CEN REPORT

RAPPORT CEN

CEN BERICHT

CR 14378

January 2002

ICS

English version

Ventilation for buildings - Experimental determination of mechanical energy loss coefficients of air handling components

This CEN Report was approved by CEN on 10 November 2001. It has been drawn up by the Technical Committee CEN/TC 156.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Ref. No. CR 14378:2002 E

CONTENTS

Foreword

This Technical Report has been prepared by Technical Committee CEN/TC 156, 'Ventilation for buildings', the secretariat of which is held by BSI.

This report should be considered with a series of standards for ductwork used for ventilation and air conditioning of buildings for human occupancy.

The position of this report in the field of mechanical building services is shown in Figure 1.

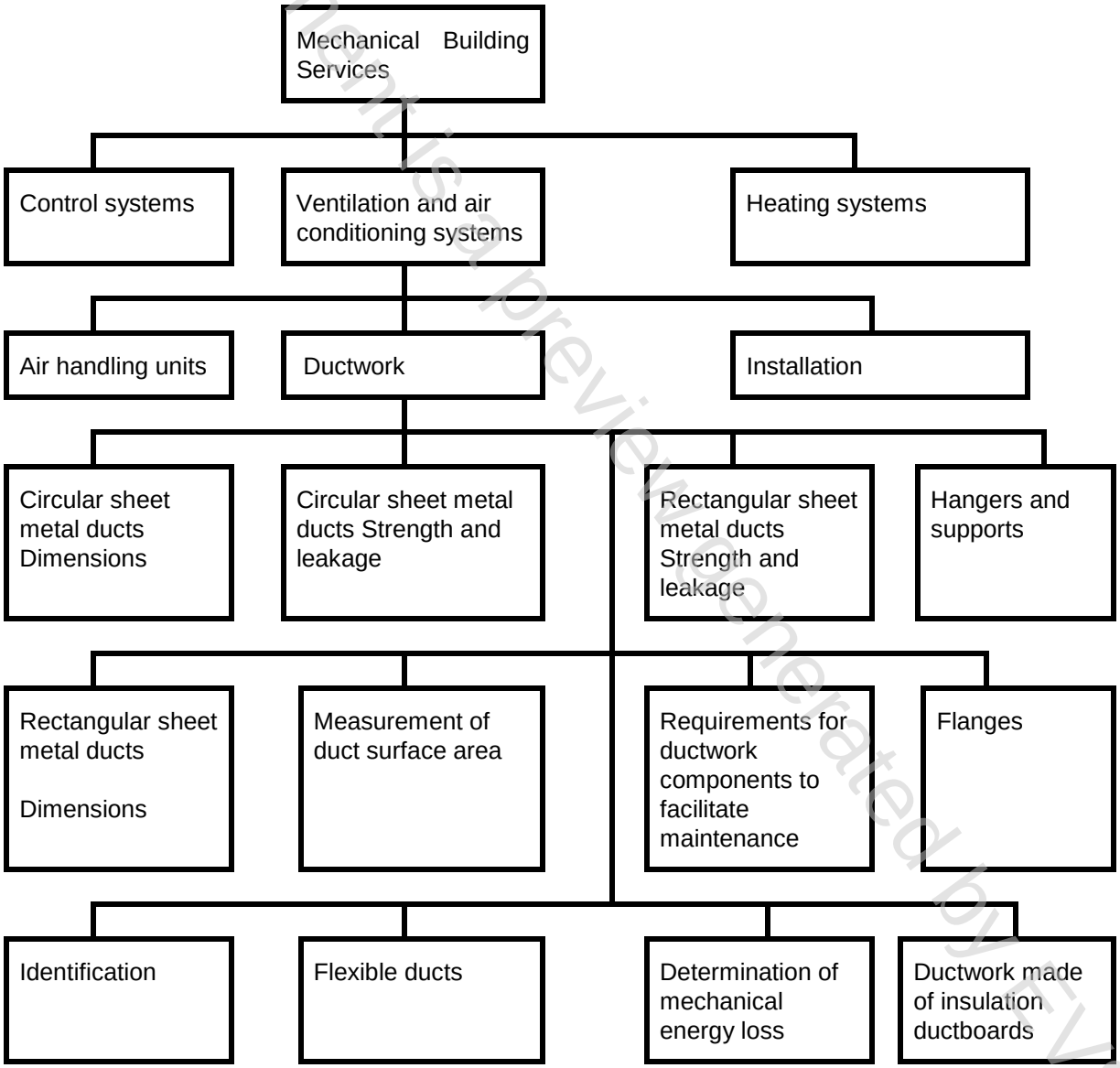

Figure 1 - Position of CR 14378 in the field of mechanical building services

1 Scope

This Technical Report specifies unified test procedures and conditions for the experimental determination of mechanical energy loss coefficients for ductwork components such as ducts, bends, diffusors, converging junctions and diverging junctions.

2 Normative references

This Technical Report incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references the subsequent amendments to or revisions of any of these publications apply to this Technical Report only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

CR 12792 Ventilation for buildings Symbols, units and terminology

ISO 5221 Air flow measurement in an air handling duct.

3 Terms and definitions

For the purposes of this report, the terms and definitions and symbols are principally in accordance with CEN Technical Report CR 12792.

4 Test method

4.1 Principle

In principle it is possible to give a definition of energy loss produced by a component of air distribution systems.

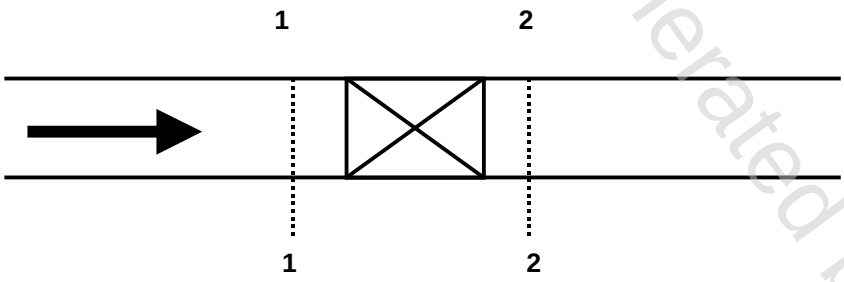

Figure 2 - Diagrammatic representation of energy flow

The mechanical energy loss in the flow within a typical component, as represented in Figure 2, is equal to the difference between the energy entering the component through section I and the energy leaving the component through section 2.

By applying the generalized Bernoulli formula which takes into account the fact that the air is compressible, therefore its density varies through the component, and that it is a real fluid, the velocity distribution in a section being non-uniform, the energy loss per unit mass (J/kg) is expressed by: