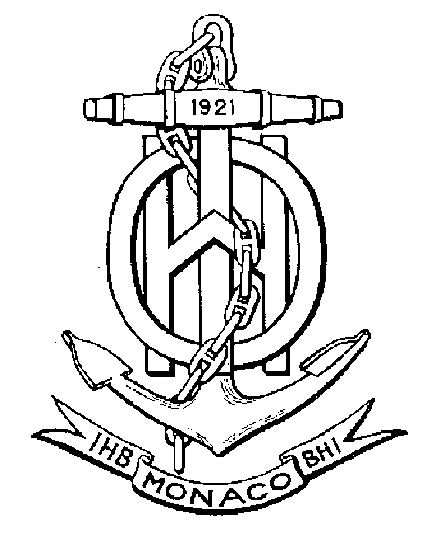
C:\Documents and Settings\julia.powell\My Documents\IHO TSMAD\S100-0 main\IHO S-100 Main Oct 1 2007.doc © ISO/IEC 2007 – All rights reservedISO-IEC\_ 63Complementary elementIntroductory element — Main elementÉlément introductif — Élément central — Élément complémentaireIntroductory element — Main element — Complementary elementE2007-10-2 ISO/IECISO/IEC     2007 ISO/IEC ISO/IEC \_(E).        2Heading 2Heading 1    02 STD Version 2.1c20   4             INTERNATIONAL HYDROGRAPHIC ORGANIZATION



S-129 Under Keel Clearance Management Information

Product Specification

**201X**

Published by the

International Hydrographic Bureau

MONACO

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| Version Number | Date | Author | Purpose |
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<NOTE: This template is to be used by developers of S-100 based product specifications. The main guidance for creating an S-100 product specification is found in S-100 Part 11. However, it may be necessary to refer to other parts of S-100 for more information and guidance for particular sections, therefore references to relevant parts of S-100 have been added to certain clause headings.>

# Overview

S-129 is the Under Keel Clearance Management Product Specification produced by the IHO.

This specification is intended to provide a suitable format for the exchange of digital data pertaining to maritime safety and efficiency of marine traffic. This specification creates a digital format with the necessary attribution features to enable the exchange of information between an under keel clearance management system and the onboard navigation system.

<This clause provides general introductory information about the product specification>

## Introduction

A Ship’s Master has an obligation in SOLAS regulation V/34 to plan their passage from berth to berth. This Product Specification allows integrated under keel clearance management information to be provided for users by a UKCM service.

<Provide a general introduction regarding the intent and use of this product specification

## References

S-100 IHO Universal Hydrographic Data Model

S-52 IHO Specifications for Chart Content and Display Aspects of ECDIS

## Terms, definitions and abbreviations

### Use of Language

<This clause is optional>

Within this document:

* “Must” indicates a mandatory requirement.
* “Should” indicates an optional requirement, that is the recommended process to be followed, but is not mandatory.
* “May” means “allowed to” or “could possibly”, and is not mandatory.

### Terms and Definitions

<Insert Terms and Definitions>

### Abbreviations

This product specification adopts the following convention for presentation purposes:

ECDIS Electronic Chart Display Information System

ENC Electronic Navigation Chart

UKCM Under Keel Clearance Management

UML Universal Modelling Language

## General Data Product Description

<This clause provides general information regarding the product>

Title:

Abstract:

Content:

Spatial Extent:

Description:

East Bounding Longitude:

West Bounding Longitude:

North Bounding Latitude:

South Bounding Latitude

Purpose:

## Data product specification metadata

<This information uniquely identifies this Product Specification and provides information about its creation and maintenance. For further information on dataset metadata see the metadata clause.>

Title:

S-100 Version:n.0.0

S-10n Version: n.0.0

Date:

Language:

Classification:

Contact:

URL:

Identifier:

Maintenance:

### IHO Product Specification Maintenance

<This clause should be retained in IHO Product Specifications, for non IHO Product Specifications it may be removed or modified to meet the needs of the organization.>

#### Introduction

Changes to S-129 will be released by the IHO as a new edition, revision, or clarification.

