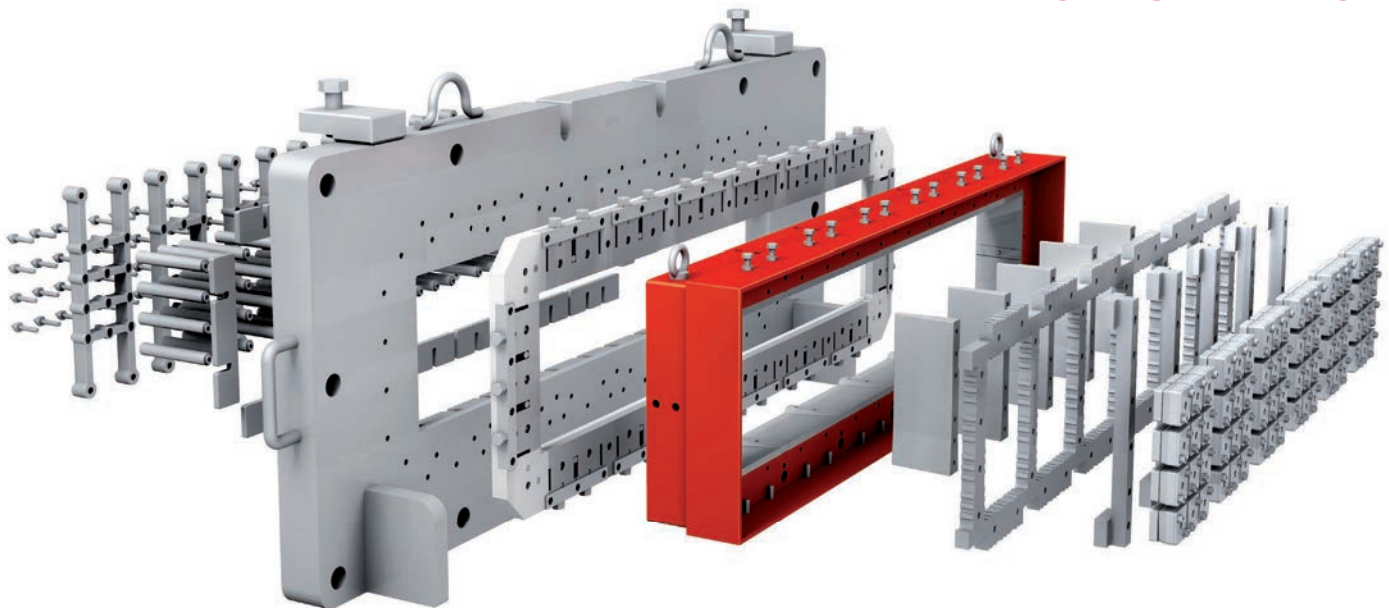
The inner shape of the brick is created by forming elements, the cores. Therefore the cores are an essential part of the quality and feasibility of the brick. ZMB Braun has many years of experience in metal processing and handling with various materials, such as ceramics and tungsten carbide.



B-TEC

B-TEC's construction standards can be universally applied for a wide range of product groups and stands for a modular design which can be adapted to the respective brick format. The extrusion advance can be adjusted using various control possibilities. Among other things, this can be achieved by exchanging the easily fitted, core rods with various core rod diameters.

In addition, the extrusion advance can be individually controlled using the external regulating system (MSP) as well as the pre-configurable slides on the die fixing plate. The extrusion outlet can be adjusted using the four-sided adjustable outlet ledges in the 4S-Vario system using the adjustment screws.



MODUL-TEC

The MODUL-TEC construction standard is universally applicable for various product groups and is a modular design, which will be adapted to the respective brick format. The push of the clay column can be adjusted by various regulating options. Among other things, this can be guaranteed with the replacement of easily mountable, compatible core rods by different core rods diameter.

In addition, the flow of the clay column can be regulated by the external regulation (MSP) and the preset sliders at the back of the die fixing plate.

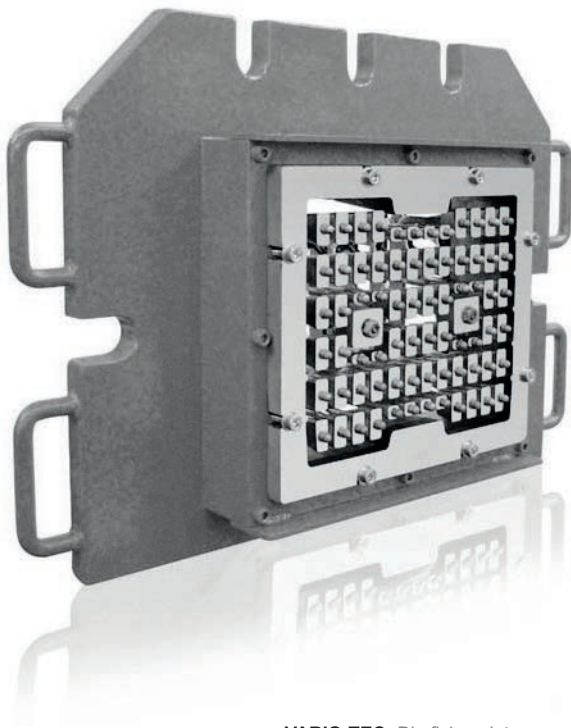
The MODUL-TEC construction is set individually depending on the products and can be supplied with different construction depths or modules. This system is applicable for different product groups.

