

INTERNATIONAL STANDARD

ISO/IEC
20062

First edition
2001-12-15

Information technology — 8 mm wide magnetic tape cartridge for information interchange — Helical scan recording — VXA-1 format

*Technologies de l'information — Cartouche de bande magnétique de 8 mm
de large pour échange d'informations — Enregistrement par balayage en
spirale — Format VXA-1*

Reference number
ISO/IEC 20062:2001(E)



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 2001

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 22 749 09 47
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 drive	1
2.3 Receiving drive	1
3 Normative references	1
4 Terms and definitions	2
4.1 ac erase	2
4.2 algorithm	2
4.3 Average Signal Amplitude	2
4.4 azimuth	2
4.5 back surface	2
4.6 Beginning of Data (BOD)	2
4.7 Beginning of Tape (BOT)	2
4.8 bit cell	2
4.9 byte	2
4.10 cartridge	2
4.11 Channel bit	2
4.12 Cyclic Redundancy Check (CRC) character	2
4.13 End of Data (EOD)	2
4.14 End of Partition (EOP)	2
4.15 End of Tape (EOT)	2
4.16 Error Correcting Code (ECC)	2
4.17 File Mark	2
4.18 Logical Block	2
4.19 magnetic tape	2
4.20 Master Standard Reference Tape	2
4.21 Partition	2
4.22 physical recording density	2
4.23 Reference Field	2
4.24 Secondary Standard Reference Tape (SSRT)	2
4.25 Set Mark	2
4.26 Standard Reference Amplitude (SRA)	3
4.27 Standard Reference Current (Ir)	3
4.28 Tape Reference Edge	3
4.29 Test Recording Current (TRC)	3
4.30 Track	3
4.31 Typical Field	3
5 Conventions and Notations	3
5.1 Representation of numbers	3
5.2 Names	3
6 Acronyms	3

7	Environment and Safety	4
7.1	Testing environment	4
7.2	Operating environment	4
7.3	Storage environment	4
7.4	Transportation	4
7.5	Safety	4
7.6	Flammability	4
Section 2 - Requirements for the case		4
8	Dimensional and mechanical characteristics of the case	4
8.1	General	4
8.2	Overall dimension	5
8.3	Holding areas	5
8.4	Cartridge insertion	6
8.5	Window	7
8.6	Loading grips	7
8.7	Label areas	7
8.8	Datum areas and datum holes	7
8.9	Support areas	8
8.10	Recognition holes	9
8.11	Write-inhibit hole	10
8.12	Pre-positioning surfaces	10
8.13	Lid	10
8.14	Cartridge reel lock	11
8.15	Reel access holes	12
8.16	Interface between the reels and the drive spindles	12
8.17	Light path	13
8.18	Position of the tape in the case	14
8.19	Tape path zone	14
8.20	Tape access cavity	15
8.21	Tape access cavity clearance requirements	15
Section 3 - Requirements for the Unrecorded Tape		32
9	Mechanical, physical and dimensional characteristics of the tape	32
9.1	Materials	32
9.2	Length	32
9.2.1	Length of the magnetic tape	32
9.2.2	Length of leader and trailer tapes	32
9.2.3	Length of the splicing tape	32
9.3	Width	32
9.3.1	Width of magnetic, leader and trailer tape	32
9.3.2	Width and position of the splicing tape	33
9.3.3	Edge weave	33
9.4	Discontinuities	34
9.5	Thickness	34
9.5.1	Thickness of the magnetic tape	34
9.5.2	Thickness of leader and trailer tape	34
9.5.3	Thickness of the splice tape	34
9.6	Longitudinal curvature	34
9.7	Cupping	34
9.8	Coating adhesion	34
9.9	Layer-to-layer adhesion	35
9.10	Tensile strength	35
9.10.1	Breaking strength	35
9.10.2	Yield strength	35
9.11	Residual elongation	36
9.12	Electrical resistance of the recording surface	36

