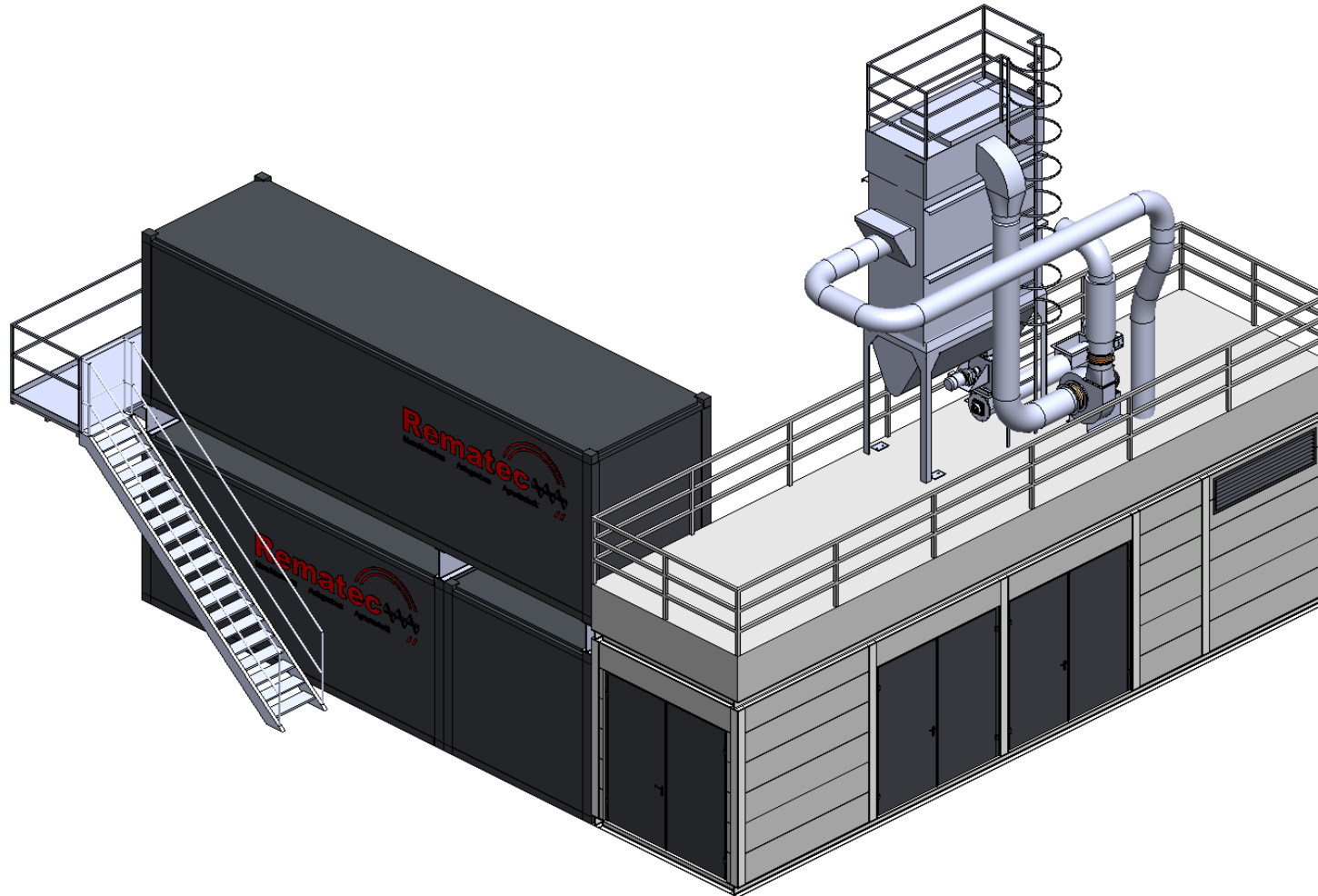


# RPB

## Rematec – Pelletizing - Box



## **Precondition for the commissioning of a RPB:**

The RPB is constructed and developed to produce pellets from grained material. The type of material suitable for the process must be given free from the manufacture of the RPB in order to adapt it for the special purpose.

For the pellet process, especially wood waste sawdust and shavings can be used for the production of biomass fuel. Also, agricultural products can be used for the production of food or biomass fuel.