Masonry Brick Dies

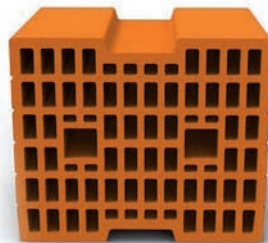
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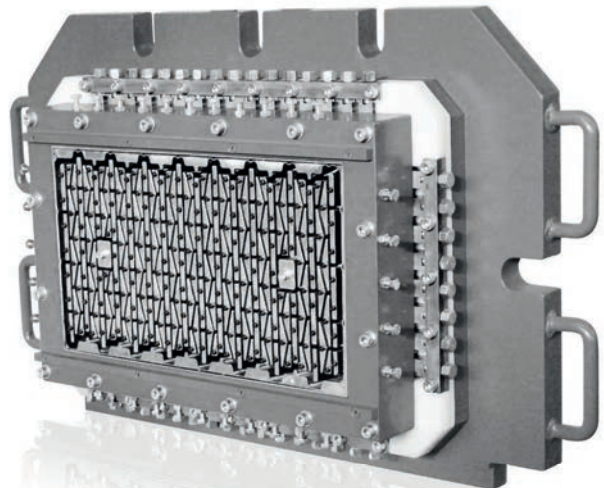
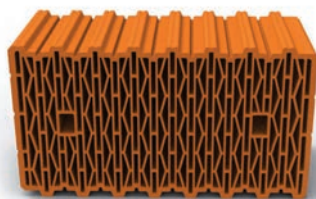
ZMB BRAUN is the market leader when it comes to innovation relating to the production of dies for masonry bricks. Due to the high tolerance requirements for the stegbreiten, precision and quality is of the utmost importance. ZMB BRAUN's modern machinery can achieve these tolerances and therefore produce high quality filigree dies for the Big Block bricks.



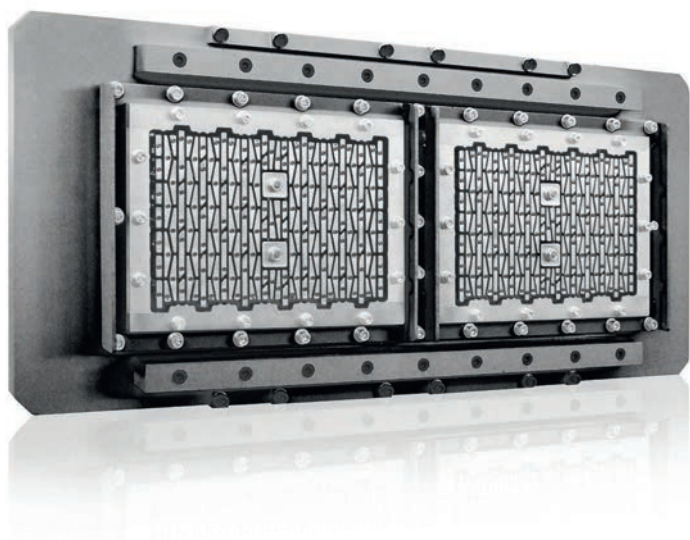
VARIO-TEC: Die fixing plate,
Die frame, exit frame
Brick size: 25 x 25 cm
Perforation: Slot design



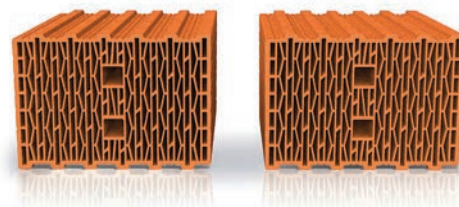
VARIO-TEC: Die fixing plate,
Die frame, liner
Brick size: 49 x 24.7 cm
Perforation: Grate-Slot design



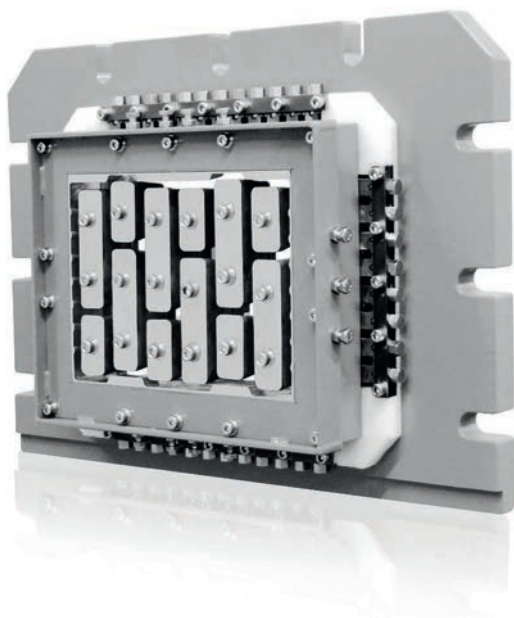
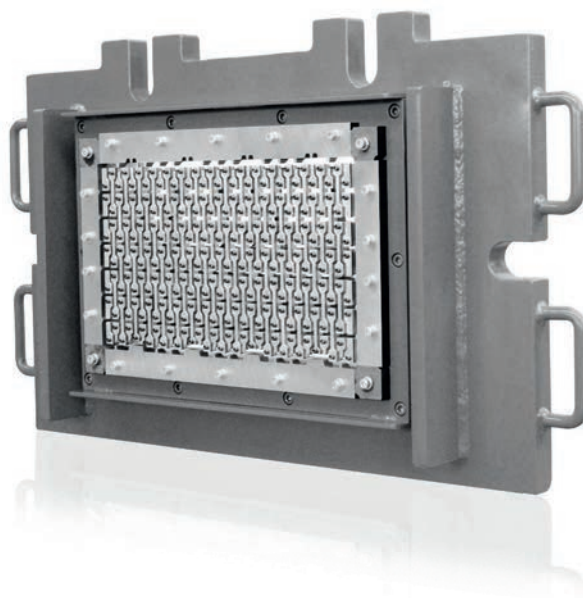
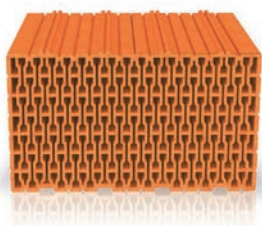
05



