

First edition
2009-12-15

AMENDMENT 5
2015-11-01

**Information technology — Coding of
audio-visual objects —**

**Part 27:
3D Graphics conformance**

**AMENDMENT 5: Multi-resolution 3D
mesh compression**

*Technologies de l'information — Codage des objets audiovisuels —
Partie 27: Conformité aux graphiques 3D*

AMENDEMENT 5: Compression de maille en 3D à résolution multiple

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

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Amendment 5 to ISO/IEC 14496-27:2009 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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Information technology — Coding of audio-visual objects — Part 27: 3D Graphics conformance, AMENDMENT 5: Multi- resolution 3D mesh compression

In 6.3.2 Test bitstreams, replace:

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
Axe	File with simple static mesh	3DMCe	axe	Axe	axe
Cottage	File with one big mesh	3DMCe	cottage	Cottage	cottage
Xplaneh	File with more static meshes and color	3DMCe	xplaneh	xplaneh	xplaneh
basketball	File with static mesh and texture	3DMCe	basketball	basketball	basketball
Box	File with static mesh with texture	3DMCe	box	Box	box
Rabbit	File with bone-based animation and texture	3DMCe, BBA	N/A	Rabbit	rabbit
Eagle	File with bone-based animation and texture	3DMCe, BBA	N/A	eagle	eagle
Hero	File with more meshes and animation	3DMCe, BBA	Hero	hero	hero
PI_troll	File with PositionInterpolator animation and textures	3DMCe, PI	PI_Troll	PI_Troll	PI_Troll
OI_rabbit	File with OrientationInterpolator animation and textures	3DMCe, OI	OI_rabbit	OI_rabbit	OI_rabbit
CI_box	File with CoordinateInterpolator animation	3DMCe, CI	CI_box	CI_box	CI_box
eagle-fb	File with frame-based animation	3DMCe, FAMC	eagle-fb	eagle-fb	eagle-fb
shark-fb	File with frame-based animation	3DMCe, FAMC	shark-fb	shark-fb	shark-fb
wolf-fb	File with frame-based animation	3DMCe, FAMC	wolf-fb	wolf-fb	wolf-fb
dragon-fb	File with frame-based animation	3DMCe, FAMC	dragon-fb	dragon-fb	dragon-fb
tablecloth-fb	File with frame-based animation	3DMCe, FAMC	tablecloth-fb	tablecloth-fb	tablecloth-fb
AXE_Q_CD_EG	QBCR, circular prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_Q_CD_AC	QBCR, circular prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_Q_CD_BP	QBCR, circular prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_CD_4C	QBCR, circular prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Ad_EG	QBCR, adaptive prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	axe
AXE_Q_Ad_AC	QBCR, adaptive prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Ad_BP	QBCR, adaptive prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Ad_4C	QBCR, adaptive prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Xo_EG	QBCR, XOR prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Xo_AC	QBCR, XOR prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_Q_Xo_BP	QBCR, XOR prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Xo_4C	QBCR, XOR prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Di_EG	QBCR, differential prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Di_BP	QBCR, differential prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	axe
AXE_Q_Di_4C	QBCR, differential prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_CD_EG	SVA, circular prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_CD_AC	SVA, circular prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_S_CD_BP	SVA, circular prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_S_CD_4C	SVA, circular prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	axe
AXE_S_Ad_EG	SVA, adaptive prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Ad_AC	SVA, adaptive prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_S_Ad_BP	SVA, adaptive prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Ad_4C	SVA, adaptive prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Xo_EG	SVA, XOR prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	axe
AXE_S_Xo_AC	SVA, XOR prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_S_Xo_BP	SVA, XOR prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Xo_4C	SVA, XOR prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Di_EG	SVA, differential prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Di_AC	SVA, differential prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_S_Di_BP	SVA, differential prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Di_4C	SVA, differential prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_CD_EG	TFAN, circular prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_CD_AC	TFAN, circular prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_CD_BP	TFAN, circular prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	axe
AXE_T_CD_4C	TFAN, circular prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_T_Ad_EG	TFAN, adaptive prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Ad_AC	TFAN, adaptive prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_Ad_BP	TFAN, adaptive prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Ad_4C	TFAN, adaptive prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	axe
AXE_T_Xo_EG	TFAN, XOR prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Xo_AC	TFAN, XOR prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_Xo_BP	TFAN, XOR prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Xo_4C	TFAN, XOR prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Di_BP	TFAN, differential prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Di_4C	TFAN, differential prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_EG	TFAN, TFAN-based parallelogram prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_AC	TFAN, TFAN-based parallelogram prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_T_Tf_BP	TFAN, TFAN-based parallelogram prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_4C	TFAN, TFAN-based parallelogram prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_EG_VO	TFAN with vertex ordering preservation, TFAN-based parallelogram prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_T_Tf_EG_VO_FO	TFAN with vertex and face ordering preservation, TFAN-based parallelogram prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe

with:

