
**Information technology — Data
interchange on 12,7 mm 128-track
magnetic tape cartridges — DLT 3-XT
format**

*Technologies de l'information — Échange de données sur cartouches
de bande magnétique de 12,7 mm, 128 pistes — Format DLT 3-XT*

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 1999

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Section 1 - General	1
1 Scope	1
2 Conformance	1
2.1 Magnetic tape cartridges	1
2.2 Generating systems	1
2.3 Receiving systems	1
3 Normative references	1
4 Definitions	2
4.1 Average Signal Amplitude	2
4.2 azimuth	2
4.3 back surface	2
4.4 Beginning-Of-Tape markers (BOT 1 and BOT 2)	2
4.5 byte	2
4.6 cartridge	2
4.7 Cyclic Redundancy Check (CRC) character	2
4.8 Early Warning (EW)	2
4.9 Error-Detecting Code (EDC)	2
4.10 End-Of-Tape marker (EOT)	2
4.11 Entity	2
4.12 Error-Correcting Code (ECC)	2
4.13 flux transition position	2
4.14 flux transition spacing	2
4.15 Logical Block	2
4.16 logical track	2
4.17 magnetic tape	2
4.18 Master Standard Reference Tape	2
4.19 object	2
4.20 page	2
4.21 physical block	2
4.22 physical recording density	2
4.23 physical track	2
4.24 Record	2
4.25 Reference Edge	2
4.26 Reference Field	2
4.27 Secondary Standard Reference Tape	2
4.28 Standard Reference Amplitude (SRA)	3
4.29 Standard Reference Current	3

4.30 Test Recording Current	3
4.31 Typical Field	3
5 Conventions and notations	3
5.1 Representation of numbers	3
5.2 Dimensions	3
5.3 Names	3
5.4 Acronyms	3
6 Environment and safety	3
6.1 Cartridge and tape testing environment	4
6.2 Cartridge operating environment	4
6.3 Cartridge storage environment	4
6.4 Safety	4
6.4.1 Safeness	4
6.4.2 Flammability	4
6.5 Transportation	4
Section 2 - Requirements for the unrecorded tape	5
7 Mechanical and electrical requirements	5
7.1 Material	5
7.2 Tape length	5
7.3 Width	5
7.4 Total thickness	5
7.5 Discontinuity	5
7.6 Longitudinal curvature	5
7.6.1 Requirement	5
7.6.2 Procedure	5
7.7 Out-of-Plane distortions	5
7.8 Cupping	5
7.9 Roughness of the coating surfaces	5
7.9.1 Roughness of the back coating surface	5
7.9.2 Roughness of the magnetic coating surface	5
7.10 Coating adhesion	6
7.11 Layer-to-layer adhesion	6
7.11.1 Requirements	6
7.11.2 Procedure	6
7.12 Modulus of elasticity	7
7.12.1 Requirement	7
7.12.2 Procedure	7
7.13 Flexural rigidity	7
7.13.1 Requirement	7
7.13.2 Procedure	8
7.14 Tensile yield force	8
7.14.1 Procedure	8
7.15 Electrical resistance	8
7.16.1 Requirement	8
7.15.2 Procedure	8
7.16 Inhibitor tape	9
7.17 Abrasivity	9
7.17.1 Requirement	9
7.17.2 Procedure	9
7.18 Light transmittance of the tape and the leader	9
7.19 Coefficient of dynamic friction	9
7.19.1 Requirements	9
7.19.2 Procedure for the measurement of the friction between the magnetic surface and the back surface	10

7.19.3 Procedure for the measurement of the friction between the magnetic surface or the back surface and calcium titanate ceramic	10
8 Magnetic recording characteristics	10
8.1 Typical Field	11
8.2 Signal amplitude	11
8.3 Resolution	11
8.4 Overwrite	11
8.4.1 Requirement	11
8.5 Peak shift	11
8.5.1 Requirement	11
8.5.2 Procedure	11
9 Tape quality	12
9.1 Missing pulses	12
9.1.1 Requirement	12
9.2 Missing pulse zone	12
9.2.1 Requirement	12
9.3 Tape durability	12
Section 3 - Mechanical specifications of the tape cartridge	12
10 General	12
10.1 Bottom side and right side	13
10.2 Back side and left side	14
10.3 Tape reel	14
10.4 Tape leader and markers	15
10.5 Front side	16
10.6 Operation of the cartridge	16
10.7 Tape winding	17
10.8 Moment of inertia	17
10.9 Material	17
11 Method of recording	26
11.1 Physical recording density	26
11.2 Channel bit cell length	26
11.2.1 Average Channel bit cell length	26
11.2.2 Long-term average Channel bit cell length	26
11.2.3 Short-term average Channel bit cell length	26
11.3 Flux transition spacing	26
11.4 Read signal amplitude	26
11.5 Azimuth	27
11.6 Channel skew	27
12 Tape format	27
12.1 Reference Edge	27
12.2 Direction of recording	27
12.3 Tape layout	27
12.4 Calibration and Directory Area	27
12.4.1 Scratch Area	28
12.4.2 Guard Area G1	28
12.4.3 Calibration Tracks Area	28
12.4.4 Guard Area G2	29
12.4.5 Directory Area	29
12.4.6 Guard Area G3	29
12.5 Data Area	29
12.5.1 Physical tracks	30
12.5.2 Width of the physical tracks	30