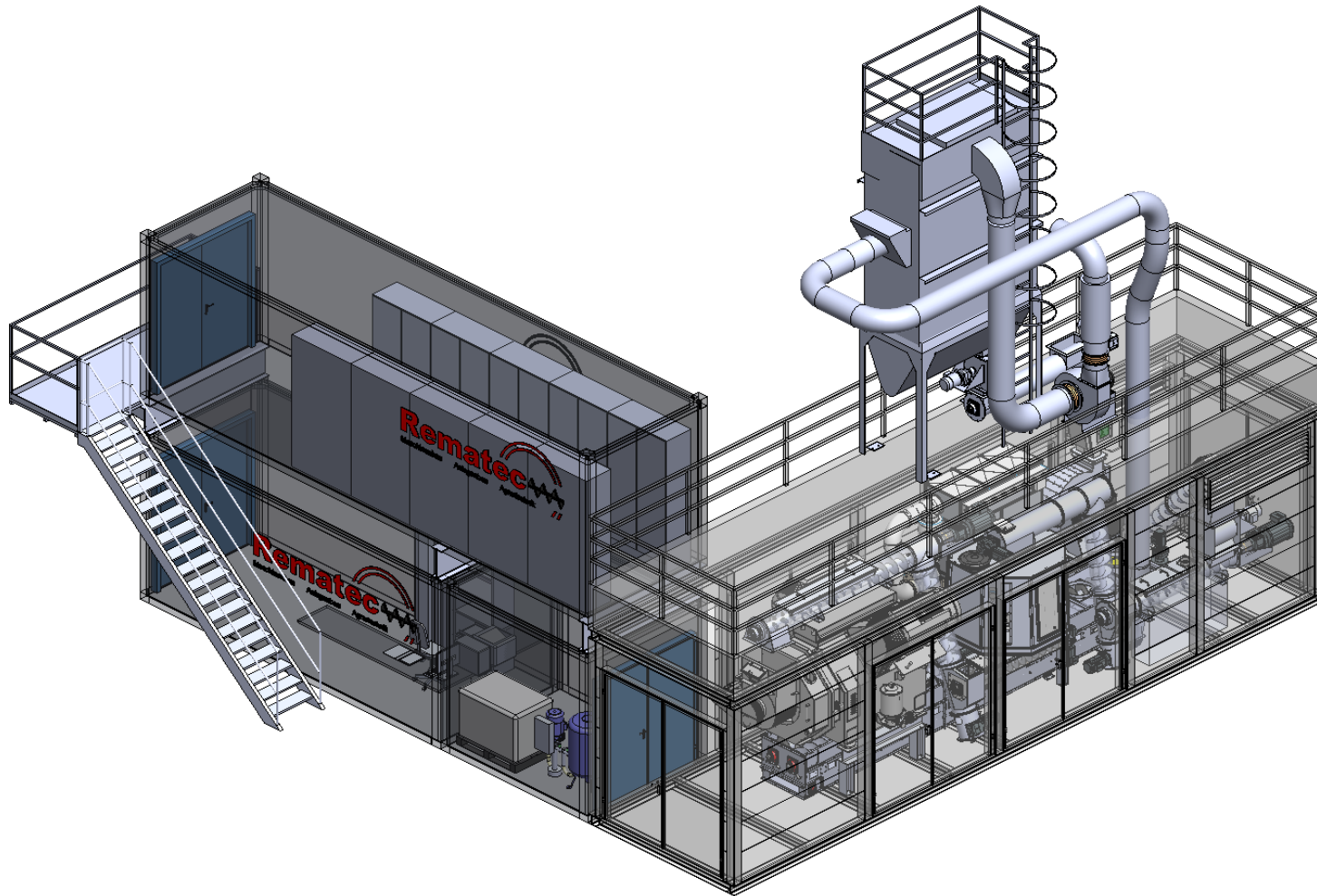
In the RPB Box only material can be used, which are released from the producer in size, moisture content and density. This is documented in the original user guide for the pellet unit. If the RPB will be used otherwise, a new release must be transmitted from the producer.

In any case the material must be from foreign parts like stones or metal.

## **Commissioning:**

Every RPB is delivered in pre mounted modules. The mounting can be done quick and easy on site.

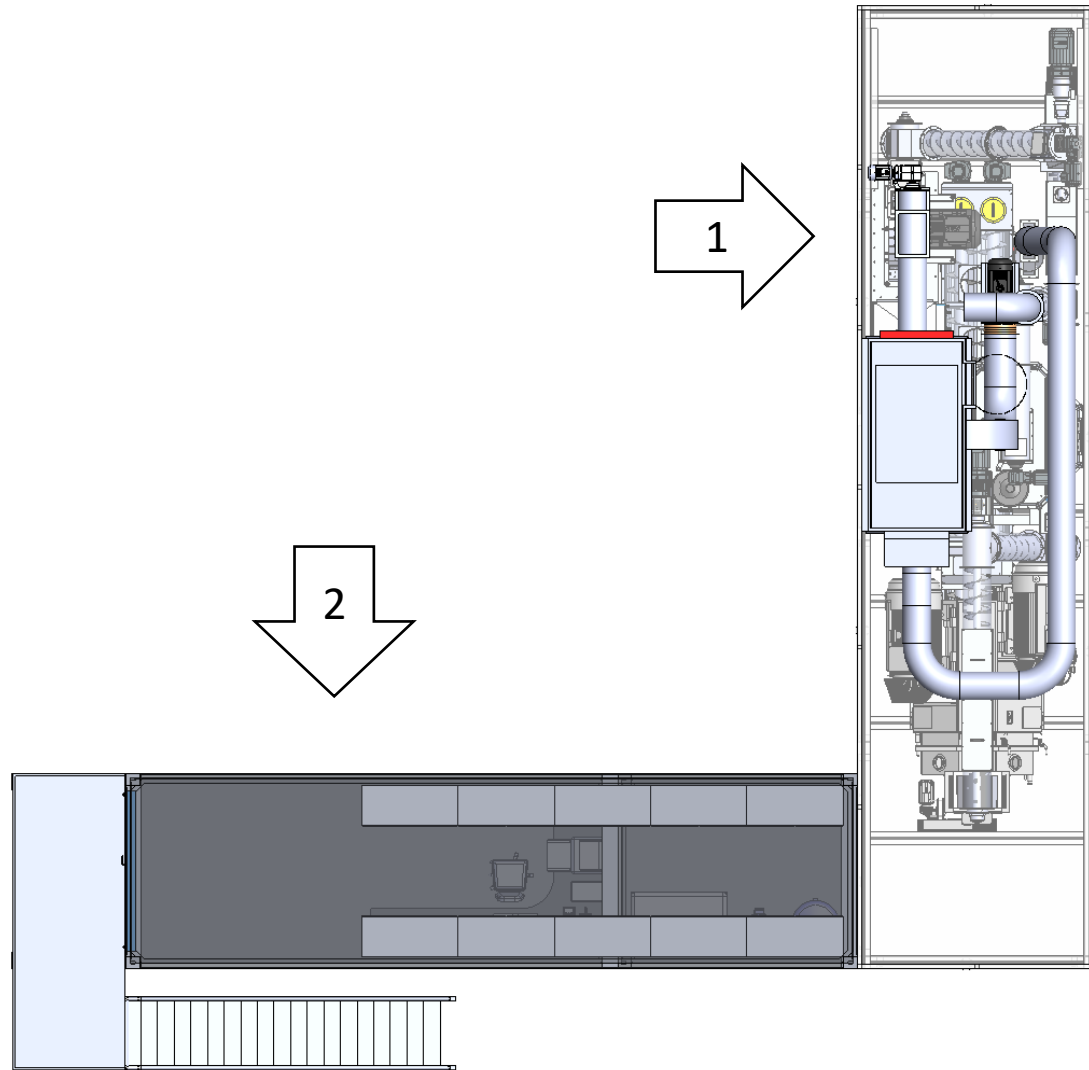
Before the start of production, it is necessary to make a cold and warm commission by the producer, or by a company authorized by the producer. Only with written permission after check of faultless mechanical and electric installation and functional run, the pellet unit can start with commercial production.