#### New Edition

New Editionsof S-129 introduce significant changes. *New Editions* enable new concepts, such as the ability to support new functions or applications, or the introduction of new constructs or data types. *New Editions* are likely to have a significant impact on either existing users or future users of S-129.

#### Revisions

*Revisions* are defined as substantive semantic changes to S-129. Typically, revisions will change S-129 to correct factual errors; introduce necessary changes that have become evident as a result of practical experience or changing circumstances. A *revision* must not be classified as a clarification. *Revisions* could have an impact on either existing users or future users of S-129. All cumulative *clarifications* must be included with the release of approved corrections revisions.

Changes in a revision are minor and ensure backward compatibility with the previous versions within the same Edition. Newer revisions, for example, introduce new features and attributes. Within the same Edition, a dataset of one version could always be processed with a later version of the feature and portrayal catalogues.

In most cases a new feature or portrayal catalogue will result in a revision of S-129.

#### Clarification

Clarifications are non-substantive changes to S-129. Typically, clarifications: remove ambiguity; correct grammatical and spelling errors; amend or update cross references; insert improved graphics in spelling, punctuation and grammar. A clarification must not cause any substantive semantic change to S-10n.

Changes in a clarification are minor and ensure backward compatibility with the previous versions within the same Edition. Within the same Edition, a dataset of one clarification version could always be processed with a later version of the feature and portrayal catalogues, and a portrayal catalogue can always rely on earlier versions of the feature catalogues.

#### Version Numbers

The associated version control numbering to identify changes (n) to S-129 must be as follows:

New Editions denoted as **n**.0.0

Revisions denoted as n.**n**.0

Clarifications denoted as n.n.**n**

# Specification Scopes

< Some parts of a product specification may apply to the whole product whereas other parts of the product specification may apply to parts of the product. Coordinate reference system will generally apply to the complete product; whereas maintenance regimes may be different for features. If a specification is homogeneous across the whole data product it is only necessary to define a general scope (root scope), to which each section of the data product specification applies>

Scope ID:

Level:

Level name:

# Dataset Identification

<Information that uniquely identifies the dataset>

Title:

Alternate Title:

Abstract:

Topic Category:

Geographic Description:

Spatial Resolution:

Purpose:

Language:

Classification: Data can be classified as one of the following:

Unclassified

Restricted

Confidential

Secret

Top Secret

Spatial Representation Type:

Point of Contact:

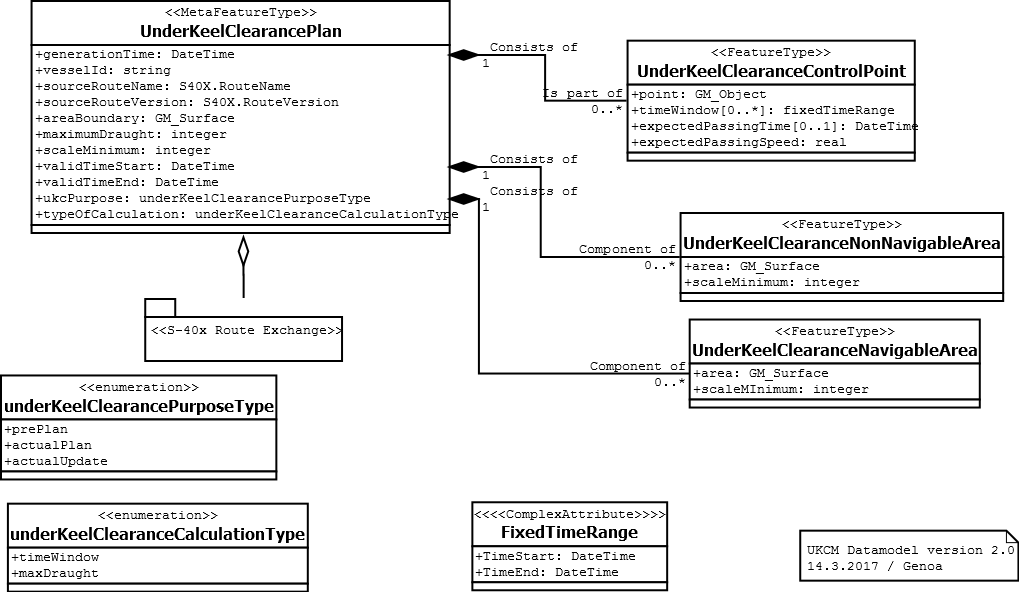
Use Limitation:

