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Guideline DWA-M 277E

Information on design of systems for the treatment and reuse of greywater and separated greywater flows

October 2017

Hinweise zur Auslegung von Anlagen zur Behandlung und Nutzung von Grauwasser und Grauwasserteilströmen
Oktober 2017

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The documents DWA-M 277 and fbr H 202 are coextensive.

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 organization it is professionally active in the field of water management, wastewater, wastes and soil protection.

In Europe DWA is the membership strongest association within this field and it takes on a unique position due to its professional competence with regard to technical regulations, professional training and information for professionals as well as the public. The approximately 14,000 members represent specialists and executives from municipalities, universities, engineering firms, authorities and companies.

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Foreword

The urban water management must address new challenges caused by heavy changes in crucial framework conditions and additional requirements regarded under sustainability criteria. Examples include the impact of demographic trends on the pipeline-bound water infrastructure, changes in precipitation regime due to climate change or the increase in the demands to improve resource efficiency. Characteristic of New Alternative Sanitation Systems (NASS) is to close the water and material cycles as far as possible with the purpose of recycling the valuable materials present in wastewater. These systems, including the necessary technical components are described in detail in one of the DWA Topics (DWA 2008). An important separated flow of the household wastewater is greywater. The potentials and technical framework for its reuse, as well as the available technologies are described in this Guideline.

An integral part of NASS is the treatment and reuse of greywater. Following numerous research projects and long-term scientific studies, industrial greywater recycling systems for the building services engineering are already available on the market. These systems cover a wide range of the greywater treatment process.

In Germany and Europe, standards for use, quality control and system comparability of greywater treatment and reuse systems hardly exist. This Guideline is the result of cooperation between the Association for Rainwater Harvesting and Water Utilisation – Darmstadt (fbr), the Training and Demonstration Centre for Decentralised Wastewater Treatment – Leipzig (BDZ) and the German Association for Water, Wastewater and Waste – Hennef (DWA). It focuses on the collection, treatment, reuse and discharge of greywater and documents the current state of knowledge of the involved institutions. The contents of this Guideline are identical with those of fbr Information Sheet H 202.

The aim of cooperation is to establish and regulate the technical basis for the installation and operation of greywater reuse systems according to their application as separated flow treatment within NASS and the current status in the building services engineering, and to introduce it to the professional public and internationally.

In this document the masculine form is used for person-specific professions and job titles to obtain a clear and reader-friendly text. This information applies equally to all genders.

Previous editions

None

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This Guideline was compiled by the DWA Working Group KA-1.2 "Greywater" within the DWA Technical Committee KA-1 "New Alternative Sanitation Systems" in cooperation with representatives of the Association for Rainwater Harvesting and Water Utilisation (fbr), the Training and Demonstration Centre for Decentralised Wastewater Treatment (BDZ) and the German Association for Water, Wastewater and Waste (DWA). This DWA Working Group consists of the following members:

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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.

1 Scope

The Guideline DWA-M 277 can be applied to systems which process and supply service water from greywater for private as well as public/commercial buildings, or which treat the greywater and drain it. These include, inter alia, single-family and two-family houses, multi-family houses and large residential complexes, administrative and training institutions. Moreover, this document can also be applied to systems used in the commercial sector such as in hotels, guest houses, sports facilities, camping sites and restaurants. This Guideline addresses architects, planners, authorities, decision-makers as well as manufacturers, executing firms and operators, who are involved in the evaluation, planning and design, operation and maintenance of such systems. The area of application with respect to the amount of greywater to be treated is not limited. The different requirements for greywater reuse in the private or public sector are described.

Since the hygienic aspects of greywater are considered of vital importance, the legal requirements for infection protection must be taken into account. The design and configuration of greywater treatment and reuse systems are dependent on the type of application.

This Guideline provides information and assistance for the planning, design, construction, operation and maintenance of greywater treatment and reuse systems for different applications, or for the purpose of discharge into a receiving water body. Systems, which do not treat the generated greywater, are not covered by this document.

In particular, the following aspects are explained:

- Definition of greywater, greywater treatment and greywater reuse;
- Establishing quality standards for service water depending on the intended use;
- Requirements for the determination of the greywater inflow and service water demand;
- Information and recommendations for the planning and technical implementation of greywater reuse systems.

All information provided in this document should be adjusted to the respective local conditions.

In the following figures, concepts for the treatment and reuse of separated greywater flows in the building services engineering (Figure 1) as well as greywater treatment for discharge purposes (Figure 2) are exemplary illustrated.