The RPB is a mobile pellet unit, installed in 3 boxes. The unit is called mobile, cause it is easily possible to dismount it and to reinstall it somewhere else. RPB is the short form of **R**ematec **P**elletizing **B**ox.

The complete machine is covered against weather and protected against freezing and built for the installation outside.

For the installation, there is only a concrete foundation in form of an even plate according the structural loads necessary.

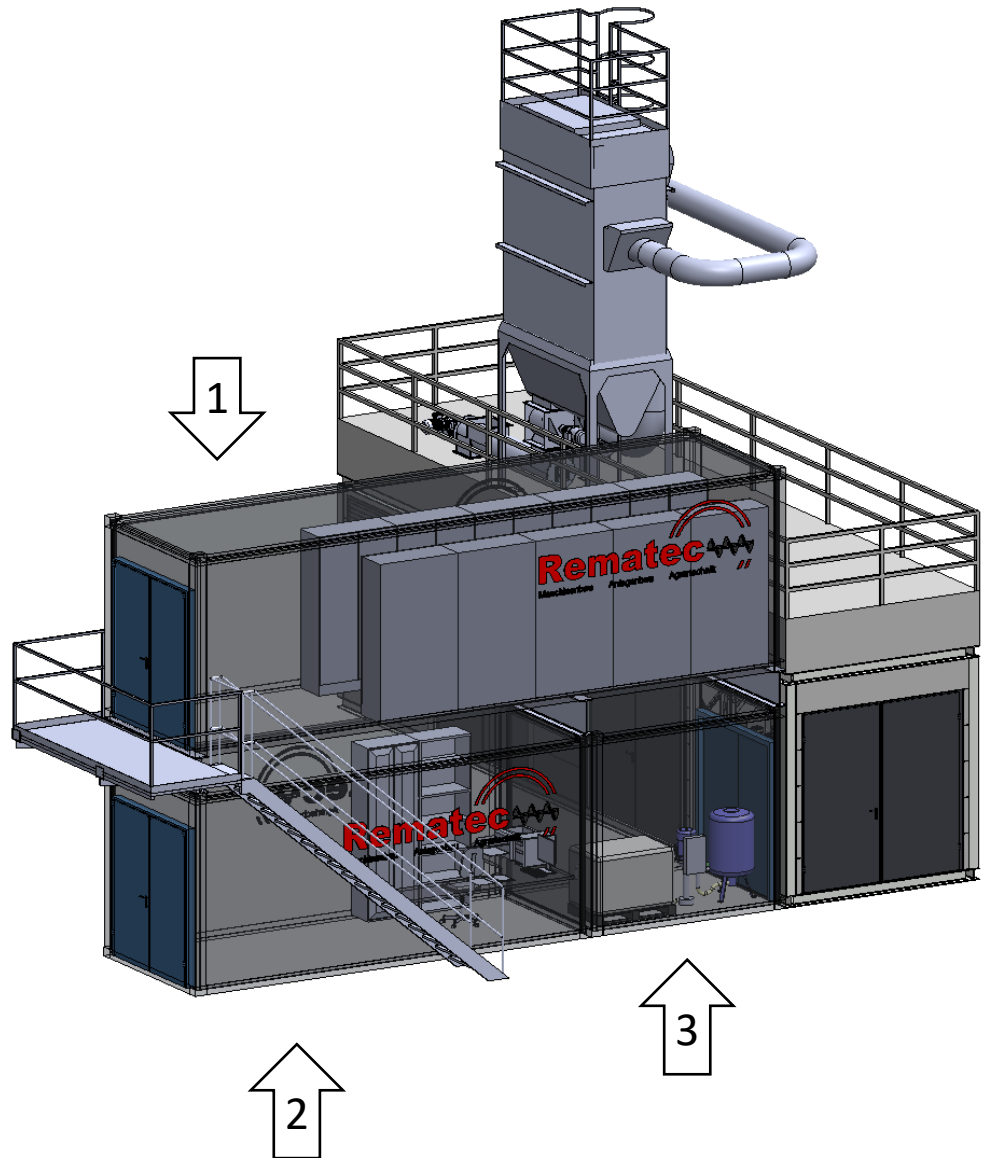


The pellet unit is divided in two separate parts. Part 1 is the pellet unit as box, part 2 is the control and office container and the electric cabinet container.

Both are separate closed sectors with unique aspiration and separate access.

These parts are delivered as complete ready units. The cabling inside of the pellet unit is done. The cables just have to be reconnected with the electric cabinet container. The smaller switches are provided as plug and play, but the cables for mill, press and fan must be connected as usual.

Around the RPB it is recommend to keep an area of 5 meters free for easy maintenance work. The necessary space is shown on a separate document.



The electric cabinet container is mounted over the office container and can be reached over stairs. The process is controlled and guided by a high end Siemens control system. All frequency converters, switches and sensor modules are mounted inside of this container as a separated clean device and is fitted with an air condition system.

The office container is for the service personal. From here the running process can be started and supervised on a monitor. Speed and capacity and the adding of starch can be adjusted. The office container provides also the space for all necessary quality tests, like moisture control, stability and weight of the pellets. A third room contains the spark detection system and if necessary also a compressor for compressed air.

The container has a certified spark and fire detection with spark erasing system. All points where high energy treats the material are supervised and controlled. In case sparks are arising, the system automatically erases the sparks with high pressure injection of water and warns the service personal. If the sparks are continuous, the complete line shuts down automatically.

