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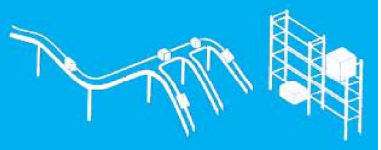
Intralogistics Systems



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Energy consumption – determination methods (ECoDeMISE)

- Calculation, measurement and evaluation methods of Intralogistics Systems and material handling equipment -

Available in English (E)

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1 Introduction and aims

Due to the decrease of remaining raw material and energy resources on earth and the increase of raw material and energy prices, challenges concerning the environmental sustainability of systems arise. Customer expectations and more restrictive laws regarding the energy consumption of material handling equipment and intralogistics systems put pressure on producing and operating companies.

The intralogistics industry, however, has voluntarily taken the stance on promoting the energy consumption of material handling equipment and intralogistics systems in terms of the Kyoto protocol. Future, more extensive regulations are to be expected, which may also include obliging rules for other engineering industries.

All these facts call for a new benchmarking system, balancing economics and ecologies. To implement generally valid benchmarks for the environmental sustainability of intralogistics systems, a new standardized and transparent process is required. However, to assess an intralogistics system, various types of material handling equipment must be considered. This recommendation aims to provide a guideline for standardized calculation and measurement of the energy consumption for various material handling systems including, subsystems, modules and components.

Thus, in the recommendation “Energy consumption – determination methods (ECoDeMISE) - Calculation, measurement and evaluation methods of Intralogistics Systems and material handling equipment” the main chapter “Determination process” contains the procedure of determination of the energy value of a system, which includes several subsystems, modules and components.

In the chapter “determination process” four possibilities for determination of the energy consumption value are given. For contractor’s standard equipment basic and advance calculation methods are named. For that, general chapters for the used methods for calculation, measurement and evaluation of the energy consumption of intralogistics modules and components are the first part of the recommendation. Afterwards detailed chapters for several material handling modules and subsystems, i.e. sorting subsystems or shuttle subsystems, according to calculation and measurements of energy consumption of the single devices are given.

2 Scope of recommendation

The terms and procedures defined in this recommendation are applicable to a broad variety of industries using intralogistics systems, ranging from warehouses, airport baggage handling systems or parcel sorting systems. The measurement and calculation recommendations are intended for planners, manufacturers and purchasers of intralogistics systems and aim to enable a methodical approach to calculate and measure the energy consumption of intralogistics systems including subsystems, modules and components.

To provide a recommendation with a clear set of actions and guidance, the awareness for scope limitations is important. For the analysis, the following restrictions have been defined:

- The outcome of the calculations and measurements is the electrical energy consumption described in kWh of the ECoDeMISE scenario. The estimation is not transferable to the annual consumption of the system.
- The focus of this recommendation is on energy consumption. Peaks (and power supply size) during a day are part of the value of the energy consumption but not considered in detail in this recommendation.
- As a matter of principle, this standard assumes professional installation and maintenance. The results in this recommendation were achieved by systems with less than 1.000 operating hours.
- Installation workmanship has a significant impact on the energy demand; as a matter of principle, this standard assumes professional installation and maintenance.

The recommendation is focused on the Basic-Calculation and the Advanced-Calculation method. There, the main formulas and assumptions are set and the user gets a helpful example how to calculate the energy consumption by itself. The recommendation also includes a method for measurements on installed systems. The measurement method is described for modules as well as for complete systems. Afterwards a method for comparison of the calculated energy consumption with the measured data is given, so that the reliability of the calculation is shown.