

MOBILE WASTE CONTAINER

APPLICATION OBJECTIVE - collection of waste materials from the municipal solid waste and certain commercial/ industrial waste arising in small amounts in the pick-up system

OUTLINE ON APPLICATION FRAMEWORK

PARTICULARLY APPLICABLE FOR WASTE TYPES

Glass	X	Light-weight packaging	X	Biowaste	X
Paper / paperboard	X	Mixed household waste	X	Bulky waste	
Lamps		Textiles		Electrical and electronic waste	
Scrap metal		Wood waste		C&D waste	
Waste oil		Old paint & lacquer		Waste tyres	
Hazardous waste					
Branch specific waste					
Other waste materials	X	all kinds of non-hazardous solid waste materials, which are continuously generated from a specific source in a smaller amount			

SPECIAL CHARACTERISTICS AND REQUIREMENTS OF THE APPLICATION

Pre-treatment of the input material:

not necessary, except of size reduction for oversized items to fit container dimension

Options for the utilisation of the generated output:

unlimited, no dependencies from type of container used

Protective needs:

To minimize the risk of accidents, 4-wheel container versions have to be equipped with parking breaks in order to prevent the container from rolling away on an inclined surface. Cover lids shall allow the opening also from inside the container (see RAL GZ 951/1 and 2 for reference). Only containers which are free of any cracks or damages shall be used in order to avoid containers to suddenly break and release their content during operations. No plastic containers shall be used in areas with frequent arising of hot ashes from solid fuel firing in households. Specially-shaped openings in the top lid or modifications of the throw in slot may guarantee that no other waste items than those for which the container is provided will be inserted

RESTRICTIONS OR INFLUENCE OF EXTERNALITIES ON THE APPLICATION

Infrastructural conditions:

Mobile waste containers are suitable for use in any kind of building structure; the location of the container shall ensure that moving them from the place of collection to the point for pickup is possible on a plain ground. The container site should have a paved or compacted surface to give the container a good foothold

Climatic conditions:

Where there are high proportions of biodegradable material in the waste or where kitchen/bio waste are collected via such containers, a frequent emptying (usually several times a week) should be ensured. This is especially applicable in areas with stable outside temperatures of 20 °C and higher. In cold climates there might be occasions that cover lids or the entire container gets frozen and hence cannot be opened or moved for a while.

TECHNICAL DETAILS

GENERAL OVERVIEW

ABSTRACT The mobile waste container system is the most widely used system for the collection of solid waste from households. These mobile waste containers are wheeled receptacles with volumes between 80–390 litres (2-wheelie bins) or 500-5,000 litres (4-wheelie container). Mobile waste containers are especially suited for pickup arrangements (kerbside collection) from households using a reloading procedure. In this procedure the content of the filled container is transferred (“reloaded”) into the storage body of a collection vehicle (see also fact sheets “Rear-end loader“, “Side loader“) whereby the container remains (empty) at the point of pickup/ container site.

BASIC REQUIREMENTS	<ul style="list-style-type: none"> - For picking up the waste collected with these containers, a collection vehicle usually with a lifting device (comb or Diamond type) and compaction mechanism will be needed - For emptying, containers must be exposed at a location accessible to the waste haulers or even for the vehicle itself (kerbside)
SPECIFIC ADVANTAGES	<ul style="list-style-type: none"> - Possibility to interchange container - Broad spectrum of applications for different waste materials collected from households in the pick-up system - reasonable in price due to a high degree of standardisation - compatible special versions for different applications, e.g. biowaste - available in various colours for an easy differentiation of separately collected waste fractions
SPECIFIC DISADVANTAGES	<ul style="list-style-type: none"> - no possibility for the compaction of the waste, except for some special applications in the commercial sector - risk that containers be set to fire from hot ashes or quickly igniting matter - comparatively small carrying capacity for bulky or voluminous material - emptying problems due to easy freezing of wet waste in the bin during winter season - not optimised allocation resulting in excessive number of small sized containers that leads to inefficient collection

APPLICATION DETAILS

TECHNICAL SCHEME The applications most frequently used in the pick-up system in Germany are those with a volume of 120, 240 and 1,100 litres. Standardized containers have a special fringe to permit emptying them by means of a standard lifting device attached to the collection vehicle.

Figure 1: Mobile waste container for residual waste (right), paper and paperboard (centre) and biowaste (left) (picture sources left, centre: Intecus GmbH, picture source left: Harald Heinritz, www.abfallbild.de)



4-wheel waste containers may additionally have a wheel/locking break. Moreover, containers are available with an arrestable lid to prevent an illegal use.