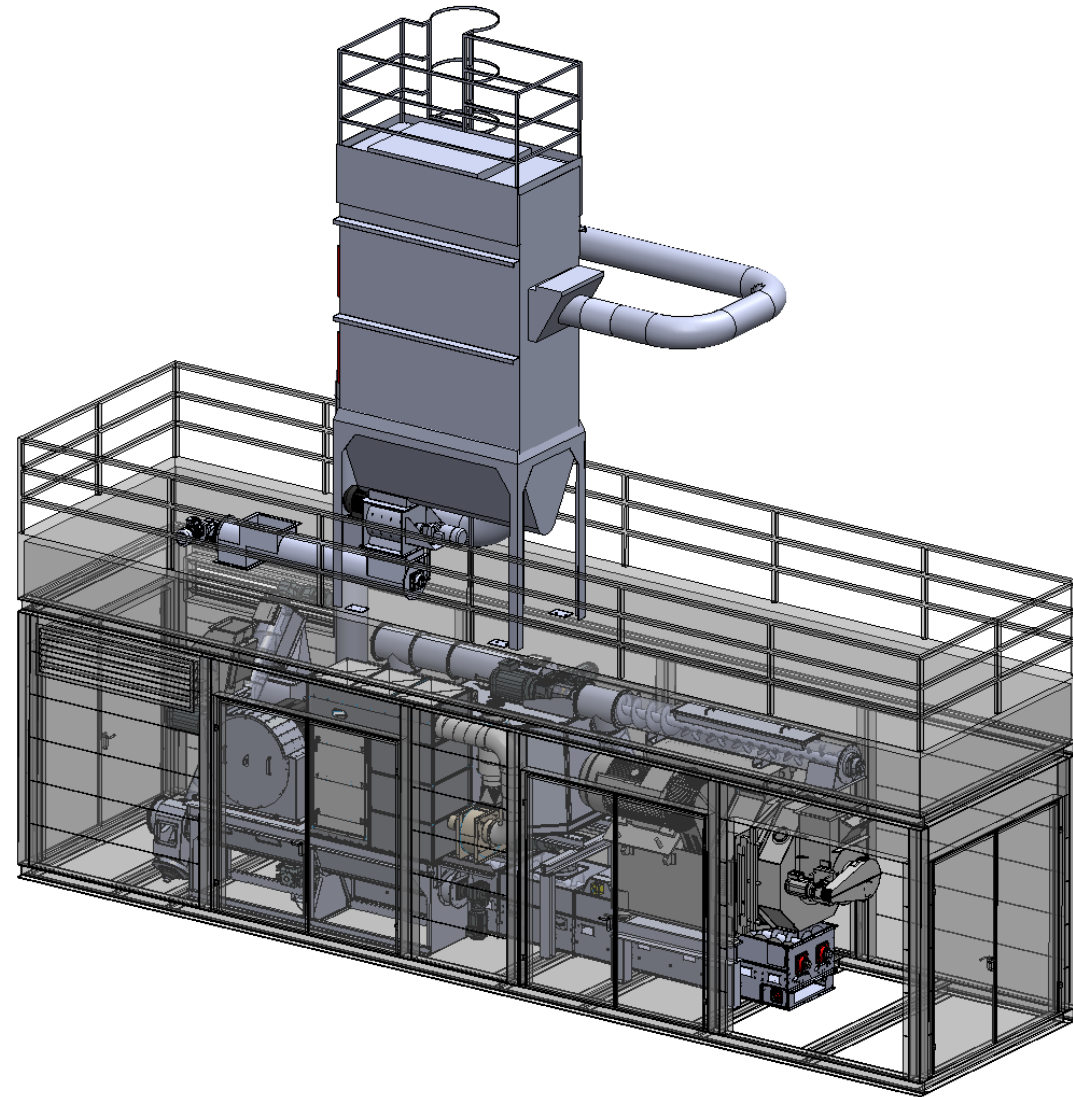
The press has additional own temperature control for the rollers and at the outlet of the press an infrared detection controls the outcoming stream of pellets. If the pellets get hotter than the adjusted temperature the process is stopped long before a fire can arise.

Hammermill and filter are protected with the spark detection and erasing system to ensure a maximum of safety in the process.

