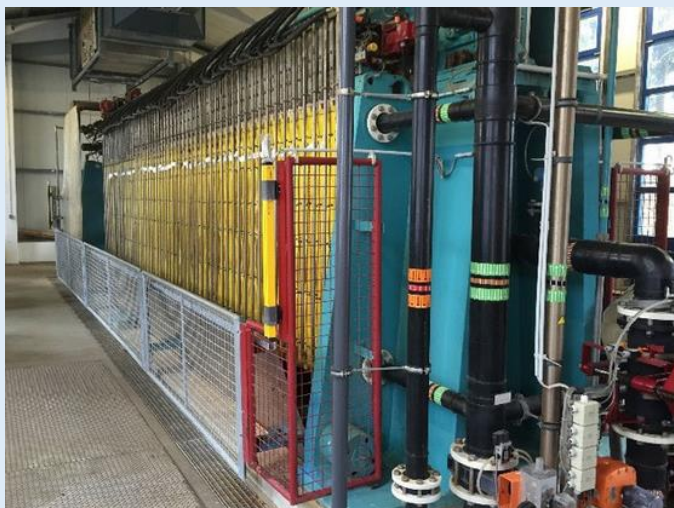


Operation of filter presses with filter elements

Guideline for:

- Analysis of plate damages at chamber- and membrane filter plates with conventional approach and demonstration of solutions
- Process engineering of membrane filter plates
 - Determination of process parameters
 - Problems – causes – solutions
- Measurement technology in the filter press on its way to “Industry 4.0“



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1. Preface

Industry 4.0 in filtration:

Filter presses with plastic plates at the beginning of the 4th industrial revolution

With regard to process engineering and handling, filter presses seem to be very simple machines at first glance. However, closer inspection shows that manifold details have to be considered for a successful operation.

The federal government's explanation of the term "Industry 4.0" is as follows:

Industry 4.0 describes the intelligent networking of machines and processes in industry with the help of information- and communications technology.

Regarding the technical point of view, the possibilities of electronic data collection and data transmission have been expanded significantly during the last years making the use of the technology more favorable.

Now, we have the possibility to screen the „Black Box“ filter press and are able to determine what happens inside and react respectively before damages at the filter may occur.

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Illus. 21: Gap washing; too high flow rate causes washing channels in the filter cake

9.2. Washing results vary according to chamber

9.2.1. Examination of cake thickness in the filter regarding equal thickness

Considering varying cake thickness in the filter press, thick filter cakes will result in a minor washing result compared to thin cakes. The reason for the varying cake thickness has to be detected in order to achieve an improvement. The measures are described in the chapter dealing with causes of varying cake thickness.

9.2.2. Examination of filter cloths for uniformity

Factors influencing cake structure e.g. the washing result are described in the chapter dealing with causes of plate cracks on chamber plates.

They can be summarized as follows:

- varying permeability of the filter cloths
- damage at filter cloths
- wrongly assembled cloths
- unsuitable cloth necks