# Data Content and structure

## Introduction

<This template was designed for feature based product specifications. Although the conventional approach is to consider an image or a grid as a unique entity on its own, and to not consider a feature structure, it is proper to consider imagery, gridded and coverage data as feature oriented data. In the simplest form, an image or any set of gridded data can be considered as a single feature. Thus rules for application schema for feature data apply to imagery and gridded data. However, care must be taken to ensure that the application schema accurately defines the Imagery and Gridded Data Spatial Schema in accordance with S-100 Part 8 Clause 8-6 and the Gridded Data Spatial Referencing as defined in Clause 8-8. If the product contains a series or set of images or gridded data sets, then the application schema defining the spatial relationships should be defined as specified in S-100 Part 8 Clause 8-7. >

## Application Schema <S-100 Part 3>





## Fig X -

## 4.2.1 UnderKeelClearancePlan

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **dataType** | **Remarks** |
| Class | UnderKeelClearancePlan | A UKC plan calculated for a particular vessel and a particular passage |  | MetaFeatureType |  |
| Attribute | generationTime | Time the plan was generated | 1 | DateTime |  |
| Attribute | vesselID | Unique identification of the vessel used for the calculation | 1 | CharacterString |  |
| Attribute | sourceRouteName | Identification of the route used as a source for the calculation | 0..1 | S40X.RouteName |  |
| Attribute | sourceRouteVersion | Identification of the route used as a source for the calculation | 0..1 | S40X.RouteVersion |  |
| Attribute | areaBoundary | Boundaries of the Under Keel Clearance management area | 1 | GM\_Surface |  |
| Attribute | maximumDraught | The maximum vessel draught in meters, used as base for the calculation | 1 | integer |  |
| Attribute | scaleMinimum | Display range for ECDIS | 1 | integer |  |
| Attribute | validTimeStart | Validity start time of the current calculation | 1 | DateTime |  |
| Attribute | validTimeEnd | Validity end time of the current calculation | 1 | DateTime |  |
| Attribute | ukcPurpose | The purpose of the current calculation | 1 | underKeelClearancePurposeType |  |
| Attribute | typeOfCalculation | The type of calculation | 1 | underKeelClearanceCalculationType |  |

**4.2.2** **UnderKeelClearanceControlPoint**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **Data Type** | **Remarks** |
| Class | UnderKeelClearanceControlPoint | Especially selected critical passage point or line. |  | FeatureType |  |
| Attribute | point | Point or line geometry describing the critical passage | 1 | GM\_Object |  |
| Attribute | timeWindow | Time windows assigned to vessel for this controlpoint | 0..\* | FixedTimeRange | Only preplan can have multiple timeWindows. |
| Attribute | expectedPassingTime | The expected passing time at this point. (Within the timeWindow) | 0..1 | DateTime | This time shall reflect the schedule used for generating areas |
| Attribute | expectedPassingSpeed | The planned average speed between consecutive control points. | 0..1 | real |  |

## 4.2.3 UnderKeelClearanceNonNavigableArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **dataType** | **Remarks** |
| Class | UnderKeelClearanceNonNavigableArea | An area of depth less than the calculated safe limit. |  | FeatureType | The area has a time-dependent dimension |
| Attribute | area |  | 1 | GM\_Surface |  |
| Attribute | scaleMinimum |  | 1 | integer |  |

## 4.2.4 UnderKeelClearanceNavigableArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **Data Type** | **Remarks** |
| Class | UnderKeelClearanceNavigableArea | An area of depth more than the calculated safe limit. |  | FeatureType | The area has a time-dependent dimension |
| Attribute | area |  | 1 | GM\_Surface |  |
| Attribute | scaleMinimum |  | 1 | integer |  |

<Normally, the full application schema is described in this section. It can be described using UML, however, for specifications that have large application schemas it can also be realised in the feature catalogue and the product specification can contain specific examples.>

## Feature Catalogue <S-100 Part 5>

### Introduction

<The S-10n Feature Catalogue describes the feature types, information types, attributes, attribute values, associations and roles which may be used in the product.