VARIO-TEC: Die fixing plate,
Die frame, exit frame adjustable
Brick size: 36.5 x 24.7 cm
Perforation: Grate design



VARIO-TEC: Die fixing plate,
Die frame, exit frame adjustable
Brick size: 38 x 25 cm
Perforation: Special design

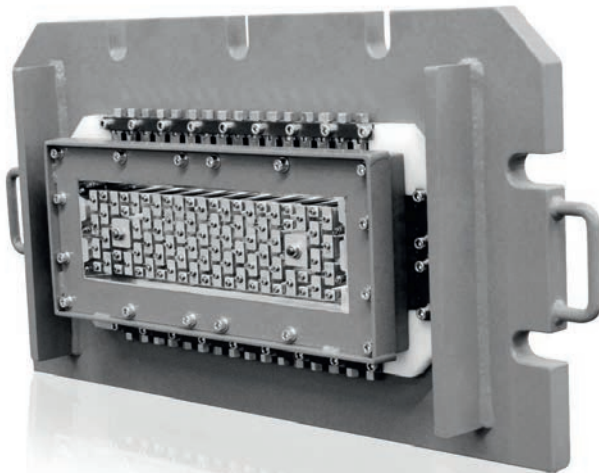


VARIO-TEC: Die fixing plate,
MSP, Die frame, liner
Brick size: 36.5 x 24.7 cm
Perforation: Heat insulating filled design

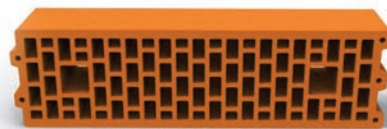


Masonry Brick Dies

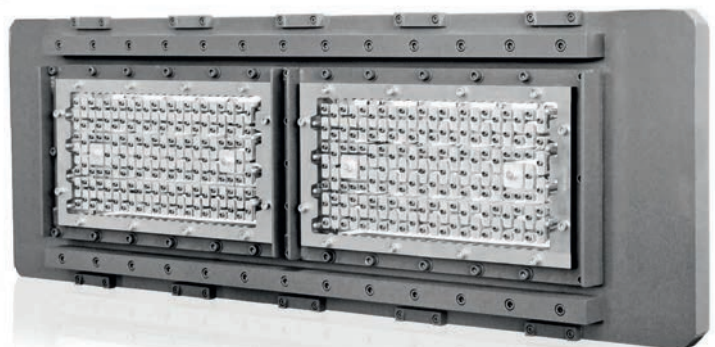
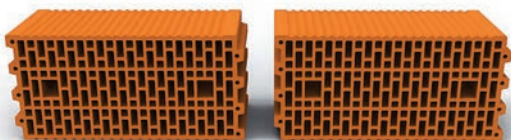
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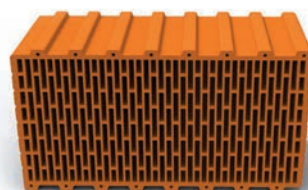
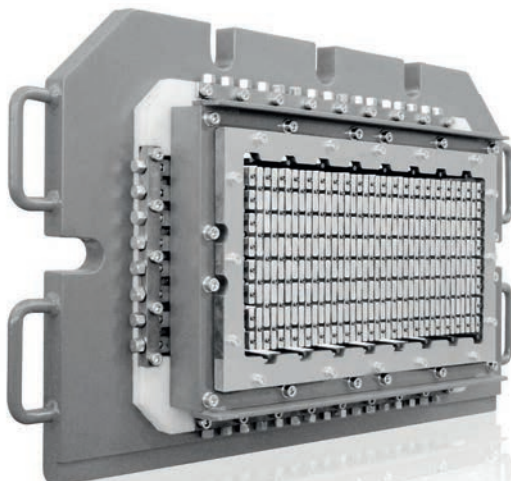
VARIO-TEC: Die fixing plate,
Die frame, liner
Brick size: 14 x 49.7 cm
Perforation: Slot design



VARIO-TEC: Die fixing plate,
Die frame, exit frame adjustable
Brick size: 24 x 49.7 cm
Perforation: Slot earth quake design