12.5.3	Logical tracks	30
12.5.4	Locations of the physical tracks	30
12.5.5	Layout of tracks in the Data Area	31
13	Data format	31
13.1	Data Bytes	32
13.2	Logical Blocks	32
13.3	Data Blocks	32
13.4	Types of Logical Blocks	32
13.5	Entities	32
13.6	Logical Block format	32
13.6.1	Preamble	33
13.6.2	Sync	33
13.6.3	Data Field	33
13.6.4	EDC	35
13.6.5	Control Field 1 (CF1)	35
13.6.6	Control Field 2 (CF2)	36
13.6.7	CRC	37
13.6.8	Postamble	37
14	Use of Logical Blocks	37
14.1	Data Blocks	37
14.2	Filler Blocks	37
14.3	End of Track Blocks (EOTR)	38
14.4	End of Data Blocks (EOD)	38
14.5	ECC Blocks	38
15	Format of Entities	38
16	Error handling	38
 Annexes		
A	- Measurement of light transmittance	39
B	- Generation of the Data Block CRCs	42
C	- ECC generation	43
D	- Generation of page CRCs	46
E	- Format of MAP entries	47
F	- Format of Control Field 1	48
G	- Format of Control Field 2	49
H	- Recommendations for transportation	50
J	- Inhibitor tape	51
K	- Recommendations on tape durability	52
L	- Handling guidelines	53

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 15895 was prepared by *ECMA — European association for standardizing information and communication systems* (as ECMA-258) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annexes A to G form a normative part of this International Standard. Annexes H to L are for information only.

Introduction

This International Standard constitutes a further development of the magnetic tape cartridge specified in International Standard ISO/IEC 14833. A higher capacity is achieved by using a thinner, thus longer tape.

Information technology - Data interchange on 12,7 mm 128-track magnetic tape cartridges - DLT 3-XT format

Section 1 - General

1 Scope

This International Standard specifies the physical and magnetic characteristics of a 12,7 mm wide, 128-track magnetic tape cartridge, to enable physical interchangeability of such cartridges between drives. It also specifies the quality of the recorded signals, a format - called Digital Linear Tape 3 Extended (DLT 3-XT) - and a recording method, thereby allowing data interchange between drives. Together with a labelling standard, for instance International Standard ISO 1001 for Magnetic Tape Labelling, it allows full data interchange by means of such magnetic tape cartridges.

2 Conformance

2.1 Magnetic tape cartridges

A magnetic tape cartridge shall be in conformance with this International Standard if it satisfies all mandatory requirements of this International Standard. The tape requirements shall be satisfied throughout the extent of the tape.

2.2 Generating systems

A system generating a magnetic tape cartridge for interchange shall be entitled to claim conformance with this International Standard if all the recordings that it makes on a tape according to 2.1 meet the mandatory requirements of this International Standard.

In addition a claim of conformance shall state

- whether or not one, or more registered algorithm(s) are implemented within the system, and are able to compress data received from the host prior to collecting data into blocks, and
- the registered identification number(s) of the implemented algorithm(s)

2.3 Receiving systems

A system receiving a magnetic tape cartridge for interchange shall be entitled to claim conformance with this International Standard if it is able to handle any recording made on a tape according to 2.1.

In addition a claim of conformance shall state

- whether or not one, or more de-compression algorithm(s) are implemented within the system, and are able to be applied to de-compress data prior to making such data available to the host, and
- the registered identification number(s) of the implemented algorithm(s)

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1001:1986	<i>Information processing - File structure and labelling of magnetic tapes for information interchange.</i>
ISO 1302:1992	<i>Technical drawings - Method of indicating surface texture.</i>
ISO/IEC 11576:1994	<i>Information technology - Procedure for the registration of algorithms for the lossless compression of data.</i>