



**International
Standard**

ISO/IEC 23090-13

**Information technology — Coded
representation of immersive
media —**

**Part 13:
Video decoding interface for
immersive media**

*Technologies de l'information — Représentation codée de média
immersifs —*

Partie 13: Interface de décodage vidéo pour les média immersifs

**First edition
2024-01**



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2024

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
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	2
5 Video decoding engine	2
5.1 General.....	2
5.2 Input video decoding interface.....	4
5.3 Output video decoding interface.....	4
5.4 Control interface to the Video Decoding Interface.....	5
5.4.1 Functions.....	5
5.5 Examples of video decoding engine instantiations.....	9
5.5.1 Mapping on OpenMAX™ integration layer (OpenMAX IL).....	9
5.5.2 Mapping on Vulkan® Video.....	9
5.5.3 Informative mapping.....	12
6 VDI systems decoder model	13
6.1 Introduction.....	13
6.2 Concepts of the VDI systems decoder model.....	13
6.2.1 General.....	13
6.2.2 Media stream.....	13
6.2.3 Media stream interface.....	13
6.2.4 Input formatter.....	13
6.2.5 Access Units (AU).....	14
6.2.6 Decoding Buffer (DB).....	14
6.2.7 Elementary Streams (ES).....	14
6.2.8 Elementary Stream Interface (ESI).....	14
6.2.9 Decoder.....	14
6.2.10 Composition Units (CU).....	14
6.2.11 Composition Memory (CM).....	14
6.2.12 Compositor.....	14
7 Video decoder interface	14
7.1 General.....	14
7.2 Operations on input media streams.....	14
7.2.1 General.....	14
7.2.2 Concepts.....	15
7.2.3 Filtering by video object identifier.....	15
7.2.4 Inserting video objects.....	16
7.2.5 Appending two video objects.....	17
7.2.6 Stacking two video objects.....	18
7.3 Slice-based instantiation for ISO/IEC 23008-2 high efficiency video coding (HEVC).....	19
7.3.1 General.....	19
7.3.2 Media and elementary stream constraints.....	19
7.4 Layer-based instantiation for ISO/IEC 23090-3 versatile video coding (VVC).....	20
7.4.1 General.....	20
7.4.2 Media and elementary stream constraints.....	20
7.5 Slice-based instantiation for ISO/IEC 23094-1 essential video coding (EVC).....	22
7.5.1 General.....	22
7.5.2 Media and elementary streams constraints.....	23
Annex A (normative) Control interface IDL definition	25
Annex B (informative) OpenMAX IL VDI extension header	26

ISO/IEC 23090-13:2024(en)

Annex C (normative) Supplemental enhancement information (SEI) syntax and semantics	27
Annex D (informative) Example implementations of input formatting operations	33
Annex E (informative) Brief description of OpenMAX IL functions	38
Annex F (informative) Mapping on media source extensions (MSE)	41
Bibliography	43

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 or www.iec.ch/members_experts/refdocs).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents and <https://patents.iec.ch>. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

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. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO 23090 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 and www.iec.ch/national-committees.

Introduction

The interfaces and operations specified in this document come as extensions of existing video decoding engine specifications exposing hardware video decoding capabilities.

Information technology — Coded representation of immersive media —

Part 13: Video decoding interface for immersive media

1 Scope

This document specifies the interfaces of a video decoding engine as well as the operations related to elementary streams and metadata that can be performed by this video decoding engine. To support those operations, this document also specifies SEI messages when necessary for certain video codecs.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 23008-2, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 2: High efficiency video coding*

ISO/IEC 23090-3, *Information technology — Coded representation of immersive media — Part 3: Versatile video coding*

ISO/IEC 23094-1, *Information technology — General video coding — Part 1: Essential video coding*