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
axe	File with simple static mesh	3DMCe	axe	Axe	axe
cottage	File with one big mesh	3DMCe	cottage	Cottage	cottage
xplaneh	File with more static meshes and color	3DMCe	xplaneh	xplaneh	xplaneh
basketball	File with static mesh and texture	3DMCe	basketball	basketball	basketball
box	File with static mesh with texture	3DMCe	box	Box	box
rabbit	File with bone-based animation and texture	3DMCe, BBA	N/A	Rabbit	rabbit
eagle	File with bone-based animation and texture	3DMCe, BBA	N/A	eagle	eagle
hero	File with more meshes and animation	3DMCe, BBA	Hero	hero	hero
PI_troll	File with PositionInterpolator animation and textures	3DMCe, PI	PI_Troll	PI_Troll	PI_Troll
OI_rabbit	File with OrientationInterpolator animation and textures	3DMCe, OI	OI_rabbit	OI_rabbit	OI_rabbit
CI_box	File with CoordinateInterpolator animation	3DMCe, CI	CI_box	CI_box	CI_box
eagle-fb	File with frame-based animation	3DMCe, FAMC	eagle-fb	eagle-fb	eagle-fb
shark-fb	File with frame-based animation	3DMCe, FAMC	shark-fb	shark-fb	shark-fb
wolf-fb	File with frame-based animation	3DMCe, FAMC	wolf-fb	wolf-fb	wolf-fb
dragon-fb	File with frame-based animation	3DMCe, FAMC	dragon-fb	dragon-fb	dragon-fb
tablecloth-fb	File with frame-based animation	3DMCe, FAMC	tablecloth-fb	tablecloth-fb	tablecloth-fb
AXE_Q_CD_EG	QBCR, circular prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_Q_CD_AC	QBCR, circular prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_Q_CD_BP	QBCR, circular prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_CD_4C	QBCR, circular prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Ad_EG	QBCR, adaptive prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	axe
AXE_Q_Ad_AC	QBCR, adaptive prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Ad_BP	QBCR, adaptive prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Ad_4C	QBCR, adaptive prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Xo_EG	QBCR, XOR prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Xo_AC	QBCR, XOR prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_Q_Xo_BP	QBCR, XOR prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Xo_4C	QBCR, XOR prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Di_EG	QBCR, differential prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_Q_Di_BP	QBCR, differential prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	axe
AXE_Q_Di_4C	QBCR, differential prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_CD_EG	SVA, circular prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_CD_AC	SVA, circular prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_S_CD_BP	SVA, circular prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_S_CD_4C	SVA, circular prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	axe
AXE_S_Ad_EG	SVA, adaptive prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Ad_AC	SVA, adaptive prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_S_Ad_BP	SVA, adaptive prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Ad_4C	SVA, adaptive prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Xo_EG	SVA, XOR prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	axe
AXE_S_Xo_AC	SVA, XOR prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_S_Xo_BP	SVA, XOR prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Xo_4C	SVA, XOR prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Di_EG	SVA, differential prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Di_AC	SVA, differential prediction, Arithmetic coding	SC3DMC	N/A	N/A	axe
AXE_S_Di_BP	SVA, differential prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_S_Di_4C	SVA, differential prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_CD_EG	TFAN, circular prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_CD_AC	TFAN, circular prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_CD_BP	TFAN, circular prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	axe
AXE_T_CD_4C	TFAN, circular prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe

Name (for bitstream filename, add .mp4)	Attribute/Parameter	AFX codecs	X3D file (.x3d)	XMT file (.xmt)	COLLADA file (.dae)
AXE_T_Ad_EG	TFAN, adaptive prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Ad_AC	TFAN, adaptive prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_Ad_BP	TFAN, adaptive prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Ad_4C	TFAN, adaptive prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	axe
AXE_T_Xo_EG	TFAN, XOR prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Xo_AC	TFAN, XOR prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_Xo_BP	TFAN, XOR prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Xo_4C	TFAN, XOR prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Di_BP	TFAN, differential prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Di_4C	TFAN, differential prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_EG	TFAN, TFAN-based parallelogram prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_AC	TFAN, TFAN-based parallelogram prediction, Arithmetic coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_BP	TFAN, TFAN-based parallelogram prediction, Bit precision entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_4C	TFAN, TFAN-based parallelogram prediction, 4-bit entropy coding	SC3DMC	N/A	N/A	Axe
AXE_T_Tf_EG_VO	TFAN with vertex ordering preservation, TFAN-based parallelogram prediction, Exponential Golomb entropy coding	SC3DMC	N/A	N/A	Axe