The S-10n Feature Catalogue is available in an XML document which conforms to the S-100 XML Feature Catalogue Schema and can be downloaded from the IHO website.

Note, for Imagery and Gridded Data, a coverage is a type of feature so a product specification may not contain a “catalogue” with the exception of the environmental parameter the dataset models. Therefore much of this clause may be irrelevant. >

### Feature Types

<The following clauses describe the different feature types that may be used in the feature catalogue.>

#### Geographic

<Geographic (geo) feature types form the principle content of the dataset and are fully defined by their associated attributes and information types.>

#### Meta

<Meta features contain information about other features within a data set. Information defined by meta features override the default metadata values defined by the data set descriptive records.

Meta features must be used to their maximum extent to reduce meta attribution on individual features.>

### Feature Relationship

<A feature relationship links instances of one feature type with instances of the same or a different feature type. There are three common types of feature relationship: Association, Aggregation and Composition >

### Information Types

<Information types are identifiable pieces of information in a dataset that can be shared between other features. They have attributes but have no relationship to any geometry; information types may reference other information types.>

### Attributes

<The following clauses specify the different types of attributes that may be used in a product specification. They may be either simple or complex.>

## FixedTimeRange

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **Data Type** | **Remarks** |
| Complex | FixedTimeRange |  |  |  |  |
| Attribute | TimeStart |  | 1 | DateTime |  |
| Attribute | TimeEnd |  | 1 | DateTime |  |

# Enumerations

## underKeelClearancePurposeType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **Data Type** | **Remarks** |
| Enumeration | underKeelClearancePurposeType |  |  |  |  |
| Literal | actualPlan |  |  |  |  |
| Literal | actualUpdate |  |  |  |  |

## underKeelClearanceCalculationType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Description** | **Multiplicity** | **Data Type** | **Remarks** |
| Enumeration | underKeelClearanceCalculationType | Indication of how the plan was calculated |  |  |  |
| Literal | timeWindow | UkcPlan returns available TimeWindow(s) for given draught |  |  |  |
| Literal | maxDraught | UkcPlan returns maximum draught for given TimeWindow |  |  |  |

#### Simple Attributes

< The following table is an example of the different types of simple attributes.>

|  |  |
| --- | --- |
| **Type** | **Definition** |
| Enumeration | A fixed list of valid identifiers of named literal values |
| Boolean | A value representing binary logic. The value can be either *True* or *False*. The default state for Boolean type attributes (i.e. where the attribute is not populated for the feature) is *False*. |
| Real | A signed Real (floating point) number consisting of a mantissa and an exponent |
| Integer | A signed integer number. The representation of an integer is encapsulation and usage dependent. |
| CharacterString | An arbitrary-length sequence of characters including accents and special characters from a repertoire of one of the adopted character sets |
| Date | A date provides values for year, month and day according to the Gregorian Calendar. Character encoding of a date is a string which must follow the calendar date format (complete representation, basic format) for date specified by ISO 8601:1988.  EXAMPLE 19980918 (YYYYMMDD) |
| Time | A time is given by an hour, minute and second. Character encoding of a time is a string that follows the local time (complete representation, basic format) format defined in ISO 8601:1988.  EXAMPLE 183059 or 183059+0100 or 183059Z |
| Date and Time | A DateTime is a combination of a date and a time type. Character encoding of a DateTime must follow ISO 8601:1988  EXAMPLE 19850412T101530 |

## Dataset Types

### Introduction

<There is the capability to have different types of datasets, typically they are classified as complete, scale dependent and scale independent. Most products that are designed to be used with an ENC will be of a complete nature – where it contains the information needed to form a complete picture.>

## Dataset Loading and Unloading

<This section is only needed if the intended product specification has datasets that have multiple scales and would require a loading strategy>

## Geometry <S-100 Part 7>

<Geometric representation is the digital description of the spatial component of an object as described in S-100 and ISO 19107. Specify which S-100 Level of Geometry is to be used in the product specification.>

# Coordinate Reference Systems (CRS) <S-100 Part 6>

## Introduction

<This clause specifies the type of Coordinate Reference System used in the product.>

Spatial reference system:

