

# ISO/IEC 15444-13:2008-07 (E)

## Information technology\_ - JPEG\_2000 image coding system: An entry level JPEG\_2000 encoder

---

### CONTENTS

	<i>Page</i>
1 Scope .....	1
1.1 Context .....	1
1.2 Requirements .....	1
2 References .....	1
2.1 Identical Recommendations   International Standards .....	1
3 Definitions .....	2
4 Abbreviations and symbols.....	5
4.1 Abbreviations.....	5
4.2 Symbols .....	5
5 General description .....	6
5.1 Codestream.....	6
5.2 Coding principles.....	6
6 Encoder requirements.....	8
6.1 General .....	8
6.2 Encoder function definition.....	8
6.3 Implementation.....	12
6.4 Codestream description .....	13
7 Optional file format requirements .....	13
Annex A – Codestream syntax.....	14
Annex B – Image and compressed image data ordering .....	15
Annex C – Arithmetic entropy coding .....	16
C.1 Binary encoding.....	16
C.2 Description of the arithmetic encoder.....	17
Annex D – Coefficient bit modelling .....	25
D.1 Code-block scan pattern within code-blocks .....	25
D.2 Coefficient bits and significance .....	25
D.3 Encoding passes over the bit-planes .....	26
D.4 Initializing and terminating .....	29
D.5 Error resilience segmentation symbol.....	31
D.6 Selective arithmetic coding bypass .....	31
D.7 Vertically causal context formation.....	32
D.8 Flow diagram of the code-block coding .....	32
Annex E – Quantization .....	35
E.1 Inverse quantization procedure (Informative).....	35
E.2 Scalar coefficient quantization .....	36
Annex F – Discrete wavelet transformation of tile-components .....	37
F.1 Tile-component parameters .....	37
F.2 Discrete wavelet transformations.....	37
F.3 Forward transformation .....	37
F.4 Sub-sampling of components.....	45
F.5 Visual frequency weighting.....	45

Annex G – DC level shifting and multiple component transformations .....	48
G.1 DC level shifting of tile-components .....	48
G.2 Forward reversible multiple component transformation (RCT).....	48
G.3 Forward irreversible multiple component transformation (ICT).....	49
G.4 Chrominance component sub-sampling and the reference grid .....	49
Annex H – Coding of images with regions of interest.....	50
H.1 Description of the Maxshift method .....	50
H.2 Remarks on region of interest coding .....	51
Annex I – JP2 file format syntax .....	53