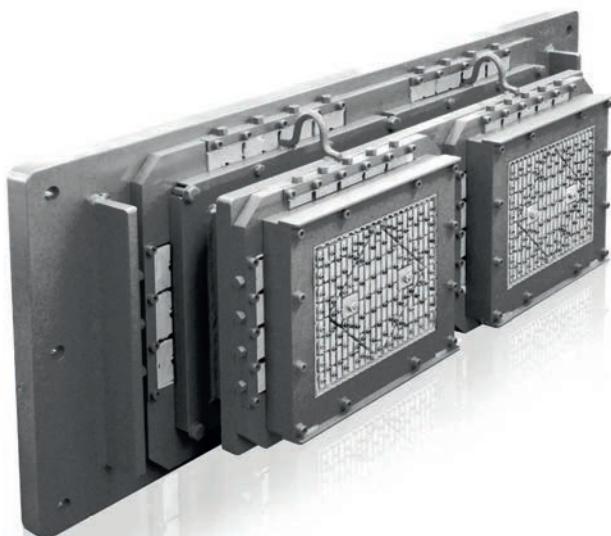
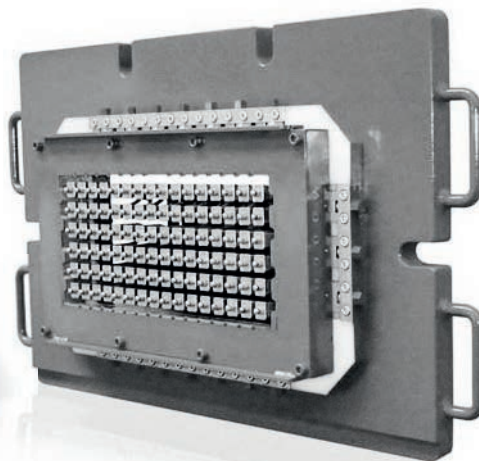
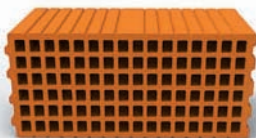


B-TEC: Die fixing plate, MSP,
Die frame, exit frame adjustable
Brick size: 49 x 24.7 cm
Perforation: Slot design

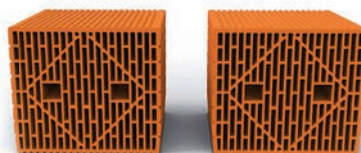


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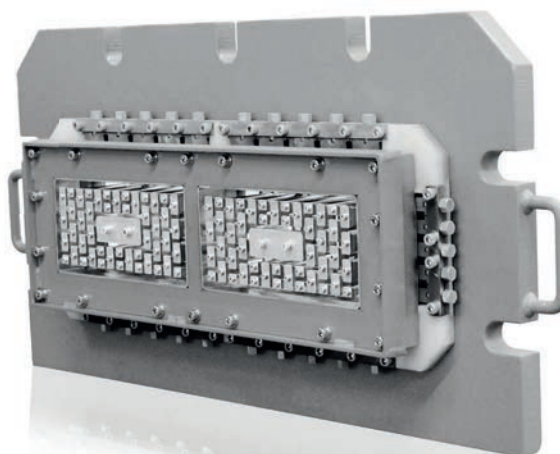
VARIO-TEC: Die fixing plate,
MSP, Die frame, liner
Brick size: 24 x 37.2 cm
Perforation: Honeycomb design



MODUL-TEC: Die fixing plate,
MSP double, Die frame, liner
Brick size: 30 x 25 cm, double exit
Perforation: Slot SX design



VARIO-TEC: Die fixing plate,
MSP, Die frame, liner
Brick size: 29 x 14 cm
Perforation: Slot design

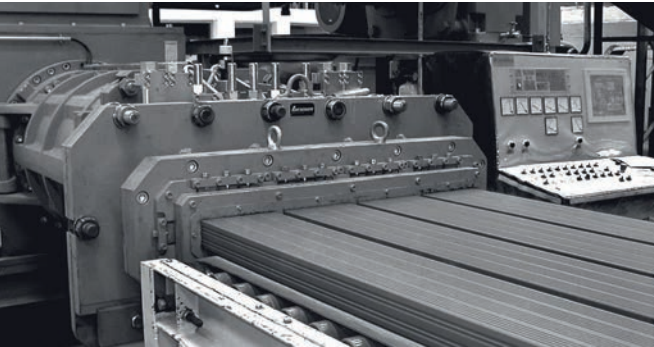


VARIO-TEC: Die fixing plate,
Die frame, liner
Brick size: 8 x 49.7 cm
Perforation: Slot design



