

DWA Set of Rules

Guideline DWA-M 366E

Mechanical Dewatering of Sewage Sludge

February 2013

Maschinelle Schlammwässerung



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The German Association for Water, Wastewater and Waste (DWA) is strongly committed to the development of secure and sustainable water and waste management. As a politically and economically independent organisation it is professionally active in the field of water management, wastewater, waste and soil protection.

In Europe DWA is the association with the largest number of members within this field. Therefore it takes on a unique position in connection with professional competence regarding standardisation, professional training and information. The approximately 14,000 members represent specialists and executives from municipalities, universities, engineering offices, authorities and companies.

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Foreword

Dewatering of sewage sludge is one of the most important fundamental treatment steps in the entire sludge treatment chain. For decades, various mechanical dewatering aggregates have been operated at wastewater treatment plants. In the year 2000, the DWA-Sub-Committee KEK-2 "Stabilization, Disinfection, Conditioning, Thickening and Dewatering of Sludges" presented the Advisory Leaflet ATV-DVWK-M 366 "Mechanical Sludge Dewatering". Discussed treatment processes, their performance and their economic efficiency have been updated and are now presented in this new edition of the Guideline DWA-M 366.

The DWA-Sub-Committee KEK-2 and its Working Group KEK-2.4 "Thickening and Dewatering" have elaborated this Guideline taking into consideration the current state of science and technology, relevant legislation, and essential operational requirements. Thus a guideline related to practice has been established.

This DWA Guideline first and foremost addresses practicing professionals at wastewater treatment plants as well as planning and operating engineers and technicians.

Former Editions

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This Guideline has been elaborated by the DWA Working Group KEK-2.4 "Thickening and Dewatering" within the DWA Sub-Committee KEK-2 "Stabilisation, Disinfection, Conditioning, Thickening and Dewatering of Sludges".

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User Notes

This Guideline has been produced by a group of technical, scientific and economic experts, working in an honorary capacity and applying the rules and procedures of the DWA and the Standard DWA-A 400. Based on judicial precedent, there exists an actual presumption that this document is textually and technically correct.

Any party is free to make use of this Guideline. However, the application of its contents may also be made an obligation under the terms of legal or administrative regulations, or of a contract, or for some other legal reason.

This Guideline is an important, but not the sole, source of information for solutions to technical problems. Applying information given here does not relieve the user of responsibility for his own actions or for correctly applying this information in specific cases. This holds true in particular when it comes to respecting the margins laid down in this Guideline.

Introduction

With regard to sludge disposal, quality standards for sludge quality are rising. As a consequence suitable dewatering degrees are required for almost all sludge treatment process chains in order to achieve feed sludge qualities which are adequate for subsequent process stages (e.g. composting, drying or incineration).

In general the following treatment steps can be used for volume reduction of sludge. Water content is reduced in each one of them:

- thickening,
- dewatering,
- drying,
- incineration.

Depending on the treatment steps used, sludge liquors with varying properties are produced. These have to be taken into consideration for the operation of the wastewater treatment plant as return load (see Chapter 12). Possible combinations of the above mentioned treatment steps depend on available options for disposal or reuse. For mechanical sludge dewatering, a number of different process technologies exists. These technologies are explained in Chapter 5 and 6 of this Guideline. Before deciding on a certain process technology in an individual case, all downstream treatment steps until disposal/reuse have to be known and their requirements have to be determined. This results in the definition of the required total solids content and the desired consistency of the sludge, which are to be achieved by dewatering. Mechanical sludge dewatering requires preliminary conditioning of the sludge to be dewatered (see Chapter 4). The combination of the treatment steps conditioning and subsequent mechanical dewatering causes substantial technical and financial

expenses and thus should be investigated thoroughly beforehand. Therefore, the type of conditioning and the dewatering aggregate should be chosen carefully on the basis of analysed operation and test results. In addition to these results, also possible unfavourable cases of operation (e.g. load variations) for the dewatering aggregate should be included in the evaluation. In any case special attention should be given to operating reliability.

1 Scope

This Guideline presents recommendations for dimensioning, installation and cost-efficient operation of treatment units for mechanical sludge dewatering and addresses operators of wastewater treatment plants as well as consulting engineers. It summarizes current knowledge on principles and technologies of various dewatering procedures and includes information on operational experiences as well as costs.

This Guideline discusses in detail:

- Most frequently used dewatering aggregates where ample operational experience has been documented; these are first of all centrifuges, belt filter presses, filter presses and screw presses.
- Most commonly used conditioning processes.

For the evaluation of other dewatering or conditioning processes, assessment criteria named in each corresponding section can be used analogously.