

CRACKING



In this method polyolephines are subjected to the cyclical „cracking“ process at an increased temperature and under the presence of a selected catalyst. The products of this process are carbohydrate gases - which are burnt in burners - and fractions of carbohydrates whose boiling point lies within the range of the boiling point of petrol and diesel (light heating oil). The heavy oil fraction produced in this process is directed back to the „cracking“ process and it is not the final product of this method.

CRACKING

Small amounts of coke are a by-product containing the catalyst and the contaminants of the processed raw material.

A low sulphur content (normally below 20 ppm) and a relatively high stability are typical for components obtained from polyolephines. The quantity of the obtained components depends on the quality of the processed raw material, particularly on the share and type of contaminants, additives, admixtures etc.

A „cracking“ installation consists of the following parts combined together:

- installation for melting and decomposition of the raw material;
- installation for processing the raw material according to the catalytic „cracking“ method;
- installation for separating the individual product fractions by distillation;
- installation for dosing additives and stabilising the distillates.



At the beginning of the process the plastic materials are cut into small pieces and dried. Next, they are melted and decomposed in technological oil - normally it is the heavy oil fraction produced in the „cracking“ method, whose boiling point is higher than the boiling point of diesel.

It is normally transported by cogwheel pumps P-102 A/B into one of the two mixing units M-101/M-102 as technological oil. The excessive amount of heavy oil is directed back into the „cracking“ reactors.

The vapours gathering in the upper part of the column are condensed in the water cooler E-101 and subsequently directed into the container V-101. The container V-101 functions as a separator, separating gases from the liquid condensate, and the as a reflux container. One of the two pumps P-103 A/B pumps one part of the condensate as a reflux from the container V-101 into the top of the column C-101 and the remaining part into the containers as a distillate - the petrol fraction. The diesel fraction is taken up from the „blind“ bottom of the column.

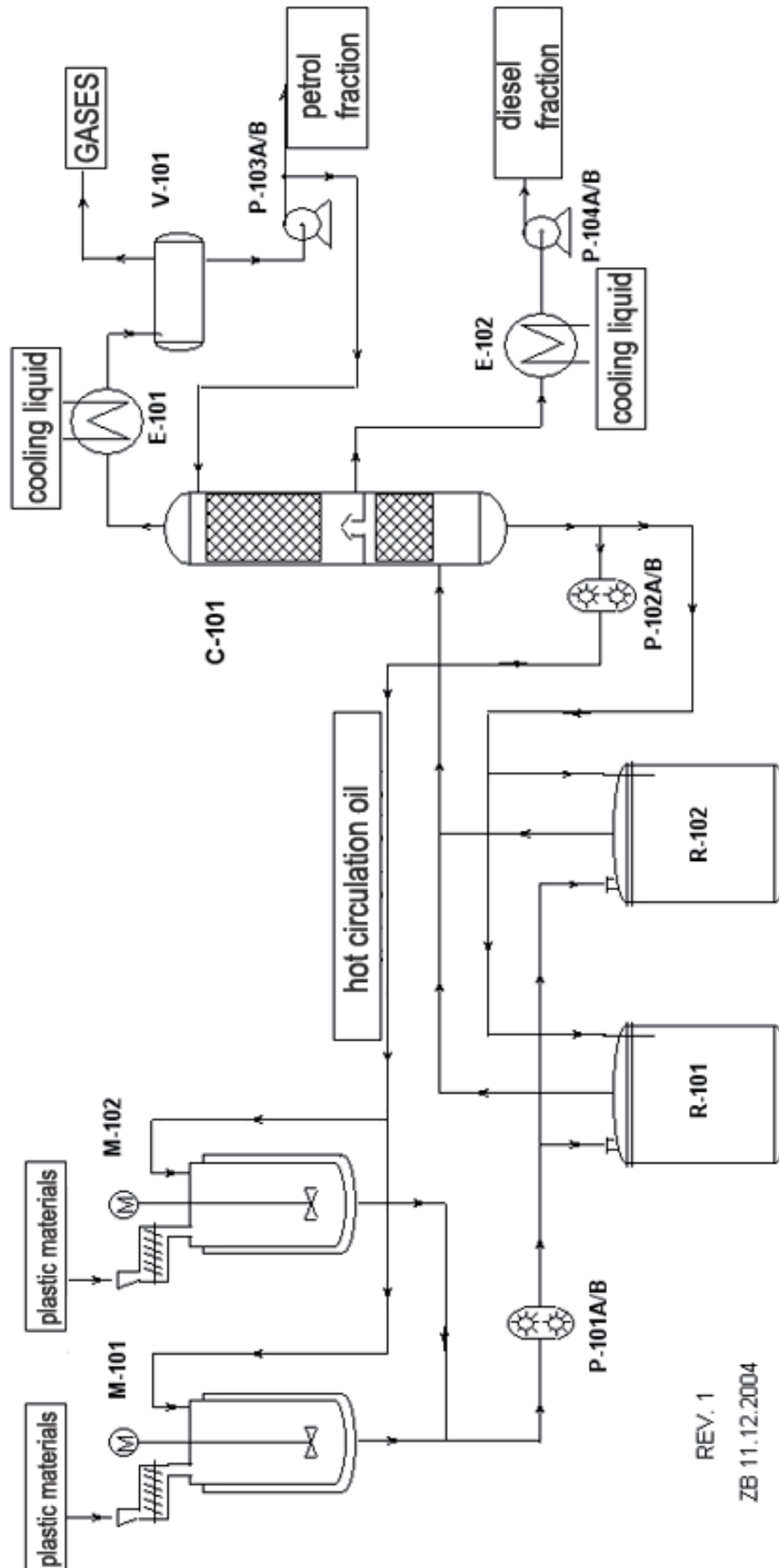


The decomposition takes place in one of the two mixing units M-101/M-102, which are heated up to 200°C (using hot oil or electricity). The plastic solution is transported by one of the two pumps P-101 A/B (due to the viscosity of the solution they must be cogwheel pumps) into one of the two „cracking“ reactors.

