INTERNATIONAL STANDARD

ISO 10755

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Graphic technology — Prepress digital data exchange — Colour picture data on magnetic tape

Technologie graphique — Échange de données digitales de préimpression — Données d'images en couleur sur bande magnétique

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Contents

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10755 was prepared by the American National Standards Institute (as ANSI IT8.1-1988) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 130, *Graphic technology*, in parallel with its approval by the ISO member bodies.

Annex A of this International Standard is for information only.

Introduction

The technical content of this International Standard is identical to that of American National Standard IT8.1-1988. The ANSI document was circulated for ISO approval as a fast-track document at the request of the 1989 plenary meeting of ISO/TC 130 and subsequent to its approval was restructured to be in accordance with part 3 of the *IEC/ISO Directives*. The IT8 document itself resulted from the joint efforts of an international industry group that included participants representing all of the major prepress vendors in the world. That group, initially identified as the DDES (Digital Data Exchange Standards) Committee, later became the founders of the ANSI IT8 (Image Technology) accredited standards committee which is responsible for electronic data exchange standards in graphic arts prepress.

Graphic technology — Prepress digital data exchange — Colour picture data on magnetic tape

1 Scope

This International Standard specifies a format for magnetic tape that will enable colour picture data transfer between colour electronic prepress systems manufactured by different vendors.

2 Conformance

A DDES implementation shall be in conformance with this International Standard if it meets the requirements of clauses 6 to 8 excepting those requirements specifically identified as non-UEF and EUEF. Non-UEF and EUEF, if used, shall be written as specified but are optionally read.

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/IEC 646:1991, *Information technology — ISO 7-bit coded character set for information interchange.*

ISO 1001:1986, *Information processing — File structure and labelling of magnetic tapes for information interchange.*

ISO 1864:1985, *Information processing — Unrecorded 12,7 mm (0,5 in) wide magnetic tape for information interchange — 32 ftpmm (800 ftpi) NRZ1, 126 ftpmm (3 200 ftpi) phase encoded and 356 ftpmm (9 042 ftpi) NRZ1.*

ISO/IEC 3788:1990, *Information processing — 9-track, 12,7 mm (0,5 in) wide magnetic tape for information interchange using phase encoding at 126 ftpmm (3 200 ftpi), 63 cpmm (1 600 cpi).*

ISO 5652:1984, *Information processing — 9-Track, 12,7 mm (0.5 in) wide magnetic tape for information interchange — Format and recording, using group coding at 246 cpmm (6 250 cpi).*

4 Definitions

For the purposes of this International Standard, the following definitions apply.

4.1 Digital Data Exchange Specification (DDES): A method of sharing digitally encoded information between cooperating systems.

4.2 User Exchange Format (UEF): The basic features that a system should implement to be in accordance with this International Standard.

4.3 Extended User Exchange Format (EUEF): Optional features that a system may implement in addition to the UEF features.

4.4 non-UEF: Vendor specific features not defined in this International Standard.

4.5 decimal point notation: The expression of a decimal number in a numeric field as a string of numeric characters (ISO/IEC 646 positions 3/0 to 3/9), with optional decimal point (ISO/IEC 646 position 2/14 - full stop).

5 Symbols and abbreviations

The following symbols and abbreviations are used in this International Standard:

BP:	Byte position within a label. For ease of use with ISO 1001, byte positions start at 1.
L:	Length of field in number of byte positions.

SPACE or b: The character coded in position 2/0 of ISO/IEC 646.

ZERO: The character coded in position 3/0 of ISO/IEC 646.

6 Requirements

6.1 Basic requirement

UEF version 00 is the basic requirement for the exchange of colour pictures. The picture data to be exchanged under UEF version 00 consist of a rectangular array of picture elements ("pixels"). A pixel is represented by a set of values corresponding to its colour components. UEF version 00 pixels consist of four eight-bit bytes, representing cyan ("C"), magenta ("M"), yellow ("Y"), and black ("K") process colours.