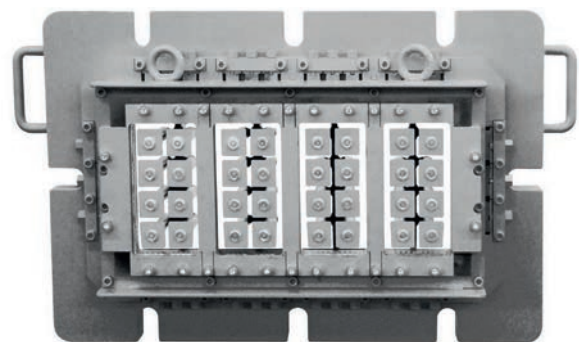
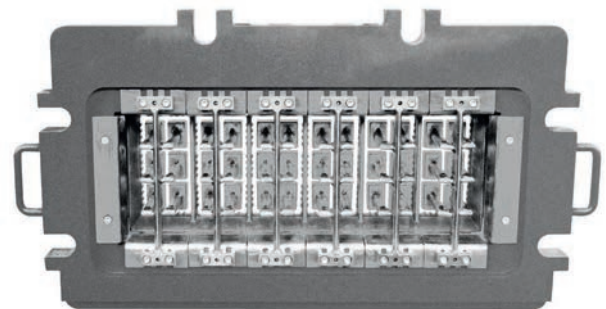
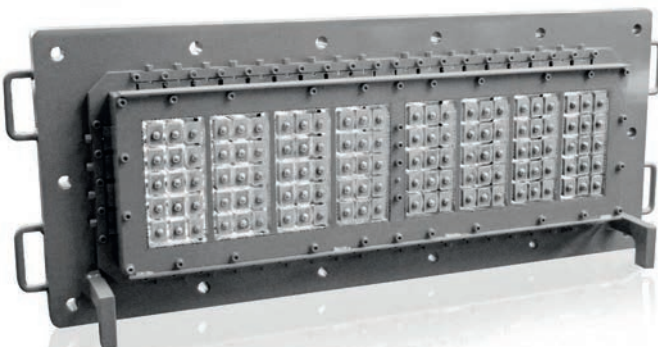
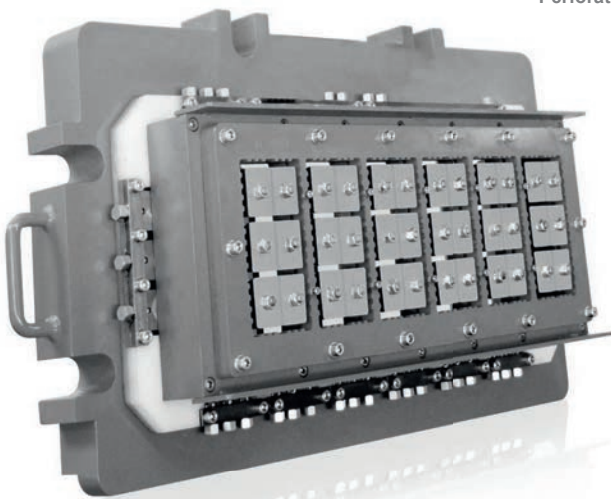
Hollow Brick Dies

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ZMB BRAUN offers a large variety of different options for Hollow Block die's. The lifetime of the die is one of the most important criteria for our clients and this is given careful consideration during the design phase of the die. ZMB BRAUN offers various solutions including ceramic, tungsten carbide and hard chromed.

VARIO-TEC: Die fixing plate,
MSP, Die frame, exit frame
Brick size: 10 x 20 cm, 6-exit
Perforation: B8



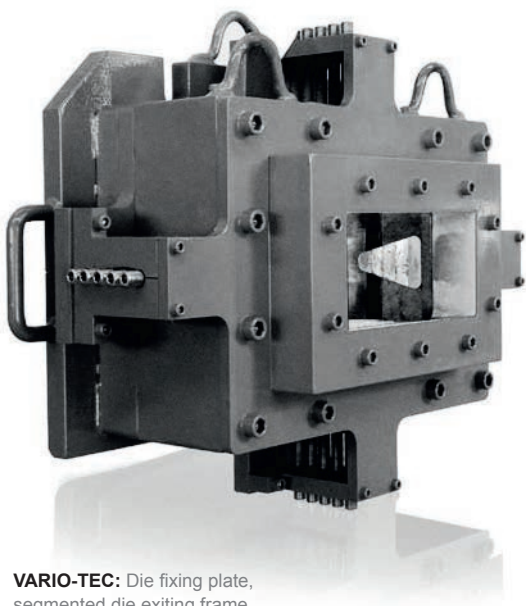
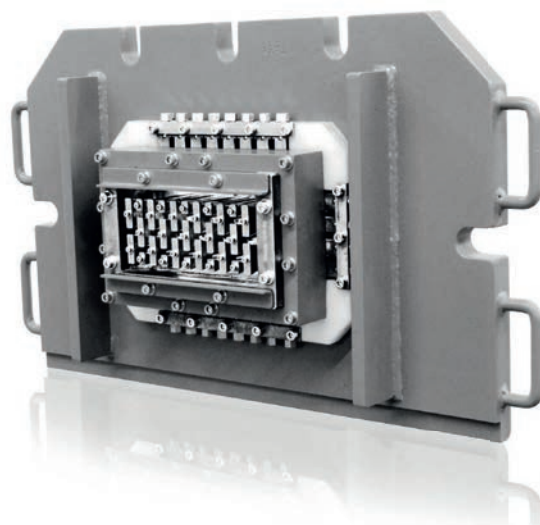
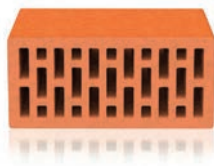
VARIO-TEC: Die fixing plate,
MSP, Die frame, exit frame
Brick size: 15 x 20 cm, 8-exit
Perforation: B12



The geometry and raw materials used for the die combined with the die wear resistance are the most critical factors when producing die's for facing bricks and split tiles. ZMB BRAUN's many years of experience in this area mean we can deliver the required quality levels of our all our clients worldwide.