Figure 2: Waste container with locking break (left) and container version with arrestable lid (picture source left, right: Harald Heinritz, www.abfallbild.de)



	Other modified versions of mobile waste container include: versions made from galvanised iron sheets, with domed or flat lid, special versions for biowaste collection with aeration system, containers to be used as moveable device for manual street cleansing.
QUANTITY ASPECTS	Depending on the size of the collection area, the to-be-collected material, the vehicle and the container type used, about 250 to 900 mobile waste containers can be emptied from one collection crew during an ordinary shift.
SCALE OF APPLICATION	Mobile waste containers are suitable for use in any kind of building structure. Common sizes for these containers are within in the range of 80-390 litres volume (2-wheelie bins) or 500-5,000 litres (4-wheelie container) volume. In order to use European standard lifting devices attached to a collection vehicle for emptying, mobile waste container must have a comb fringe. A special version of lifting device, which is hardly in use, exists with the Diamond type and is used from front and side-loaded collection vehicles. Plastic containers should not be used in areas where hot ashes from solid fuel firing are usually disposed of as a waste.
INTEROPERABILITY	Emptying of mobile waste containers always requires a collection vehicle with the corresponding lifting device. The emptying of these containers with special constructional mechanisms into a roll-off or skip container is very seldom. For emptying containers of the mobile waste container type, the following lifting devices are offered in the market: <ul style="list-style-type: none"> - one-sided or double sided lifting mechanism for 2-wheel containers only, - lifting mechanism for 2 and 4-wheel containers up to 1,100 litres, - lifting mechanism for large container 1,100 up to 5,000.

OPERATIONAL BENCHMARKS: RESOURCE CONSUMPTION

HUMAN RESOURCES	The emptying is done from the crew of the collection vehicle which is usually of rear end-loaded type (see fact sheet “ Rear-end-loader ”) and staffed with 1 driver and up to 4 haulers (1+4). In an optimised collection, crew arrangements of 1+1 are possible. In areas with a lower density of waste containers side and front-loaded collection vehicles (see fact sheets, “ Side-loader ”, “ Front-loader ”) are also often in use. Here emptying of the waste container can be done from the truck driver alone.
AIDS AND ADDITIVES NEEDED	Emptying can only be done by means of a collection vehicle with the corresponding comb lifting device.

SPATIAL NEEDS Space requirements are low for containers of the type 80–240 litres. For 4-wheel containers, special attention has to be paid that the container site allows sufficient manoeuvrability. The site should be close to the kerb, be on plain, solid ground and without stairs.

Figure 3: Example of a site for mobile waste container in a densely built-up area (right) and in front of a school (left) (picture source left: Intecus GmbH, picture source right: Reinhard Weikert, www.abfallbild.de)



Table 1: Dimensions of the most common mobile waste containers

Container (l)	Height (mm)	Width (mm)	Empty weight (kg)	Max. carrying capacity (kg)
120 litre type	930	480	11	48
240 litre type	1.070	580	15	96
1,100 litre type	1.450	1.210	69	440

OPERATIONAL BENCHMARKS: COST DIMENSIONS	
INVESTMENT COSTS	<p>Investment costs for mobile waste container can range between:</p> <ul style="list-style-type: none"> - 80-120 litre type: 15–35 EUR - 240 litre type: 22–45 EUR - 1,100 litre type: from 160 EUR <p>The presented prices can only be provided if a minimum order of 10,000 pieces of 2- wheel or 1,000 pieces of 4-wheel containers is assured. Die dargestellten Preisspannen setzen eine Mindestabnahmemenge von mehreren 1.000 Stück voraus. The costs for gravity locks are at about 25 Euros for a 2 wheel bin and 55 Euros for a 4 wheel container, respectively.</p>
OPERATING COSTS	<ul style="list-style-type: none"> - repair and maintenance (cleansing) services: 11 % of the investment/a - other specially requested services, such as subsequent modifications
MISCELLANEOUS	
MARKET INFORMATION	
REFERENCE FACILITIES	<p>Mobile waste containers are the most widely applied type of receptacles for the collection and temporary storage of solid waste materials from households before pickup and disposal. They are in worldwide use. In Germany, mobile waste containers with a volume of 80, 120, 240 and 1,100 litres are most common.</p>
RECOGNIZED PRODUCER AND PROVIDER FIRMS <i>(important note: the list of firms does not constitute a complete compilation of companies active in the specified fields)</i>	<p>Manufacturers/suppliers for these type containers exist in Germany in a larger number. Some of the most prominent are for example:</p> <ul style="list-style-type: none"> - SULO Umwelttechnik GmbH & Co. KG, Herford, www.sulo-umwelttechnik.de - ESE GmbH, Neuruppin www.es.com - SSI Schäfer- Fritz Schäfer GmbH, Neunkirchen www.ssi-schaefer.de - Paul Craemer GmbH, Herzebrock-Clarholz www.craemer.de
REMARKS AND REFERENCE DOCUMENTS	
<p>Further information and a list of firms concerning the different applications, the use and necessary precautions to be made for this type containers can be obtained in Germany from:</p> <ul style="list-style-type: none"> - Gütegemeinschaft Abfall- und Wertstoffbehälter e.V., Siegburger Straße, Köln www.ggawb.com <p>Reference for applicable norms/standards in Germany:</p> <ul style="list-style-type: none"> - DIN EN 840-1 to 6: Mobile waste containers - dimensions and design, performance requirements and test methods, safety and health requirements - DIN 30760: Mobile waste containers – Waste containers with two wheels with a capacity from 60 l to 360 l for diamond lifting devices - RAL-GZ 951/1 – Waste and Recycling Material Containers made of Plastic Material Quality Assessment - RAL-GZ 951/2 – Waste and Recycling Material Containers made of Metal Quality Assessment - Introduction of quality label RAL-GZ AWB - VDI Guideline 2160: Waste management in building and on ground - Requirement for bins, locations and transportation routes 	