6.2 DDES00 tapes

When the tape is identified as DDES (BP 44-47) version 00 (BP 50-51) in the Volume 1 Header, then the tape shall be written as specified in this International Standard. No other values are permitted in UEF or EUEF fields. The only fields available for non-prescribed use are the fields with contents "reserved for system use (vendor use)" and vendor UHLs (BP 04-80). All other fields shall be written either as described in this International Standard or as in ISO 1001.

Where fields are not defined in this International Standard, ISO 1001 shall be used.

DDES tapes shall be written at 1 600 bpi phase encoded or 6 250 bpi GCR, in accordance with ISO/IEC 3788 or ISO 5652 respectively, on media as specified in ISO 1864.

6.3 EUEF formats

Use of the extended implementation EUEF fields and values is optional. However, only those codes specified in this International Standard shall be used.

6.4 Non-UEF

Non-UEF fields and values shall also be specified within DDES. These fields and values shall be restricted in use in the same manner as EUEF fields and values.

6.5 Specifying UEF, EUEF, and non-UEF formats

BP 05-10 of UHL1 shall be used as the UEF indicator. These fields shall be coded as indicated in 7.2.4.

6.6 Padding of fields

Any numeric fields shall be right-justified and ZERO padded and any alphanumeric fields shall be left-justified and padded with SPACEs.

6.7 Utilization of User Header Labels

UHL1, UHL2 and UHL3 are currently specified in this International Standard. Up to 26 additional UHLs are reserved for use in UHL2: up to eight for future DDES use (BP 31), up to nine for other future use (BP 32), and up to nine for vendor use (BP 33). DDES UHL values (BP 04) will be unique and in order. The values "1" to "9", "A", and "B" are reserved for DDES use.

6.8 Intermixing tape formats

Different UEF magnetic tape file formats may be found on the same DDES tape and/or volume set. A DDES magnetic tape may also contain EUEF as well as non-UEF file formats.

7 Header Labels for DDES00

The following subclauses describe the DDES use of ISO 1001 tape format.

7.1 General tape format

Table 1 gives the format for two picture files on one tape. Table 2 gives the format for two picture files on two tapes. This International Standard supports multiple tapes in a file set as described in HDR1, including the splitting of a picture file over multiple tapes (an example is shown in annex A).

7.2 Header Labels

The following subclauses specify the Header Labels for DDES00 UEF00 tapes. There shall be no optional formats or fields in DDES00 except as specified.

Table 1 — Format for two picture files on one tape

BOT VOL1	Physical tape mark (beginning of tape) Volume Header Label
HDR1 HDR2 UHL1 UHL2 UHL3 * * * TM **** TM EOF1 EOF2 UTL1 UTL2 UTL3 * * * TM	File Header Label 1 of the following file File Header Label 2 of the following file User Header Label 1 of the following file User Header Label 2 of the following file User Header Label 3 of the following file Additional UHLs may be specified in UHL2 (BP 31-33) Logical tape mark picture data PICTURE FILE 1 Logical tape mark End of File Label 1 End of File Label 2 User Trailer Label 1 User Trailer Label 2 User Trailer Label 3 A UTL for each UHL is to be included on the tape. These are not required to be read. UTLs follow EOV2 and EOF2. These are copied from the preced- ing UHLs (see 8.1) Logical tape mark
HDR1 HDR2 UHL1 UHL2 UHL3 * * * TM **** TM EOF1 EOF2 UTL1 UTL2 UTL3 * * * TM	File Header Label 1 of the following file File Header Label 2 of the following file User Header Label 1 of the following file User Header Label 2 of the following file User Header Label 3 of the following file Logical tape mark picture data PICTURE FILE 2 Logical tape mark End of File Label 1 End of File Label 2 User Trailer Label 1 User Trailer Label 2 User Trailer Label 3 Logical tape mark
TM EOT	Logical tape mark (logical end of tape) Physical tape mark (end of tape)

