Corrigendum
(October 2022)

Determination of Chemical Emission Rates from Electronic Equipment– Part 1
(using consumables)
Introduction

Globally, governmental agencies, academic institutions, environmental organizations and manufacturers have started to develop methods to determine chemical emissions from electronic equipment. These attempts however, initially resulted in a range of tests from which the results were not necessarily comparable, either qualitatively or quantitatively.

Following the publications of the 1st edition of ECMA-328 in 2001 and the “Test method for the determination of emissions from Hard Copy Devices” (RAL-UZ 122), experts from BAM and Ecma have collaborated to harmonise methods to determine the chemical emission rates from ICT & CE equipment in the 2nd edition.

In addition to stricter test procedures, the 2nd edition used generalised emission formulae, and their derivations developed in Annex C, to calculate emission rates from concentrations of analytes that are measured in Emission Test Chambers.


In addition, the 4th edition fixed a number of errata on ISO/IEC 28360:2007 that JTC 1/SC 28 identified.

Following the publications of the 4th edition of ECMA-328 and the “Test method for the determination of emissions from Hard Copy Devices” (RAL-UZ 122), experts from BAM, WKI, JBMIA and Ecma have collaborated to harmonise methods to determine the Fine Particle (FP) and Ultrafine Particle (UFP) emissions from hard copy devices in the 5th edition.


The 7th edition of ECMA-328 is fully aligned with ISO/IEC 28360:2015.

The 8th edition was divided into two parts, a part for electronic equipment using consumables and a part for electronic equipment not using consumables:

- Determination of Chemical Emission Rates from Electronic Equipment – Part 1 (using consumables)
- Determination of Chemical Emission Rates from Electronic Equipment – Part 2 (not using consumables)

The purpose of the split was to make the description of test procedures simpler (they included considerable differences between the two equipment categories) and to facilitate users’ understanding.

This 8th edition is fully aligned with “Test method for the determination of emission from Hard Copy Devices” (RAL-UZ 205).


The 10th edition has been re-organised to incorporate RAL-UZ Options into the main text as one of the two methods for determining emission rates of VOC and carbonyl compounds.

One method (OEM), which is in harmony with DE-UZ 205¹, Test Method for the Determination of Emissions from Hardcopy Devices (Appendix S-M), originates from the former RAL-UZ 205 Options. The other method (CEM) employs the generalised constant emission model in the former editions. The two methods may yield
slightly different emission rates, so the user is encouraged to select the one that satisfies their technical application.

Different elements of the two methods are described alongside each other in the main text. The models used to calculate emission rates in each method are explained in the informative Annexes C and D. Some requirements in the former RAL-UZ Options which appear too detailed and stringent as an international standard are now listed in the informative Annex E so that users can fully meet the requirements of DE-UZ 205¹ (Appendix S-M).

In this edition, it is deduced in the CEM that emission rates of VOC and carbonyl compounds during the operating phase (SER_{ope}) originate from the pre-operating phase (SER_{pre}) and printing (SER_{prp}) operations as well as in the QEM and the former RAL-UZ Options.

This document is an editorial corrigendum to ECMA-328 Part 1.

¹ The German Blue Angel Environmental Label changed the naming convention of its award criteria from RAL-UZ 205 to DE-UZ 205 in 2019.
COPYRIGHT NOTICE

© 2022 Ecma International

This document may be copied, published and distributed to others, and certain derivative works of it may be prepared, copied, published, and distributed, in whole or in part, provided that the above copyright notice and this Copyright License and Disclaimer are included on all such copies and derivative works. The only derivative works that are permissible under this Copyright License and Disclaimer are:

(i) works which incorporate all or portion of this document for the purpose of providing commentary or explanation (such as an annotated version of the document),

(ii) works which incorporate all or portion of this document for the purpose of incorporating features that provide accessibility,

(iii) translations of this document into languages other than English and into different formats and

(iv) works by making use of this specification in standard conformant products by implementing (e.g. by copy and paste wholly or partly) the functionality therein.

