

# SMPTE STANDARD

## Dynamic Metadata for Color Volume Transform — Application #4



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## Foreword

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SMPTE Engineering Documents are drafted in accordance with the rules given in its Standards Operations Manual.

SMPTE ST 2094-40 was prepared by Technology Committee 10E.

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SMPTE draws attention to the fact that it is claimed that compliance with this Standard may involve the use of one or more patents or other intellectual property rights (collectively, "IPR"). The Society takes no position concerning the evidence, validity, or scope of this IPR.

Each holder of claimed IPR has assured the Society that it is willing to License all IPR it owns, and any third party IPR it has the right to sublicense, that is essential to the implementation of this Standard to those (Members and non-Members alike) desiring to implement this Standard under reasonable terms and conditions, demonstrably free of discrimination. Each holder of claimed IPR has filed a statement to such effect with SMPTE. Information may be obtained from the Director, Standards & Engineering at SMPTE Headquarters.

Attention is also drawn to the possibility that elements of this Standard may be subject to IPR other than those identified above. The Society shall not be responsible for identifying any or all such IPR.

## Introduction

This section is entirely informative and does not form an integral part of this Engineering Document.

Dynamic Metadata for Color Volume Transform Application #4 defines scene-based metadata designed to help to reproduce the original intent of the creator of High Dynamic Range (HDR) and Wider Color Gamut (WCG) image essence on a display having a smaller color volume, even in the case that the mastering display and the targeted system display can both have practical limits on the peak luminance they can produce, these limits being imposed to meet display power restrictions and other constraints.

## 1 Scope

This standard specifies the metadata for Color Volume Transform Application #4, Scene-based Color Volume Mapping. It is a specialization of the content-dependent transform metadata entries and processing blocks of the generalized color volume transform model defined in the SMPTE ST 2094-1 Core Components standard.

Scene-based Color Volume Mapping consists of scene-based tone mapping and scene-based color saturation mapping processing blocks. These processing blocks make use of the peak luminance behaviors of the display used for mastering the image essence (i.e. the “mastering display”) and the targeted system display as their ability to achieve peak luminance varies with the average brightness level of the pixels and the number of bright pixels within the scene. In addition to these adjustments that can be algorithmically determined from known display and content characteristics, Scene-based Color Volume Mapping also allows creatively approved adjustments.

## 2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword “reserved” indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword “forbidden” indicates “reserved” and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; then formal languages; then figures; and then any other language forms.

## 3 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this engineering document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this engineering document are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.