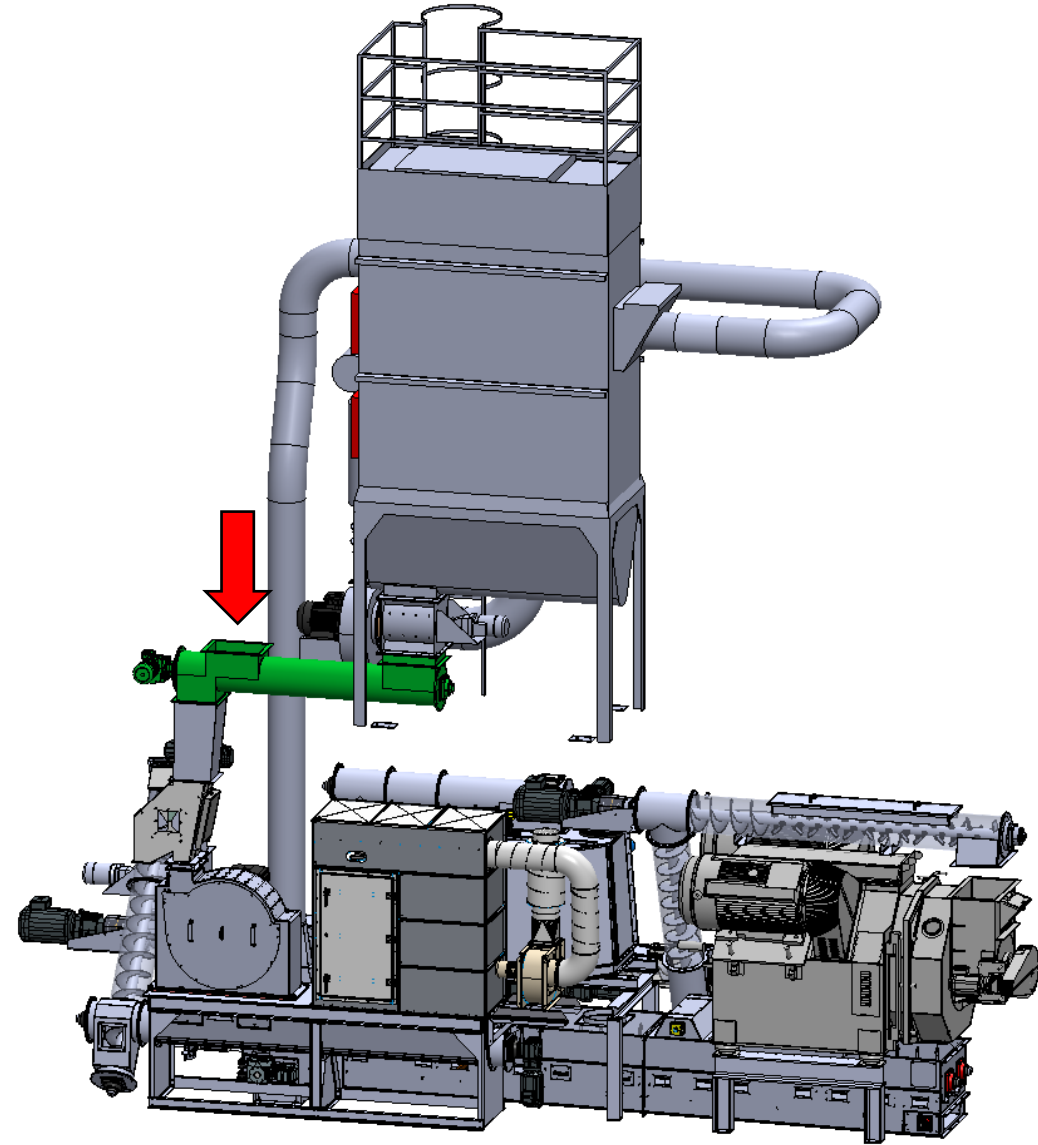
## Function of the pellet box

The characteristic of the RPB is a simple, but good structured construction which grants a continuous and unproblematic process of the pelletizing.

In the following description the single steps and the therefore used machines will be described. For easier understanding the described machines marked in green. For a better view on the described machines the box itself is hidden.



The unit start with a screw for the reception of the material and the transport to the pellet production line . Important is, that material will be given up to the screw in a steady equal and according to the consumption of the material dosed way. The dart marks the opening of inlet of the screw. In use the inlet must be connected to the prior conveyor in a way, that it is impossible to reach the machine by hand. The screw ends at the inlet of the hammermill.



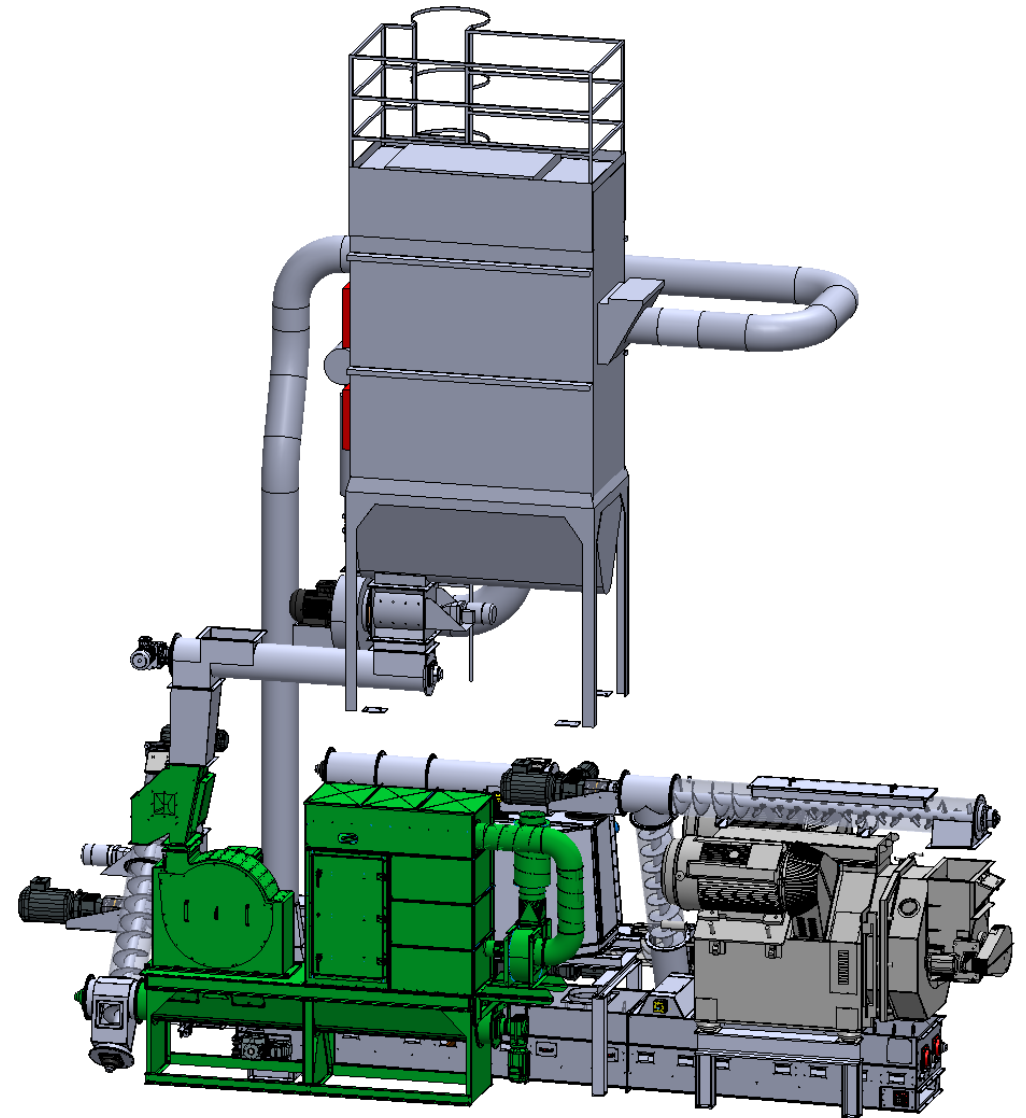


The material reaches the mill in dosed form. Although the material must be free of foreign part, there is a heavy part remover installed before the hammermill. Heavy parts are sourced out and magnetic metal parts are hold back from a magnetic plate. The heavy part remover can be adjusted with a flap. The removing depends on the density of the material.