MODUL-TEC: Die fixing plate,
MSP, Die frame, liner, exit frame
Brick size: 25 x 12 cm
Perforation: Slot design



VARIO-TEC: Die fixing plate,
segmented die exiting frame
Brick size: 25 x 12 cm
Perforation: Paver

VARIO-TEC: Die fixing
plate, cast exit frame
Brick size: 30 x 1.6 cm, 2-exit
Perforation: Split tile



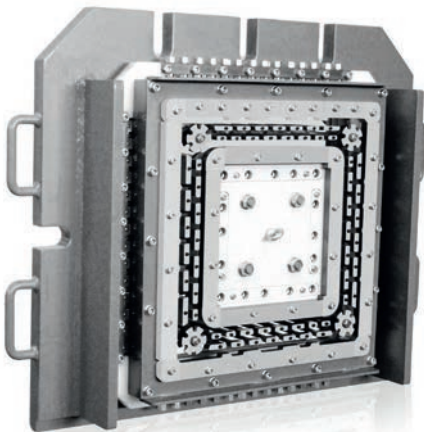
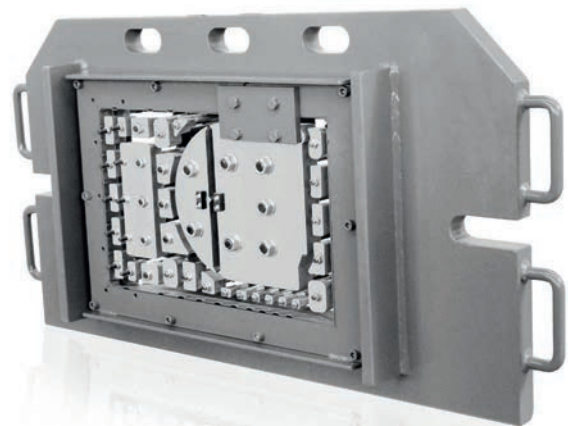
Special Dies

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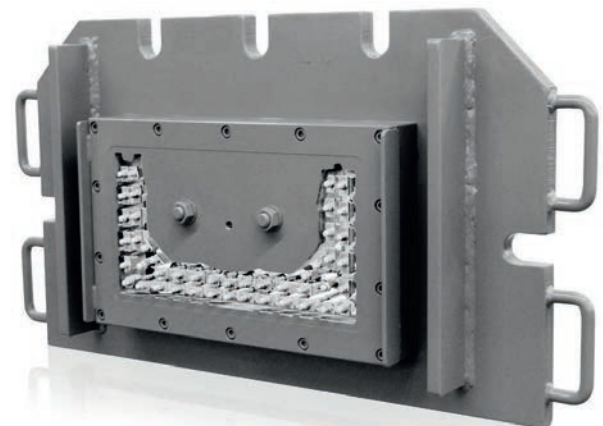


The design and accuracy of the die is particularly important for special designs, chimney die's and u-shaped lintels. These complex die's require close co-operation with our clients and a strong understanding of brick production. ZMB BRAUN are able to achieve high success rates due to the experience of our technical consultants and in-house engineers.

Roller shutter housing brick
VARIO-TEC: Die fixing plate, Die frame, liner
Brick size: 49/42.5 x 30 cm
Perforation: Slot design



Chimney brick
VARIO-TEC: Die fixing plate, MSP,
 Die frame, exit frame adjustable
Brick size: 42 x 42 cm
Perforation: Slot design



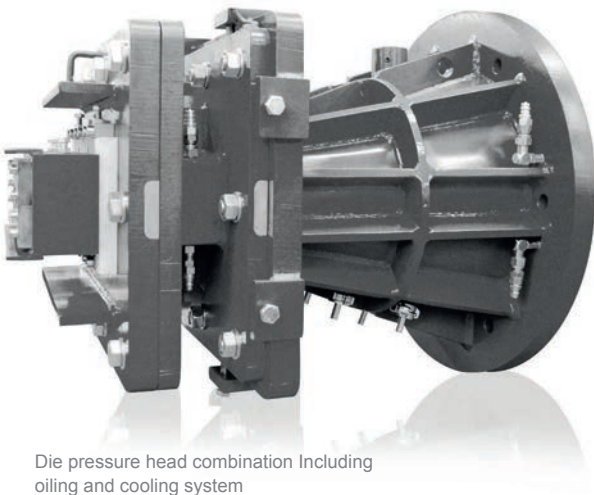
Chimney brick
VARIO-TEC: Die fixing plate, Die frame
Brick size: 40 x 20 cm
Perforation: Slot design