Projection:

Vertical coordinate reference system:

Temporal reference system:

Coordinate reference system registry: [EPSG Geodetic Parameter Registry](http://www.epsg-registry.org/)

Date type (according to ISO 19115):

Responsible party: International Organisation of Oil and Gas Producers (OGP)

URL: <http://www.ogp.org.uk/>

Coordinate reference system identifier (CRSID):

Code space:

# Data Quality

<The data quality overview element should include at least the intended purpose and statement of quality or lineage. Other data quality elements cover: completeness, logical consistency, positional accuracy, temporal accuracy, thematic accuracy, and anything specifically required for the product being specified.>

# Data Capture and Classification

<The data product specification must provide information on how the data is to be captured. This should be as detailed and specific as necessary.>

# Maintenance

Maintenance and Update Frequency:

Data Source:

Production Process:

# Portrayal <S-100 Part 9>

Recommend the following objects be used to portrayal the outputs for Under Keel Clearance information:

1. Area Overlay
   1. Consideration should be given to whether the display should be configurable either to show or not to show “go” area.
      1. If selected to show the “go” area, the result is suppression of the depth area from the original ENC.
   2. Caution or warning area that will show that an area could potentially be a problem if factors change.
      1. Must have colour for day/night
      2. Recommend using one or both methods of symbolizing area:
         1. Recommend using semi-transparent colour fill should show through, and all other information is drawn on top (per IHO S-52 Appendix 2).
            1. Colour used be a appropriate contrast to the existing background ENC.
         2. Recommend using one-sided complex linestyles: to identify the side of the boundary line on which the area lies (per IHO S-52 Appendix 2).
   3. Indicate “no-go” area
      1. Must have colour for day/night
      2. Recommend using one or both methods of symbolizing area:
         1. Recommend using semi-transparent colour fill should show through, and all other information is drawn on top (per IHO S-52 Appendix 2).
         2. Recommend using one-sided complex linestyles: to identify the side of the boundary line on which the area lies (per IHO S-52 Appendix 2).
   4. The “no-go” and caution area features will need to be dynamically updated as input factors change.
2. Tidal Time Markers
   1. Recommend using a line with associated text which relates the location and date of safe passage based on speed of vessel.
      1. The text information will need to be dynamic and update as input factors change (i.e. vessel speed, water level changes, vessel squat, weather).
      2. The pattern and colour of the line should not be distracting and must be distinguishable from chart data.
      3. The size and colour of the text should not cause clutter or distract, and should be kept to a minimum.
         1. Recommend using format: [DDMMMYYYY to HHMM use the same format as established for time dependent features in ECDIS]
         2. Recommend using 24 hour format.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Name** | **Description** | **M/O** | **Card** | **type** |
| portrayalLibraryCitation | Bibliographic reference to the portrayal library | O | 0..1 | CI\_Citation (ISO 19115) |

# Data Product format (encoding) <S-100 Part 10>

## Introduction

<This clause specifies the encoding for S-10n datasets. While various encodings may be used such as GML and XML, if the primary intent is that this data will be used in conjunction with S-101 ENCs and on an ECDIS, then if possible the S-100 8211 encoding should be used.>

Format Name:

Version:

Character Set:

Specification:

# Data Product Delivery

## Introduction

<This clause specifies the delivery mechanisms for datasets. >

Units of Delivery:

Transfer Size:

Medium Name:

Other Delivery Information:

## Dataset

### Datasets

<Specify the types of datasets (New Edition, Update, Re-issue)>

#### Dataset size

<Specify the maximum dataset size>

### Dataset file naming

<Specify the dataset naming convention>

## Support Files

<Specify if the product will utilize support files>

### Support File Naming

<Specify if naming convention for support files>

## Exchange Catalogue

<Specify if the datasets will be part of an exchange catalogue>

# Metadata <S-100 Part 4>

## Introduction

<This clause specifies the discovery metadata for the dataset, it is usually in an XML format and conforms to S-100 metadata.>