Table 2 — Format for two picture files on two tapes

	First Tape
BOT VOL1	Physical tape mark (beginning of tape) Volume Header Label
HDR1 HDR2 UHL1 UHL2 UHL3 * * * TM **** TM EOF1 EOF2 UTL1 UTL2 UTL3 * * * TM	File Header Label 1 of the following file File Header Label 2 of the following file User Header Label 1 of the following file User Header Label 2 of the following file User Header Label 3 of the following file Logical tape mark picture data PICTURE FILE 1 Logical tape mark End of File Label 1 End of File Label 2 User Trailer Label 1 User Trailer Label 2 User Trailer Label 3 Logical tape mark
HDR1 HDR2 UHL1 UHL2 UHL3 * * * TM **** EOT TM EOV1 EOV2 UTL1 UTL2 UTL3 * * * TM	File Header Label 1 of the following file section File Header Label 2 of the following file section User Header Label 1 of the following file section User Header Label 2 of the following file section User Header Label 3 of the following file section Logical tape mark picture data PICTURE FILE 2 - Section 1 Physical tape mark (end of tape) Logical tape mark End of Volume Label 1 End of Volume Label 2 User Trailer Label 1 User Trailer Label 2 User Trailer Label 3 Logical tape mark
TM	Logical tape mark (logical end of tape)

Table 2 *(concluded)*

	Second Tape	
BOT	Physical tape mark (beginning of tape)	
VOL1	Volume Header Label	
HDR1	File Header Label 1 of the following file section	
HDR2	File Header Label 2 of the following file section	
UHL1	User Header Label 1 of the preceding file section	
UHL2	User Header Label 2 of the preceding file section	
UHL3	User Header Label 3 of the preceding file section	
*		
*		
*		
TM	Logical tape mark	
****	picture data	PICTURE FILE 2 - Section 2
TM	Logical tape mark	
EOF1	End of File Label 1	
EOF2	End of File Label 2	
UTL1	User Trailer Label 1	
UTL2	User Trailer Label 2	
UTL3	User Trailer Label 3	
*		
*		
*		
TM	Logical tape mark	
TM	Logical tape mark (logical end of tape)	
EOT	Physical tape mark (end of tape)	

7.2.1 Volume 1 Header (VOL1)

Table 3 gives byte position, field name, length in bytes, and content for Volume 1 Header.

The sequence number of tapes in a volume set shall start with "01" and be incremented by 1 for each tape in the set as specified in BP 48-49.

Table 3 — Volume 1 Header (VOL1)

BP	Field name	*L*	Content
01-04	label identifier and number	4	"VOL1"
05-10	volume identifier	6	
11	volume accessibility	1	SPACE
12-37	reserved for ISO 1001 use	26	SPACEs
38-43	creation date (ISO 1001 format)	6	
44-47	DDES identifier	4	"DDES"
48-49	sequence number of tape in volume set	2	
50-51	DDES version	2	"00"
52-79	reserved for ISO 1001 use	28	SPACEs
80	label standard version	1	

7.2.2 File Header Label 1 (HDR1)

Table 4 gives byte position, field name, length in bytes, and content for File Header Label 1.

The contents of file identifier (BP 05-21), generation number (BP 36-39) and generation version number (BP 40-41) can be different between different operating systems. These fields are not intended for use in intervendor systems communication.

The file set identifier field (BP 22-27) does not contain a job name for DDES. The job name shall be contained in the User Header Label 1 (see table 6).

When the date is not defined, SPACE followed by five ZEROs or, alternatively, six ZEROs shall be used (see BP 48-53 in table 4).

Table 4 — File Header Label 1 (HDR1)

BP	Field name	*L*	Content
01-04	label identifier and number	4	"HDR1"
05-21	file identifier	17	
22-27	file set identifier	6	
28-31	file section number	4	
32-35	file sequence number	4	
36-39	generation number	4	
40-41	generation version number	2	
42-47	file creation date	6	
48-53	file expiration date (optional)	6	
54	file accessibility	1	SPACE
55-60	block count	6	ZEROs
61-73	reserved for system use (vendor use)	13	
74-80	reserved for ISO 1001 use	7	SPACEs

7.2.3 File Header Label 2 (HDR2)

Table 5 gives byte position, field name, length in bytes, and content for File Header Label 2.

BP 16-50 (system use/vendor use) shall be for individual use of the vendors and not for intervendor systems communication.

