DIN EN ISO 19144-2:2024-09 (E)

Geographic information - Classification systems - Part 2: Land Cover Meta Language (LCML) (ISO 19144-2:2023); English version EN ISO 19144-2:2023

Contents

Page

Foreword ... **vi**

Introduction ... **viii**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms, definitions and abbreviated terms ... **1**
3.1 Terms and definitions ... 1
3.2 Abbreviated terms ... 4

4 Conformance ... **4**
4.1 Conformance requirements and testing ... 4
4.2 Conformance classes ... 4
4.3 Conformance class 1 — Description of a Land Cover classification system ... 4
4.4 Conformance class 2 — Comparison of Land Cover classification systems ... 4

5 Notation ... **4**

6 Context ... **5**

7 Conceptual basis ... **7**
7.1 Definition adopted for Land Cover ... 7
7.2 Geometric aspects of classification ... 7
7.3 Relationship to Land Use ... 8
7.4 LCML approach to class definition ... 8
7.4.1 LCML basic principle ... 8
7.4.2 Land cover classification system design criteria ... 8
7.4.3 General rules for classification ... 9
7.4.4 Land cover metalanguage-elements ... 9
7.4.5 Layering ... 9
7.4.6 Packages ... 9

8 LCML objects ... **10**
8.1 Overview of LCML objects ... 10
8.2 Relation to ISO 19144-1 ... 11
8.3 Composition of a LC_LandCover object ... 11
8.4 Elements of the LCML metamodel ... 12
8.5 High level structure ... 12
8.5.1 High level structure subtypes ... 12
8.5.2 High level structure classes ... 12
8.6 Land Cover Meta Language object structure ... 13
8.6.1 Land Cover Meta Language object structure subtypes ... 13
8.6.2 Land Cover Meta Language object structure classes ... 16
8.7 LC_Element ... 24
8.7.1 LC_Element subtypes ... 24
8.7.2 LC_Element classes ... 25
8.8 LC_VegetationElement ... 25
8.8.1 LC_VegetationElement subtypes ... 25
8.8.2 LC_VegetationElement classes ... 25
8.9 LC_GrowthForm ... 26
8.9.1 LC_GrowthForm subtypes ... 26
8.9.2 LC_GrowthForm classes ... 27
8.10 LC_WoodyGrowthForm ... 28
8.10.1 LC_WoodyGrowthForm subtypes ... 28
8.10.2 LC_WoodyGrowthForm classes ... 29
8.11 LC_HerbaceousGrowthForm ... 32
8.11.1 LC_HerbaceousGrowthForm subtypes ... 32
8.11.2 LC_HerbaceousGrowthForm classes ... 32

8.12 LC_LichenAndMoss ... 34
8.12.1 LC_LichenAndMoss subtypes ... 34
8.12.2 LC_LichenAndMoss classes ... 34
8.13 LC_AbioticElement ... 35
8.13.1 LC_AbioticElement subtypes ... 35
8.13.2 LC_AbioticElement classes ... 35
8.14 LC_ArtificialSurfaceElement ... 36
8.14.1 LC_ArtificialSurfaceElement subtypes ... 36
8.14.2 LC_ArtificialSurface classes ... 36
8.15 LC_NaturalSurfaceElement ... 36
8.15.1 LC_NaturalSurfaceElement subtypes ... 36
8.15.2 LC_NaturalSurfaceElement classes ... 37
8.16 LC_WaterBodyAndAssociatedSurfaceElement ... 37
8.16.1 LC_WaterBodyAndAssociatedSurfaceElement subtypes ... 37
8.16.2 LC_WaterBodyAndAssociatedSurfaceElement classes ... 38
8.17 LC_BuiltUpSurface ... 41
8.17.1 LC_BuiltUpSurface subtypes ... 41
8.17.2 LC_BuiltUpSurface classes ... 42
8.18 LC_NonBuiltUpSurface ... 43
8.18.1 LC_NonBuiltUpSurface subtypes ... 43
8.18.2 LC_NonBuiltUpSurface classes ... 44
8.19 LC_RocksSurfaceElement ... 45
8.19.1 LC_RocksSurface subtypes ... 45
8.19.2 LC_RocksSurfaceElement classes ... 45
8.20 LC_SoilSandDepositsSurfaceElement ... 46
8.20.1 LC_SoilSandDepositsSurfaceElement subtypes ... 46
8.20.2 LC_SoilSandDepositsSurfaceElement classes ... 47
8.21 LC_ClassCharacteristic ... 50
8.21.1 LC_ClassCharacteristic subtypes ... 50
8.21.2 LC_ClassCharacteristic classes ... 51
8.22 LC_LandCoverElementCharacteristic ... 53
8.22.1 LC_LandCoverElementCharacteristic subtypes ... 53
8.22.2 LC_LandCoverElementCharacteristic classes ... 54
8.23 LC_GrowthFormCharacteristic ... 55
8.23.1 LC_GrowthFormCharacteristic subtypes ... 55
8.23.2 LC_GrowthFormCharacteristic classes ... 57
8.24 LC_NameAttributionCriteria ... 59
8.24.1 LC_NameAttributionCriteria subtypes ... 59
8.24.2 LC_NameAttributionCriteria classes ... 60
8.25 LC_CultivatedAndManagedVegetationCharacteristic ... 61
8.25.1 LC_CultivatedAndManagedVegetationCharacteristic subtypes ... 61
8.25.2 LC_CultivatedAndManagedVegetationCharacteristic classes ... 62
8.26 LC_ArtificialSurfaceCharacteristic ... 65
8.26.1 LC_ArtificialSurfaceCharacteristic subtypes ... 65
8.26.2 LC_ArtificialSurfaceCharacteristic classes ... 66
8.27 LC_WaterAndAssociatedSurfaceCharacteristic ... 67
8.27.1 LC_WaterAndAssociatedSurfaceCharacteristic subtypes ... 67
8.27.2 LC_WaterAndAssociatedSurfaceCharacteristic classes ... 68
8.28 LC_ValueObject permitted numeric values ... 69
8.28.1 LC_ValueObject general description ... 69
8.28.2 LC_ValueObject types ... 71

9 Extension of the LCML ... 74
9.1 Extension process ... 74
9.2 Registration of extensions ... 74
9.3 Backward compatibility through registration ... 75

Annex A (normative) **Abstract test suite ... 76**

Annex B (informative) **The relationship of the LCML to the General Feature Model of ISO 19109** **78**
Annex C (informative) **Examples of the use of LCML** **81**
Annex D (informative) **Glossary of Land Cover meta-elements** **112**
Annex E (informative) **Backward compatibility** **131**
Annex F (informative) **The vertical and horizontal characterization of Land Cover features** **134**
Bibliography **144**