The magnetic plate must be cleaned from time to time. The cleaning interval depends on the amount of parts coming with the stream of material.

After the heavy part remover with magnetic plate the material falls into the milling chamber. A rotor with knives is turning inside the mill and shortens the material as long, till the particle size is small enough to pass the surrounding screen. The screen holes depends on the used material and the screen can be adopted to each material. The passing of the material is supported by an aspiration system of the milling chamber. The aspiration not only speeds up the passing of the material also heat arising from the milling process is removed with the air stream. The air stream passes a filter installed on the basement of the mill and gets cleaned. The cleaned air is blown by a fan to the outside. The grinding unit is separated by a valve at the end of the transport screw below mill and filter and completes the grinding unit.

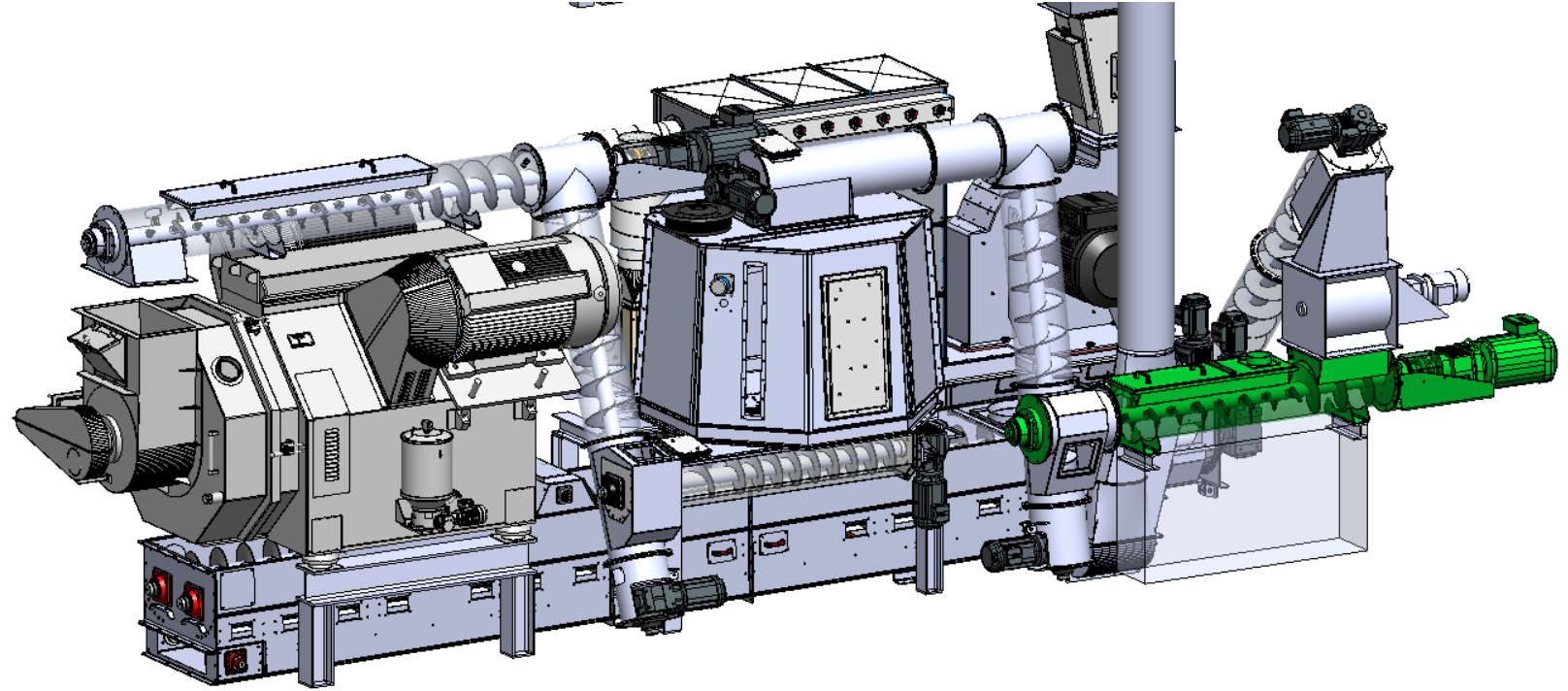
The complete construction is a pressure surge proofed construction and protected by a flameless pressure relieve valve.