Table 5 — File Header Label 2 (HDR2)

BP	Field name	*L*	Content
01-04	label identifier and number	4	"HDR2"
05	record format = fixed length	1	"F"
06-10	block length (fixed for UEF)	5	"08192"
11-15	record length (fixed for UEF)	5	"08192"
16-50	reserved for system use (vendor use)	35	
51-52	buffer offset length	2	ZEROs
53-80	reserved for ISO 1001 use	28	SPACEs

7.2.4 User Header Label 1 (UHL1)

Table 6 gives byte position, field name, length in bytes, and content for User Header Label 1.

BP 05-10 shall be the UEF indicator as follows:

"UEFb00"	— User Exchange Format for colour pictures
"EUEF00"	— Extended UEF file
"bbbb00"	— non-UEF file

All other nomenclature shall be reserved for future DDES use.

BP 11-30 shall be reserved for the name of the equipment vendor sending the tape. A different vendor name should be used by each vendor.

Table 6 — User Header Label 1 (UHL1)

BP	Field name	*L*	Content
01-04	label identifier and number	4	"UHL1"
05-10	UEF indicator	6	"UEF␣00"
11-30	vendor name	20	
31-40	program name	10	
41-60	job name	20	
61-80	picture name	20	

7.2.5 User Header Label 2 (UHL2)

Table 7 gives byte position, field name, length in bytes, and content for User Header Label 2.

BP 25-28 specify the type of file on the tape, as follows:

Standard types:
"0000" — colour picture (UEF)
"0001" — line art (reserved for other DDES use)
"0002" — geometric art (reserved for other DDES use)
"0003" - "0099" — reserved for future DDES use
> "0099" — available for vendor use

BP 31, 32 and 33 specify the number of UHLs on the tape, which shall, in sequence, be all DDES UHLs, followed by all "other future use" UHLs, followed by all vendor UHLs, regardless of the label number of each one. There shall be no specific meaning or assumed sequence for the label number (BP 04) for numbers or letters in this field (except for the DDES UHLs as specified in 6.7).

BP 34-35 specify the number of blocks within a picture file before the first line of picture data. It permits the vendor to use this area for special purposes.

The current value of BP 36-80 shall be SPACEs.

Table 7 — User Header Label 2 (UHL2)

BP	Field name	*L*	Content
01-04	label identifier and number	4	"UHL2"
05-24	site name	20	
25-28	file type	4	"0000"
29-30	reserved for system use (vendor use)	2	
31	number of additional DDES UHLs currently = 1 (UHL3)	1	"1"
32	number of other future use UHLs	1	ZERO
33	number of vendor UHLs (at the vendor's discretion)	1	
34-35	offset (number of blocks) to start of data (at the vendor's discretion)	2	
36-80	reserved for future DDES use	45	SPACEs

7.2.6 User Header Label 3 (UHL3) (parameter block)

Table 8 gives byte position, field name, length in bytes, and content for User Header Label 3.

7.2.6.1 Format of data

There shall be two UEF formats for interleaving the picture data: pixel interleaving and line interleaving. Colour interleaving is a non-UEF format. These formats shall be specified in BP 05-06 of UHL3 as:

"00" — pixel interleaving (UEF)
"01" — line interleaving (UEF)
"02" — colour interleaving (reserved for other DDES use)

UEF requires that pixel or line interleaving shall be written and that both pixel and line interleaving shall be read.

7.2.6.1.1 Pixel interleaving (UEF)

A row of alternating colour pixels (sets of four colours in YMCK or CMYK order) forms a line of the picture, and a sequence of these lines forms the breadth of the picture.

For pixel interleaving, UEF requires that the YMCK or the CMYK order of pixels shall be written and that both the YMCK and CMYK order shall be read.

For EUEF and non-UEF, if the number of colour separations and the number of pixels per line are both odd, there shall be one redundant byte at the end of each line.

7.2.6.1.2 Line interleaving (UEF)

One line of a colour shall be followed by that line of the next colour (*n* lines of *n* colour separations). UEF requires that the colour order shall be CMYK for line interleaving. If the number of pixels per line is odd, there shall be one redundant byte at the end of each line.

7.2.6.1.3 Colour interleaving (optional)

All lines of one colour shall be followed by all lines of the next colour (*n* images of *n* colour separations). If the number of pixels per line is odd, there shall be one redundant byte at the end of each line.