

---

---

**Information technology — Print  
cartridge characterization —**

**Part 1:  
General: terms, symbols, notations  
and cartridge characterization  
framework**

*Technologies de l'information — Caractérisation des cartouches  
d'impression —*

*Partie 1: Généralités : termes, symboles, notations et cadre pour la  
caractérisation des cartouches*

ISO/IEC 29142-1:2021

<https://standards.iteh.ai/catalog/standards/iso/593ee59e-597c-4a5b-bd18-e9001ed90e86/iso-iec-29142-1-2021>



**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/IEC 29142-1:2021](https://standards.iteh.ai/catalog/standards/iso/593ee59e-597c-4a5b-bd18-e9001ed90e86/iso-iec-29142-1-2021)

<https://standards.iteh.ai/catalog/standards/iso/593ee59e-597c-4a5b-bd18-e9001ed90e86/iso-iec-29142-1-2021>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier; Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Requirements</b> .....	<b>8</b>
<b>5 Structure of the ISO/IEC 29142 series</b> .....	<b>8</b>
5.1 Data reporting.....	8
5.2 Environmental.....	8
5.3 Toner and ink cartridge characterization.....	9
<b>6 Framework overview for cartridge characterization</b> .....	<b>9</b>
6.1 Elements of a print system.....	9
6.2 Cartridge configurations.....	10
6.3 Performance attributes measured on a printed page.....	10
6.4 Physical attributes.....	11
<b>7 Attribute framework for testing and characterizing cartridges</b> .....	<b>11</b>
7.1 Overview.....	11
7.2 Special considerations for binomial and continuous performance point attributes.....	13
7.3 Special considerations for point and lifetime binomial attributes.....	13
7.4 Special considerations for performance testing with page-attribute values.....	13
7.5 Test requirements for all attributes.....	16
7.5.1 Set-up.....	16
7.5.2 Sample size for continuous attributes.....	16
7.5.3 Sample size for binomial attributes.....	16
7.5.4 Additional cartridge sampling considerations.....	17
7.5.5 Print and test environment.....	17
7.5.6 Paper.....	18
7.5.7 Maintenance.....	18
7.5.8 Test chart files.....	18
7.6 Test methodology for lifetime and point attributes.....	19
7.6.1 Sample interval for printing test charts.....	19
7.6.2 Test sample frequency calculation for attributes tested in a life test process.....	20
7.6.3 Testing procedure.....	20
7.6.4 Conditioning and measurement of test chart components for page-attribute values.....	20
7.6.5 Procedure for handling a defective cartridge or printer.....	22
<b>8 Framework requirements for determination of declared attribute values</b> .....	<b>22</b>
8.1 Determination of the declared value for continuous lifetime or continuous physical attributes.....	22
8.2 Determination of the declared value for continuous point attributes.....	23
8.3 Determination of the declared value for lifetime, point and physical binomial attributes.....	25
<b>9 Framework requirements for reporting cartridge-characterization results</b> .....	<b>25</b>
<b>Annex A (informative) Terms cross-reference</b> .....	<b>26</b>
<b>Bibliography</b> .....	<b>29</b>

## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives) or [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)) or the IEC list of patent declarations received (see [patents.iec.ch](http://patents.iec.ch)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html). In the IEC, see [www.iec.ch/understanding-standards](http://www.iec.ch/understanding-standards).

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 28, *Office equipment*.

This second edition cancels and replaces the first edition (ISO/IEC 29142-1:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

- revision of the term “black-only printer” in order to harmonize with ISO/IEC 22505.

A list of all parts in the ISO/IEC 29142 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://www.iec.ch/national-committees).

## Introduction

The purpose of this document is to define the framework for characterizing ink and toner cartridges used in printing devices that have a digital input printing path, including multi-function devices. This document defines terms, symbols, and notations used throughout the ISO/IEC 29142 series to characterize such ink and toner cartridges.

Customer information related to ink and toner cartridges is not consistent in the global marketplace.

Cartridge manufacturers, including original, non-original manufacturers, refillers, and remanufacturers, have each communicated expressions of cartridge characteristics.

The ISO/IEC 29142 series is provided to aid transparency between manufacturers, suppliers and their customers regarding selected cartridge characteristics. The selected cartridge characteristics do not allow an exhaustive cartridge characterization. Where applicable, cartridge attributes and the associated characterization tests are used consistently with both ink and toner cartridge technologies. The selected cartridge attributes are defined for all cartridges, regardless of manufacturing methodology.

# iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ISO/IEC 29142-1:2021](https://standards.iteh.ai/catalog/standards/iso/593ee59e-597c-4a5b-bd18-e9001ed90e86/iso-iec-29142-1-2021)

<https://standards.iteh.ai/catalog/standards/iso/593ee59e-597c-4a5b-bd18-e9001ed90e86/iso-iec-29142-1-2021>