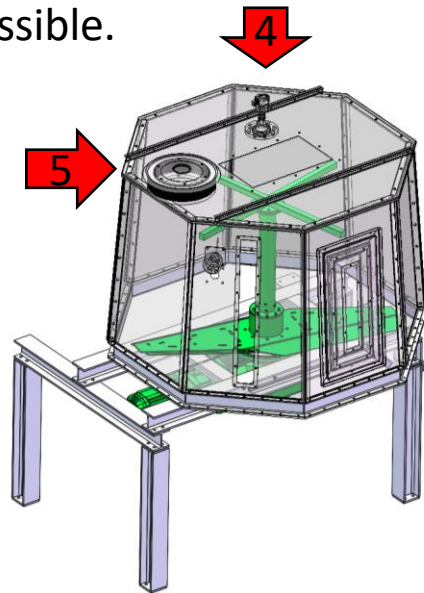
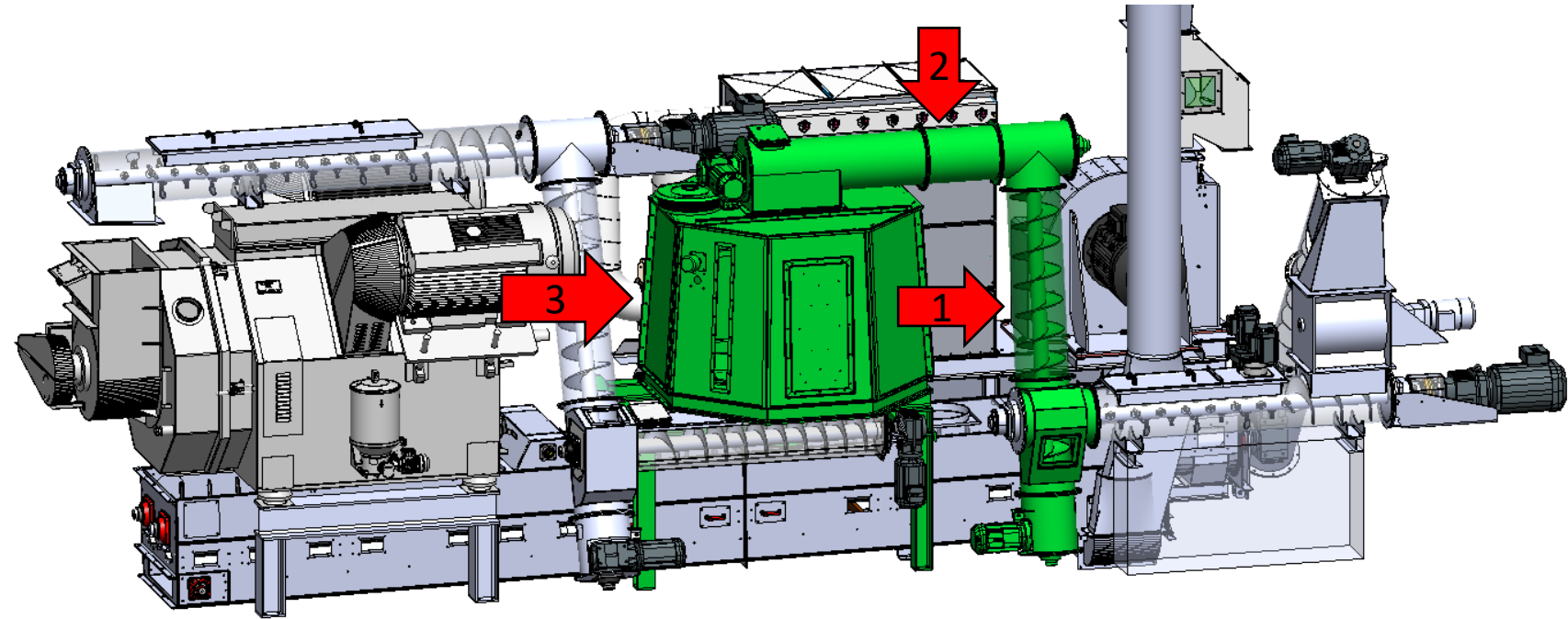
The conditioning describes the dosed adding of water to the material to the exact value, what is ideal for the pelletizing process. This is made with a paddle mixer, which is following to the valve of the milling unit. With the paddle mixer the water is optimal mixed into the material.

The water adding is based on a moisture control system, which measures the material after the paddle mixer. The system works for itself, only the wanted water content must be set at the control panel.

In the mixer also starch can be added a pelletizing help for higher binding of stronger hold of the pellet to fulfill the high quality regulations of DIN plus standards.



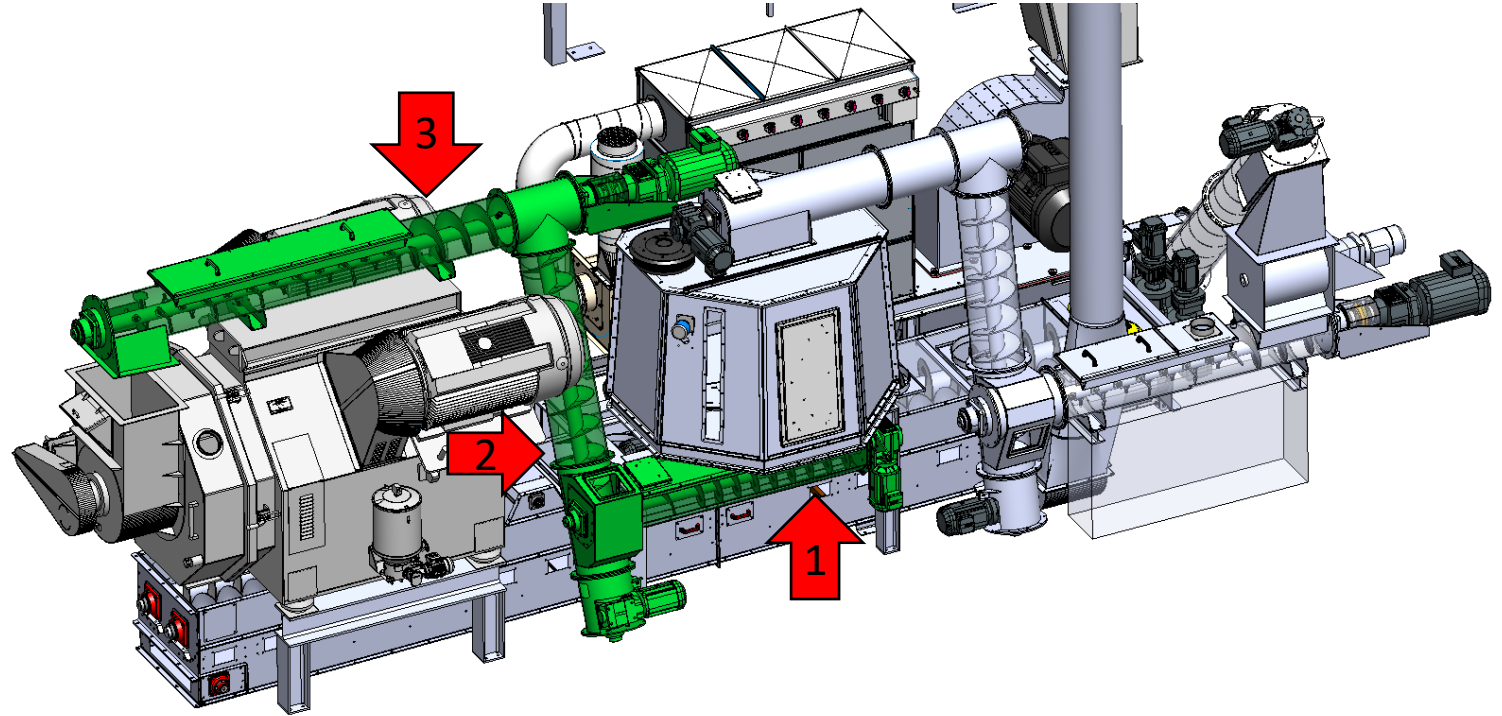
After the mixer two screws (1+2) transports the material to a bin (3) with discharge paddle. The material gets some time to inhale the moisture in order to avoid, that the water is only superficial on the material. With the special discharge paddle a first in first out of the material is made possible.



