AS ISO/IEC 12087.3:2015
ISO/IEC 12087-3:1995
ISO/IEC 12087-3:1995/Amd 1:1996

AS ISO/IEC 12087.3:2015

Australian STANDARD

Information technology—Computer graphics and image processing—Image Processing and Interchange (IPI)—Functional specification

Part 3: Image Interchange Facility (IIF)

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This Australian Standard® was prepared by Committee IT-031, Computer Modelling and Simulation. It was approved on behalf of the Council of Standards Australia on 20 April 2015. This Standard was published on 12 May 2015.

The following are represented on Committee IT-031:

- ANZLIC—The Spatial Information Council
- Department of Defence (Australia)
- Simulation Australia

This Standard was issued in draft form for comment as DR AS ISO/IEC 12087.3:2015.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

Information technology—Computer graphics and image processing—Image Processing and Interchange (IPI)—Functional specification

Part 3: Image Interchange Facility (IIF)

First published as AS ISO/IEC 12087.3:2015.

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Published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 978 1 76035 046 8

PREFACE

This Standard was prepared by the Standards Australia Committee IT-031, Computer Modelling and Simulation.

The objective of this Standard is to provide a data format specification known as the Image Interchange Facility (IIF) and an application program interface specification. This IIF data format may be used for image data interchange in open, heterogeneous environments. It may also serve as a local file format for imaging applications, especially in conjunction with AS ISO/IEC 12087-2.

This Standard is identical with, and has been reproduced from ISO/IEC 12087-3:1995, *Information technology—Computer graphics and image processing—Image Processing and Interchange (IPI)—Functional specification*, Part 3: *Image Interchange Facility (IIF)* and its Amendment 1 (1996) which has been added at the end of the source text.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text ‘this part of ISO/IEC 12087’ should read ‘this Australian Standard’.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
ISO/IEC		AS ISO/IEC	
12087	Information technology—Computer graphics and image processing—Image Processing and Interchange (IPI)—Functional specification	12087	Information technology—Computer graphics and image processing—Image Processing and Interchange (IPI)—Functional specification
12087-1	Part 1: Common architecture for imaging	12087.1	Part 1: Common architecture for imaging
12089	Information technology—Computer graphics and image processing—Encoding for the Image Interchange Facility (IIF)	12089	Information technology—Computer graphics and image processing—Encoding for the Image Interchange Facility (IIF)

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annexes to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

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INTRODUCTION

ISO/IEC 12087-1 establishes the conceptual and architectural framework for ISO/IEC 12087. In particular, it defines the types of all image data objects, image-related data objects, and attributes that may be interchanged by means of the IPI-IIF.

ISO/IEC 12087-2 establishes the specification of the Programmer's Imaging Kernel System (IPI-PIKS).

ISO/IEC 12087-3 provides a data format specification and an application program interface specification. The IIF data format may be used for image data interchange in open, heterogeneous environments. It may also serve as a local file format for imaging applications, especially in conjunction with ISO/IEC 12087-2. In future, the IIF data format could be used by telecommunication standards. Examples are future versions of File Transfer, Access, and Management (FTAM), ISO/IEC 8571; the Message Oriented Text Interchange Systems (MOTIS), ISO/IEC 10021 (also known as Message Handling System (MHS), CCITT Recommendation X.400). Thus the IIF data format could become part of application-oriented OSI communications protocols.

Within the IIF data format (IIF-DF), compressed images may be specified and interchanged. For this purpose, the following standards are referenced:

- CCITT Recs. T.4 and T.6 (Facsimile)
- ISO/IEC 11544 (JBIG)
- ISO/IEC 10918 (JPEG)
- ISO/IEC 11172 (MPEG-1)

Image data streams that conform to the encoded representation of compressed image data specified by these standards may be included in the IIF-DF. For instance, a time series image can be represented as an array of time slices, each of which is encoded according to the JPEG Standard. Furthermore, the IIF-DF allows images to be represented through the combination of compressed parts with uncompressed parts. It is also possible to use multiple compression methods within a single IIF-DF-conformant image. For instance, a colour image can be represented as tiled images whereby some tiles are encoded according to the lossy mode of the JPEG Standard and others according to the lossless mode. For detailed information concerning compressed data streams and compression/decompression functionality, refer to 5.3.3 and 7.1.6, respectively.

There are various possibilities for interaction and data exchange between the IPI-PIKS domain and the IPI-IIF domain. Both domains are controlled by the application via application program interfaces (APIs). For a detailed description of the interworking between the IPI-PIKS and the IPI-IIF refer to clause 4 (the IPI-IIF architecture) and clause 7 (the IPI-IIF Gateway functionality). For a description of the relation between the types of objects that may be interchanged by means of the IPI-IIF and those types of objects that may be processed by the IPI-PIKS, refer to clause 6 (the profiles for the IIF data format). Refer also to ISO/IEC 12087-1.

AUSTRALIAN STANDARD

Information technology—Computer graphics and image processing—Image Processing and Interchange (IPI)—Functional specification

Part 3:
Image Interchange Facility (IIF)

1 Scope

This part of ISO/IEC 12087 facilitates the interchange of digital images. For this purpose, conceptual, architectural, and functional definitions of the Image Interchange Facility (IPI-IIF) are established. ISO/IEC 12087-3 consists of two major parts, the:

a) IIF data format (IIF-DF) definition (by means of a formal syntax, described according to the Abstract Syntax Notation One (ASN.1) -- refer to clause 5), and the

b) IIF Gateway definition (by means of a manual page description of the functionality of an Application Program Interface (API) -- refer to clause 7).

An IPI-IIF-conformant implementation has to fulfill the functionality specification of the IIF Gateway, as outlined in clause 7. Besides the IIF Gateway, there may be information processing systems (software such as parsers, generators, etc.) which read and/or write the IIF-DF.

The IPI-IIF is based on the definitions described in ISO/IEC 12087-1, the "Common Architecture for Imaging". The IPI-IIF, as a whole, may be characterized briefly as follows:

c) By means of the IIF data format and Gateway, image data objects and image-related data objects are transported to and from application environments.

d) By means of the full PIKS profile of the IPI-IIF data format (i.e., a format for data interchange between IPI-IIF and IPI-PIKS), image data objects and image-related data objects are imported to and exported from the Programmer's Imaging Kernel System (IPI-PIKS), defined in ISO/IEC 12087-2.

e) The IPI-IIF facilitates the storage of image data objects and image-related data objects in a variety of pre-defined storage modalities, including different periodicity organizations, such as pixel-interleaving or band-interleaving.

f) This part of ISO/IEC 12087 defines syntax of image data (and image-related data) streams. The encoding of IIF data types is defined in ISO/IEC 12089. See also 5.3.3.

g) The IPI-IIF supports a concept of standardized conformance profiles. Initially, three conformance profiles are defined within ISO/IEC 12087.

h) An IIF data stream may be stored in devices such as file systems. An IIF data stream may be interchanged and communicated in data networks (e.g., LANs and WANs) or in other data communication facilities. All low-level data storage and transfer is delegated, for instance, to the operating system of the target hardware.

i) The IIF Gateway performs compression and decompression of image data objects using standardized compression and decompression techniques. These techniques are referenced in this part of ISO/IEC 12087. See 1.4.5 and 5.3.3 and 7.5 for further definition.

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