## Language

<Specify the language to be used>

## S100\_ExchangeCatalogue

Each exchange set has a single S100\_ExchangeCatalogue which contains meta information for the data and support files in the exchange set.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_ExchangeCatalogue | An exchange catalogue contains the discovery metadata about the exchange datasets and support files | - | - | - |
| identifier | Uniquely identifies this exchange catalogue | 1 | S100\_CatalogueIdentifier |  |
| contact | Details about the issuer of this exchange catalogue | 1 | S100\_CataloguePointOfContact |  |
| productSpecification | Details about the product specifications used for the datasets contained in the exchange catalogue | 0..1 | S100\_ProductSpecification | Conditional on all the datasets using the same product specification |
| metadataLanguage | Details about the Language | 1 | CharacterString |  |
| exchangeCatalogueName | Catalogue filename | 1 | CharacterString | In S-101 it would be CATLOG.101 |
| exchangeCatalogueDescription | Description of what the exchange catalogue contains | 1 | CharacterString |  |
| exchangeCatalogueComment | Any additional Information | 0..1 | CharacterString |  |
| compressionFlag | Is the data compressed | 0..1 | Boolean | Yes or No |
| algorithmMethod | Type of compression algorithm | 0..1 | CharacterString | Eg. RAR or ZIP |
| sourceMedia | Distribution media | 0..1 | CharacterString |  |
| replacedData | If a data file is cancelled is it replaced by another data file | 0..1 | Boolean |  |
| dataReplacement | Cell name | 0..1 | CharacterString |  |

### S100\_CatalogueIdentifier

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_CatalogueIdentifier | An exchange catalogue contains the discovery metadata about the exchange datasets and support files | - | - | - |
| identifier | Uniquely identifies this exchange catalogue | 1 | CharacterString |  |
| editionNumber | The edition number of this exchange catalogue | 1 | CharacterString |  |
| date | Creation date of the exchange catalogue | 1 | Date |  |

### S100\_CataloguePointofContact

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | | **Type** | **Remarks** |
| S100\_CataloguePointOfContact | Contact details of the issuer of this exchange catalogue | - | - | | - |
| organization | The organization distributing this exchange catalogue | 1 | CharacterString | | This could be an individual producer, value added reseller, etc. |
| phone | The phone number of the organization | 0..1 | CI\_Telephone | |  |
| address | The address of the organization | 0..1 | CI\_Address | |  |

## S100\_DatasetDiscoveryMetaData

| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| --- | --- | --- | --- | --- |
| S100\_DatasetDiscoveryMetadata | Metadata about the individual datasets in the exchange catalogue | - | - | - |
| fileName | Dataset file name | 1 | CharacterString |  |
| filePath | Full path from the exchange set root directory | 1 | CharacterString | Path relative to the root directory of the exchange set. The location of the file after the exchange set is unpacked into directory <EXCH\_ROOT> will be <EXCH\_ROOT>/<filePath>/<filename> |
| description | Short description giving the area or location covered by the dataset | 1 | CharacterString | E.g. a harbour or port name, between two named locations etc. |
| dataProtection | Indicates if the data is encrypted | 0..1 | Boolean | 0 indicates an unencrypted dataset  1 indicates an encrypted dataset |
| protectionScheme | specification or method used for data protection | 0..1 | CharacterString | Eg S-63 |
| digitalSignature | Indicates if the data has a digital signature | 0..1 | CharacterString |  |
| copyright | Indicates if the dataset is copyrighted | 0..1 | MD\_LegalConstraints ->MD\_RestrictionCode <copyright> (ISO 19115) |  |
| classification | Indicates the security classification of the dataset | 0..1 | Class  MD\_SecurityConstraints>MD\_ClassificationCode (codelist) | 1. unclassified  2. restricted  3. confidential  4. secret  5. top secret |
| purpose | The purpose for which the dataset has been issued | 1 | MD\_Identification>purpose  CharacterString | E.g. new, re-issue, new edition, update etc. |
| specificUsage | The use for which the dataset is intended | 1 | MD\_USAGE>specificUsage (character string)  MD\_USAGE>userContactInfo (CI\_ResponsibleParty) | E.g. in the case of ENCs this would be a navigation purpose classification. |
| editionNumber | The edition number of the dataset | 1 | CharacterString | when a data set is initially created, the edition number 1 is assigned to it. The edition number is increased by 1 at each new edition. Edition number remains  the same for a re-issue. |
| updateNumber | Update number assigned to the dataset and increased by one for each subsequent update | 1 | CharacterString | Update number 0 is assigned to a new dataset. |
| updateApplicationDate | this date is only used for the base cell files (i.e. new data sets, re-issue and new  edition), not update cell files. All updates dated on or before this date must have  been applied by the producer | 0..1 | Date |  |
| issueDate | date on which the data was made available by the data producer | 1 | Date |  |
| productSpecification | The product specification used to create this dataset | 1 | S100\_ProductSpecification |  |
| producingAgency | Agency responsible for producing the data | 1 | CI\_ResponsibleParty |  |
| optimumDisplayScale | The scale with which the data is optimally displayed | 0..1 | Integer | Example: A scale of 1:25000 is encoded as 25000 |
| maximumDisplayScale | The maximum scale with which the data is displayed | 0..1 | Integer |  |
| minimumDisplayScale | The minimum scale with which the data is displayed | 0..1 | Integer |  |
| horizontalDatumReference | Reference to the register from which the horizontal datum value is taken | 1 | characterString | EPSG |
| horizontalDatumValue | Horizontal Datum of the entire dataset | 1 | Integer | 4326 |
| verticalDatum | Vertical Datum of the entire dataset | 1 | S100\_VerticalAndSoundingDatum |  |
| soundingDatum | Sounding Datum of the entire dataset | 1 | S100\_VerticalAndSoundingDatum |  |
| dataType | The encoding format of the dataset | 1 | S100\_DataFormat |  |
| otherDataTypeDescription | Encoding format other than those listed. | 0..1 | CharacterString |  |
| dataTypeVersion | The version number of the dataType. | 1 | CharacterString |  |
| dataCoverage | Provides information about data coverages within the dataset | 1..\* | S100\_DataCoverage |  |
| comment | any additional information | 0..1 | CharacterString |  |