There are two versions of this installation (one is shown in drawing no. 1 and in the other one the plastic materials are transported into the reactors). The products obtained in the reactors are further directed into the rectification column C-101, where the individual fractions are separated. The rectification column C-101 is a column with a powder filling (Bialecki rings from metal, 25 mm) with a side outlet. The gathering heavy oil fraction is taken up from the lower part of the column. Next, it is cooled down in the water cooler E-102 (or air cooler) and transported with the pump 104 A/B into the container park.

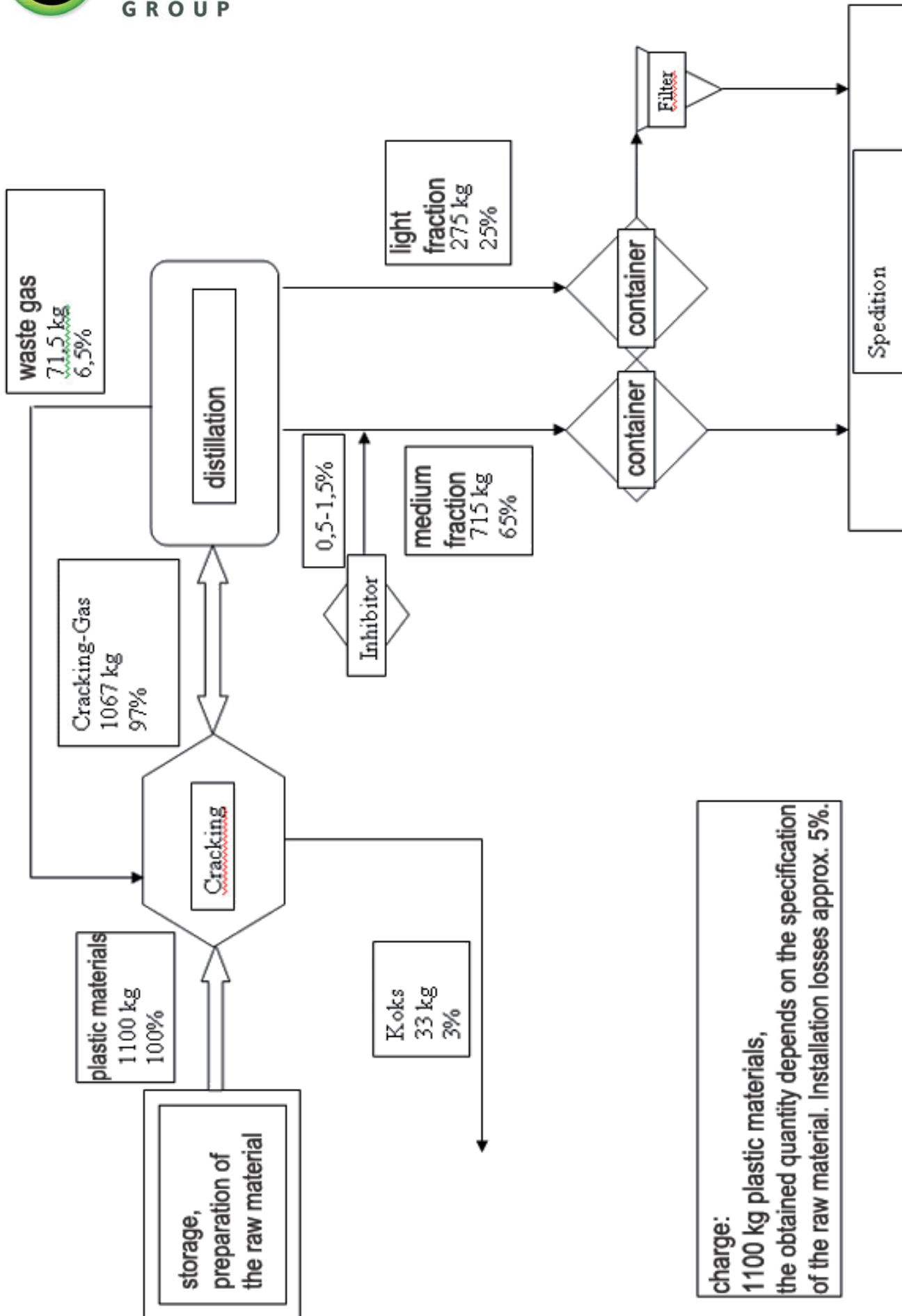
Temporary assumptions for determining the size of individual components of the installation:

- quantity of the distilled product: approx. 1000 t/month
- continuous operation: 3 8 hour-long shifts
- efficiency of the distillation installation: 1500 kg/h
- shares of the obtained products:
- gases 8%
- petrol fraction 12%
- diesel fraction 60%
- heavy oil fraction 15%
- coke 5%.



REV. 1

ZB 11.12.2004



charge:
1100 kg plastic materials,
the obtained quantity depends on the specification
of the raw material. Installation losses approx. 5%.

TECHNICAL SUPPORT:

In case of failures, breakdown or simply if you want to ask questions concerning the operation and maintenance of the installation, we will be happy to provide you with our technical support.

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