Pressure Heads

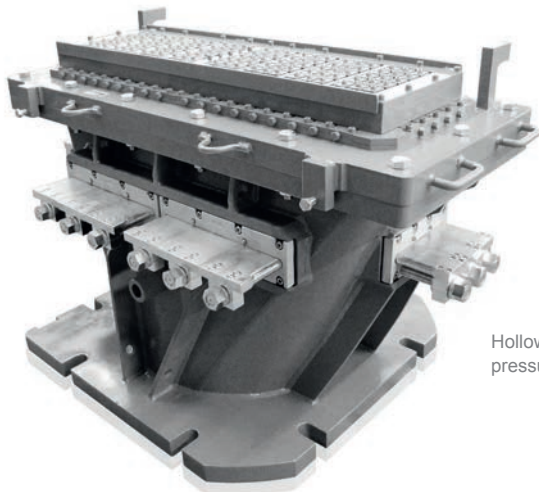
11

The pressure head forms the connection between the extruder and the die and it is therefore a key component. ZMB BRAUN offers many solutions to ensure an optimal material flow. In addition, ZMB BRAUN offer a range of different options relating to the pressure head design including external regulation system or flow optimized plastic inlets.



Die pressure head combination Including oiling and cooling system

Pressure head with external regulation and plastic inlet



Hollowbrick die, 8-exit pressure head with external regulation

Stiff Extrusion

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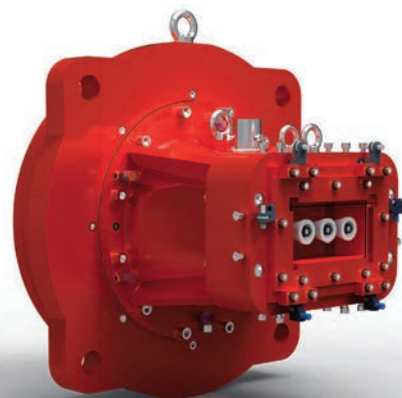
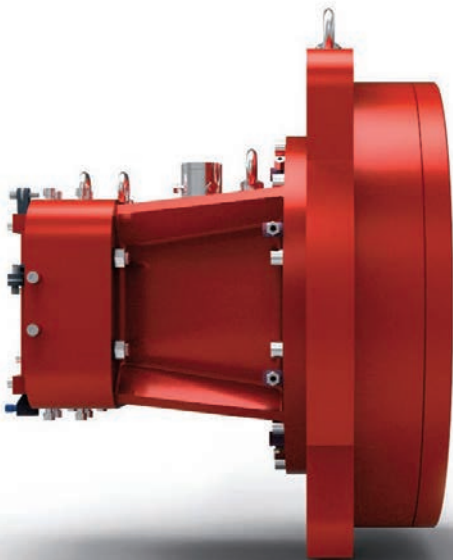
SVP 50 – Die-Pressure Head-Combination for Stiff Extrusion

ZMB BRAUN's SVP 50 is characterised by its special design that guides the flow of clay from round to oval and finally outputting the brick's typical rectangular shape. The shortened pressure zone helps to reduce friction therefore reducing energy costs.

The SVP50 consists of the Adaptor Plate, Oiling Ring, Pressure Head, Die Frame and Corebar. Braun offers a range of material options for all the components (except the pressure head). The material selection is dependent on budget, performance, material and product design and all are wear resistant.

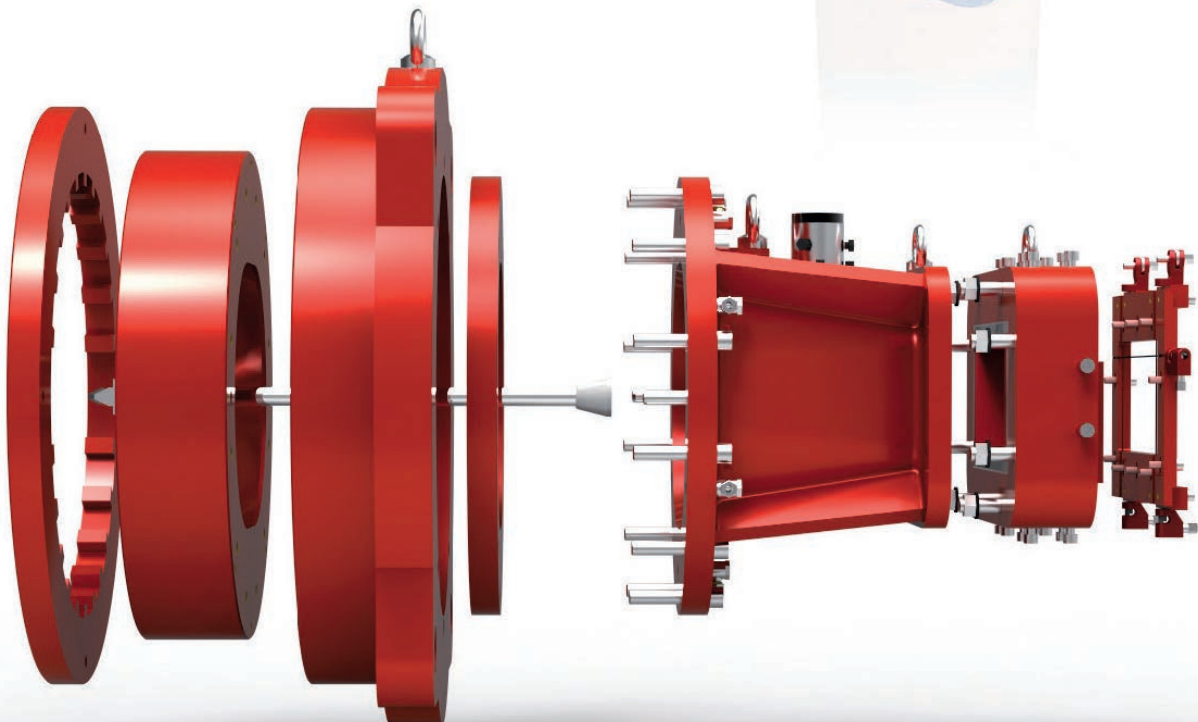
The key benefits of this solution are listed below:

- Ampere reduction on the extruder drive
- Lower oil consumption, approx. 8 litres/hour
- 6 spot oiling system enables oiling at the 4 corners, top and bottom
- Improved column flow and quality
- Improved wear life of pressure head and die
- Even brick density
- Perforation of up to 35% possible (dependent on clay quality)



ODS - Compact Oil Dosing Station

The oil dosing station was design to compliment the SVP50. This station offers a professional solution to ensure smooth running productions. The oil distribution is via 6 independent valves that feed a consistent supply of oil to the 6 point lubricating rings. Oil is then distributed to the four corners, top and bottom faces of the brick. The result is a very fine, evenly distributed film of oil that keeps friction to a minimum, therefore increasing output and improving the quality of the brick's surface.

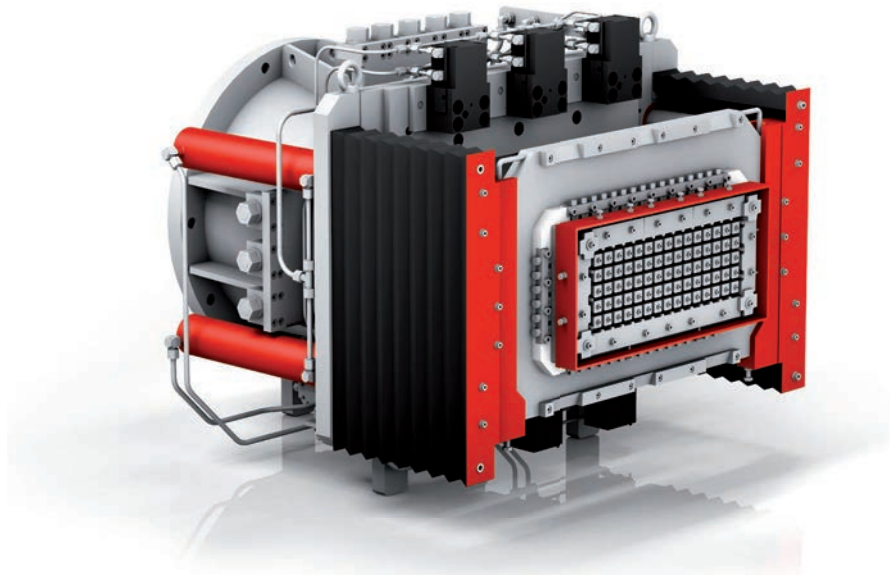


MSW / CLEAN-TEC / MMT

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At ZMB BRAUN we believe in adding value. Through years of experience working in brick plants and based on customer feedback, ZMB BRAUN has launched three machines to ensure our customers achieve maximum efficiency relating to the die's within their plants.

MSW



The MSW is a self-powered hydraulic unit for pressure heads to enable quick changeover times from one die to another. The key advantage is time efficiency as this system eliminates the need to clean all material out of the pressure head before changing the die. This process normally takes up to 30 minutes and multiple people. Using the MSW, plants can reduce this process to a couple of minutes and one person. The MSW is a universal system and ZMB BRAUN can ensure any pressure heads they deliver will work seamlessly with

this machine to ensure maximum efficiency. The changing process occurs using hydraulic cylinders, and through a hydraulic cotter clamping element the die is fixed with the pressure head. The MSW has a switch and control unit, which is separately arranged and connected with the pressure head with hydraulic pipes. ZMB BRAUN additionally offers to rebuild your existing pressure head to the MSW or deliver pressure heads already designed to upgrade your pressure head at a later stage.

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CLEAN-TEC

In order to effectively and economically clean the even more filigree extrusion dies, the companies HÄNDLE and ZMB BRAUN have developed a special extrusion die cleaning machine. The advantages are due primarily in its economical and ecological mode of operation. Time and energy saving cleaning is guaranteed by standard programs as well as individually adjustable nozzles. The high-pressure nozzles are specially designed for cleaning various types of clay,

resulting in minimized water usage and shorter cleaning cycles. The die's are cleaned using only water without use of additional chemicals, meaning the CLEAN-TEC is not only efficient but also an environmentally friendly choice.

The cleaning time will be approx. 30 minutes depending on format of the die and materials. Further advantages are the robust construction, easy operation with top loading and the modular design with standard parts and drives.



MMT

The MMT is a versatile table giving full access to all sides of the die to facilitate the maintenance process. This table allows one person to turn and position the die as many times as required in a few minutes to ensure fast and efficient maintenance.

ZMB BRAUN custom design the table dimensions according to each customer's die requirements. This ensures that one table will function with all dies a customer is expecting to use and the table is fully portable and can be easily relocated within the plant.