However, the content of this document itself may not be modified in any way, including by removing the copyright notice or references to Ecma International, except as required to translate it into languages other than English or into a different format.

The official version of an Ecma International document is the English language version on the Ecma International website. In the event of discrepancies between a translated version and the official version, the official version shall govern.

The limited permissions granted above are perpetual and will not be revoked by Ecma International or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and ECMA INTERNATIONAL DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY OWNERSHIP RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
Part 1

Determination of Chemical Emission Rates from Electronic Equipment (using consumables)

1 Introduction

This document corrects several editorial or typographical errors in ECMA-328, Determination of chemical emission rates from electronic equipment - Part 1, Using consumables - 10th edition, December 2020.

A line was missing in the first box of Figure 1.

The informative annexes C and D had several typographical or cross-reference errors in the text explaining some of the equations.

**Correction 1**

*Clause 6 Method overview*

*Figure 1*

Section 8.2.2 is missing in the second box of Figure 1.

“Loading factor (8.2.2)” should be added below “Ensure Test conditions (8.1)”. 
**Correction 2**

**Annex C.5.2 Emission during operating phase**

The explanation of Equation (C.26) is wrong.

"Insert $C_{pre}$ in (C.4) in (C.26):"

should be replaced by:

"Insert $C_{pre}$ in (C.4) in (C.25):"
Correction 3
Annex C.5.2 Emission during operating phase
The explanation of Equation (C.27) is wrong:

Insert \( C_0 \) in (C.27) in (C.22) and rearrange for \( \text{SER}_{\text{opr}} \):
should be replaced by:
Insert \( C_0 \) in (C.26) in (C.24) and rearrange for \( \text{SER}_{\text{opr}} \):

Correction 4
Annex D.2 Approach
Figure C.1 is a typo, correct reference is to Figure D.1

“The areas of concentration regions during the operating and post-operating phases in Figure C.1 (a) and (b) must be calculated to determine the emission rate during the operating-phase (\( \text{SER}_{\text{ope}} \)).”
should be corrected as:
“The areas of concentration regions during the operating and post-operating phases in Figure D.1 (a) and (b) must be calculated to determine the emission rate during the operating-phase (\( \text{SER}_{\text{ope}} \)).”

Correction 5
Annex D.5.2 Emission during operating and post-operating phase
In the explanation leading to Equation (D13), Figure C.1 is a typo, correct reference is to Figure D.1

In Figure C.1, the terms from m1 to m4 denote the regions and their areas shaped between the build-up and decaying concentration curves which stem from each source, and the time periods of the phases under consideration.
should be corrected as:
In Figure D.1, the terms from m1 to m4 denote the regions and their areas shaped between the build-up and decaying concentration curves which stem from each source, and the time periods of the phases under consideration.

Correction 6
Annex D.5.2 Emission during operating and post-operating phase
Correction of symbols in the explanation leading to Equation (D26)

In such cases, \( C_0 \) is obtained as the sum of the two concentrations, one of which decays from the concentration at the end of the pre-operating phase with air exchange while the other builds up with the continuing emission during that period of time (\( t_s \)):
should be corrected as:
In such cases, \( C_0 \) is obtained as the sum of the two concentrations, one of which decays from the concentration at the end of the pre-operating phase with air exchange while the other builds up with the continuing emission during that period of time (\( t_s \)):

Correction 7
Annex D.5.2 Emission during operating and post-operating phase
Correction of symbols. (Subscript) in the explanation of “Equation (D.24) reshown”:

“If the stabilizing period (\( t_s \)) is relatively long (\( n*t_s\geq3 \)), (D.26) is reduced to:”
should be replaced by:
“If the stabilizing period \( t_s \) is relatively long \( (n^*t_s \geq 3) \), (D.26) is reduced to:”