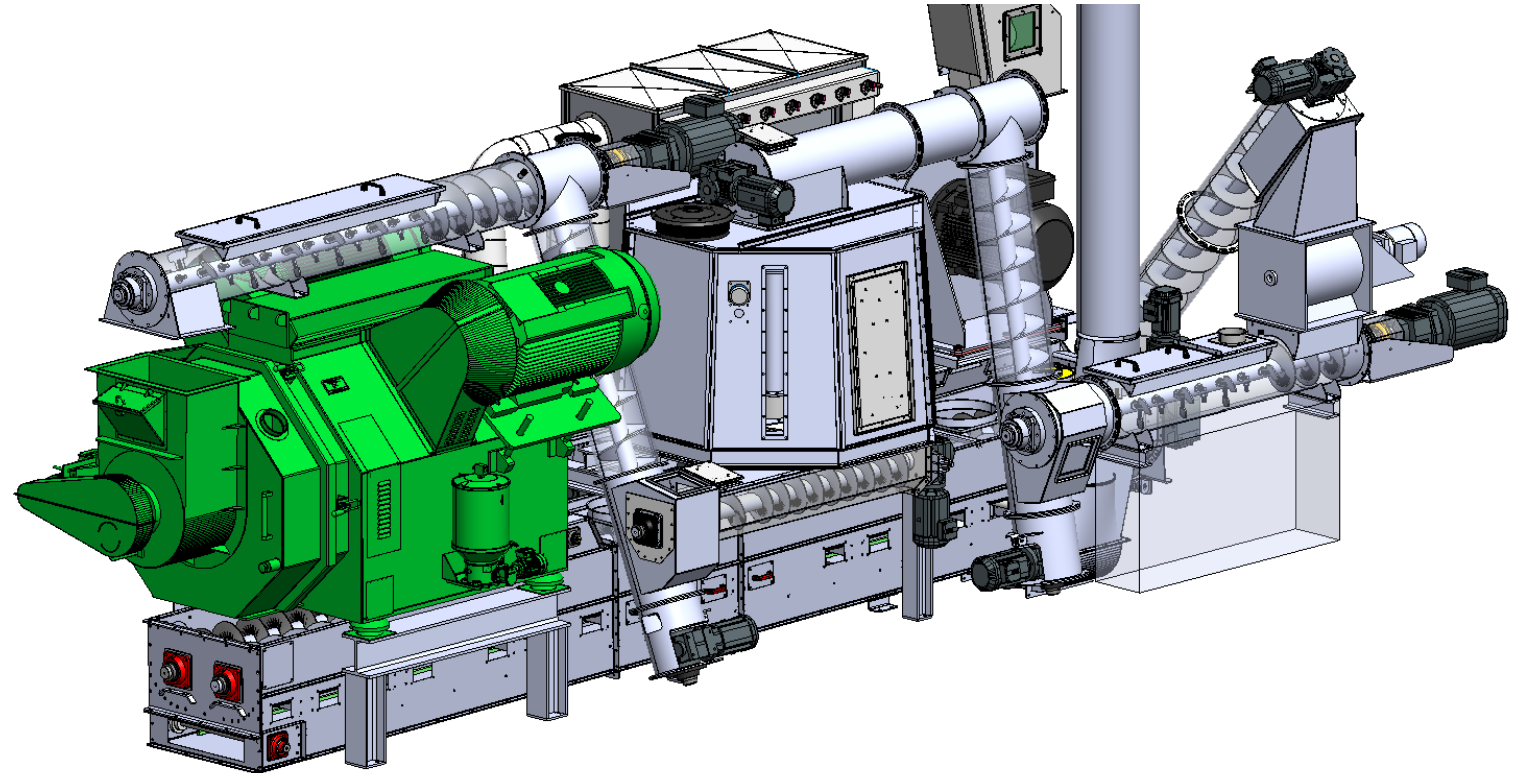
This filling of the bin is controlled by radar based level measurement (4) and activates the dosing of raw material to the hammermill. The housing of the bin is protected with a flameless pressure relieve valve (5) on top of the bin.

The bin keeps a screw below the bottom filled. The screw (1) is frequency steered and doses the material to the press. A second screw (2) transports the material to an additional paddle mixer (3) on top of the press.

This gives a last chance to variate the condition of the material. At this place some water or steam is added to create a superficial moisture on the material. The adding is manually regulated and depends on the used material.



The press produce the pellets. The material goes through the pellet press door to the die. For creating a good distribution of the material at the die, there is a forced input installed at the door center. The shape of the pellets is determined by the geometry of the holes in the die. With different length of the tunnel the shape and the density of the pellet is created. The material is pressed by rollers through the holes, while the die is rotating around the main axle of the press. The resulting pressure and the along going heat compresses the material in a way, that with leaving the tunnel, the material keeps the form and the pellet is born.



The high-pressure results in a big heating of the pellets. This is not good for the storage of the pellets. Because of this the pellets have to be cooled in the next step. Air is used as cooling medium. From the press outlet the pellets are guided into the REMATEC screw cooler. Inside this machine the pellets are transported with screws running with a very low speed of 2 rpm. This remains in a long time the pellets stay in the cooler till they are discharged at the end of the machine. On this way and during all the time fresh air is sucked through the pellets. Heat, but also dust is removed through holes in the housing of the screws. The dust gets collected and transported to the sucking point of the cooler. Hot air and dust are sucked to a filter outside the pellet box. In the filter dust and air are separated. The dust goes back into the pelletizing process and the clean air is blown out. With this cooled and clean pellets can leave the RPB box.

