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Förpackningar – Återanvändning – Metoder för beräkning av återanvändningsgrad

Packaging – Reuse – Methods for assessing the performance of a reuse system

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Denna tekniska rapport ersätter SIS-CEN/TR 14520:2005, utgåva 1.

This Technical Report is not a Swedish Standard. This document contains the English version of CEN/TR 14520:2007.

This Technical Report supersedes SIS-CEN/TR 14520:2005, edition 1.

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 14520

July 2007

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English Version

Packaging - Reuse - Methods for assessing the performance of a reuse system

Emballage - Réutilisation - Méthode d'évaluation de la performance d'un système de réutilisation

Verpackung - Wiederverwendung - Verfahren zur Einschätzung der Leistungsfähigkeit eines Wiederverwendungssystems

This Technical Report was approved by CEN on 25 May 2007. It has been drawn up by the Technical Committee CEN/TC 261.

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Foreword

This document (CEN/TR 14520:2007) has been prepared by Technical Committee CEN/TC 261 “Packaging”, the secretariat of which is held by AFNOR.

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Introduction

The methods set out in this Technical Report are both capable of giving realistic results in the relevant circumstances. Experience over time with the results will indicate the levels of performance that are being achieved.

1 Scope

This Technical Report gives methods of assessing the performance of a reuse system related to the proportion of reused packaging in use. This may be measured by:

— the average number of rotations during a calculation period and the lifetime; or

— the reuse ratio.

The choice of method will vary according to the type of reuse system and information available.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
trip
transfer of packaging, from filling/loading to emptying/unloading. A trip can be part of a rotation

2.2
rotation
cycle undergone by reusable packaging from filling/loading to filling/loading. A rotation will always contain a trip

2.3
population
total number of a packaging type, empty or filled, in that whole reuse system

2.4
claiming company
packer/filler who is making a claim of ‘reusable’ for a type of packaging, in the circumstances of its intended use

2.5
reuse ratio
ratio, expressed as a percentage, of the number of movements of reused packaging to the number of movements of all the packaging at the measurement point (see definition 2.7) over the calculation period (see definition 2.6)

2.6
calculation period
period over which the number of trips or reuse ratio is calculated

NOTE This should be of adequate duration to smooth out the effects of seasonal variation, product lifetime, packaging inputs and other factors which can affect the calculation.

2.7
measurement point
point in the rotation loop at which the information for the calculation is gathered

NOTE Examples of some possible measurement points are given in 4.2.

2.8
newly manufactured packaging
newly purchased packaging entering the system for the first time to increase the population or replace all types of losses

2.9
system adjustment
increase or decrease of population of a packaging type due to market fluctuation

2.10
system losses
all types of losses of packaging from the system

2.11
closed loop system
system in which reusable packaging is circulated by a company or a co-operating group of companies

2.12
open loop system
system in which reusable packaging circulates amongst unspecified companies

2.13
hybrid system
system consisting of two parts:

a) reusable packaging, remaining with the end user, for which there exists no redistribution system leading to commercial refilling;

b) one way packaging, used as an auxiliary product to transport the contents to the reusable packaging

2.14
lifetime
period from the first use of the packaging until it is no longer in use and becomes waste

3 Methods of calculation

3.1 Open and closed loop systems

3.1.1 Principle

The performance of a reuse system can be evaluated by calculating either the average number of rotations (see definition 2.2) or the reuse ratio. The population figure needs to be known accurately to perform the calculation of the average number of rotations. In the cases where this value can not be known, which includes most open loop systems, only the reuse ratio can be calculated.

NOTE The packer/filler making the calculation will require the co-operation of all other partners in the system for that product. See EN 13429:2004, 5.1.

3.1.2 Calculation of average number of rotations in the system during the calculation period

The simple equation to determine the average number of rotations of packaging in the system during the calculation period is:

$$N_p = \frac{Q_{sp}}{P_t}$$

where

N_p is the average number of rotations during the calculation period;

Q_{sp} is the total number of movements of packaging through the measurement point during the calculation period;

NOTE 1 For pool systems this is the sum of all the packaging from all the packer/fillers.

P_t is the average population during the calculation period.

Q_{sp} can often be easily calculated from the number of despatches or output from the packer/filler etc. However P_t is rarely directly known and has to be calculated. A simplified version of this calculation is:

$$P_t = P_{in} + \frac{P_{new}}{2} - \frac{P_{loss}}{2} - \frac{P_{adj}}{2}$$

where

P_t is the average population during the calculation period;

P_{in} is the population at the start of the calculation period;

P_{new} is the total of newly manufactured packaging entering the system during the calculation period;

P_{loss} is the system losses during the calculation period;

P_{adj} is the system adjustments during the calculation period.

NOTE 2 System adjustments take place when packaging is deliberately withdrawn from the system, for instance in the case of a fall in demand.

P_{new}, P_{loss} and P_{adj} are divided by two to give an approximate average over the calculation period. Where possible a more accurate average should be used.

P_{new} and P_{adj} are often known, however P_{loss} generally has to be assessed. Under long term steady state conditions, P_{loss} is approximately equal to P_{new}.

3.1.3 Calculation of reuse ratio

$$R_r = \frac{Q_{reuse}}{Q_{sp}} \times 100$$

where

R_r is the reuse ratio;

Q_{reuse} is the total number of movements of reused packages through the measurement point during the calculation period;

Q_{sp} is the total number of movements of packaging through the measurement point during the calculation period.

In systems where only the reuse ratio can be calculated it should be noted that any percentage greater than zero is evidence of reuse.