9.13	Tape winding	36
9.14	Light transmittance of tape	36
10	Magnetic recording characteristics	36
10.1	Test conditions	37
10.2	Typical Recording Current	37
10.3	Signal Amplitude	37
10.4	Resolution	37
10.5	Signal-to-Noise Ratio	37
10.6	Ease of erasure	38
10.7	Tape quality	38
10.7.1	Missing pulses	38
10.7.2	Missing pulse zone	38
10.7.3	Overwrite	38
Section 4	Requirements for an Interchanged Tape	38
11	Track Format	38
11.1	General	38
11.2	Physical Logical Block Format	39
11.2.1	Logical Block Set (LBS)	39
11.2.2	Logical Blocks	40
11.2.3	Segment Packets	40
11.2.4	Segment Overhead Packets	40
11.2.5	Skipped Segment Packets	44
11.2.6	Segment ECC packets	44
11.2.7	Segment flush	45
11.3	Track Packet format	45
11.3.1	Virtual Packet Address	45
11.3.2	Local Packet Address	45
11.3.3	Packet data	47
11.3.4	Packet CRC	48
11.3.5	Packet Reed-Solomon ECC	48
11.4	Control packet format	48
11.5	Packet framing sync	51
12	Tape Format	51
12.1	Track elements	52
12.2	Data track format	52
12.2.1	Order of packets in a data track	52
12.2.2	Rewrite	52
12.3	Gap tracks	53
13	Method of recording	54
13.1	Physical recording density	54
13.1.1	Long-term average bit cell length	54
13.1.2	Short-term average bit cell length	54
13.1.3	Rate of change	54
13.2	Bit shift	54
13.3	Amplitude of Data Signals	54
14	Track geometry	54
14.1	General	54
14.2	Track pitch	55
14.3	Average track pitch	55
14.4	Track width	55
14.5	Track angle	55
14.6	Track length	55
14.7	Guard band	55

14.8	Azimuth angles	56
14.9	Track linearity	56
15	Layout of a tape	56
15.1	General	56
15.2	Beginning of Partition	56
15.3	Tape Header Record (THR)	56
15.4	Data area	57
15.5	Tape Directory Record	57
15.6	End of Data	58
15.7	End of Partition (EOP)	58

Annexes

A	Measurement of Light Transmittance of Tape and Leaders	59
B	The Packet ECC	62
C	The Segment ECC	63
D	Generation of the Segment Overhead CRCs	64
E	Generation of the Segment Data CRC	65
F	Generation of the Packet CRC	66
G	Representation of 8-bit bytes by 14-bit patterns	67
H	Measurement of bit shift	75
J	Tape Count	77
K	Recommendations for transportation	78

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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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

The main task of the joint technical committee is to prepare International Standards. 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.

ISO/IEC 20062 was prepared by ECMA (as Standard ECMA-316) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval of national bodies of ISO and IEC.

Annexes A to J form a normative part of this International Standard. Annex K is for information only.

Information technology - 8 mm wide magnetic tape cartridge for information interchange - Helical scan recording - VXA-1 format

Section 1 - General

1 Scope

This International Standard specifies the physical and magnetic characteristics of an 8 mm wide magnetic tape cartridge to enable physical interchange of such cartridges between drives. It also specifies the quality of the recorded signals, the recording method and the recorded format called VXA-1, and thereby allowing data interchange between drives by means of such magnetic tape cartridges.

This International Standard specifies three types depending on the length of magnetic tape contained in the case, referred to as Type A, Type B and Type C.

Information interchange between systems also requires, at a minimum, agreement between the interchange parties upon the interchange code(s) and the specifications of the structure and labelling of the information on the interchanged cartridge.

If compression is used with this format, it shall be according to International Standard ISO/IEC 15200.

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 throughout the extent of the tape.

2.2 Generating drive

A drive 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 meet the mandatory requirements of this International Standard. A claim of conformance shall state whether or not the registered compression algorithm specified in ISO/IEC 15200 is implemented within the system to process data from the host prior to allocating data to segment data packets.

2.3 Receiving drive

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 on this tape according to this International Standard. A receiving drive shall be able to recognise the use of the data compression algorithm specified in ISO/IEC 15200.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 15200:1996	<i>Information technology - Adaptive Lossless Data Compression algorithm (ALDC)</i>
ISO 527-3:1995	<i>Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets</i>
ISO 1302:— ¹⁾	<i>Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation</i>
ISO/IEC 11576:1994	<i>Information technology - Procedure for the registration of algorithms for the lossless compression of data</i>
IEC 60950-1:2001	<i>Information technology equipment - Safety - Part 1: General requirements</i>

¹⁾ To be published. (Revision of ISO 1302:1992)