### S100\_DataCoverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_DataCoverage |  | - | - | - |
| ID | Uniquely identifies the coverage | 1 | Integer | - |
| boundingBox | The extent of the dataset limits | 1 | EX\_GeographicBoundingBox | - |
| boundingPolygon | A polygon which defines the actual data limit | 1..\* | EX\_BoundingPolygon | - |
| optimumDisplayScale | The scale with which the data is optimally displayed | 0..1 | Integer | Example: A scale of 1:25000 is encoded as 25000 |
| maximumDisplayScale | The maximum scale with which the data is displayed | 0..1 | Integer |  |
| minimumDisplayScale | The minimum scale with which the data is displayed | 0..1 | Integer |  |

### S100\_VerticalAndSoundingDatum

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_VerticalAndSoundingDatum | Allowable vertical and sounding datums | - | - | - |
| meanLowWaterSprings |  | - | - | - |
| meanSeaLevel |  | - | - | - |
| meanLowerLowWaterSprings |  | - | - | - |
| lowestLowWater |  | - | - | - |
| meanLowWater |  | - | - | - |
| lowestLowWaterSprings |  | - | - | - |
| approximateMeanLowWaterSprings |  | - | - | - |
| indianSpringLowWater |  | - | - | - |
| lowWaterSprings |  | - | - | - |
| approximateLowestAstronomicalTide |  | - | - | - |
| nearlyLowestLowWater |  | - | - | - |
| meanLowerLowWater |  | - | - | - |
| lowWater |  | - | - | - |
| approximateMeanLowWater |  | - | - | - |
| approximateMeanLowerLowWater |  | - | - | - |
| meanHighWater |  | - | - | - |
| meanHighWaterSprings |  | - | - | - |
| highWater |  | - | - | - |
| approximateMeanSeaLevel |  | - | - | - |
| highWaterSprings |  | - | - | - |
| meanHigherHighWater |  | - | - | - |
| equinoctialSpringLowWater |  | - | - | - |
| lowestAstronomicalTide |  | - | - | - |
| localDatum |  | - | - | - |
| internationalGreatLakesDatum1985 |  | - | - | - |
| meanWaterLevel |  | - | - | - |
| lowerLowWaterLargeTide |  | - | - | - |
| higherHighWaterLargeTide |  | - | - | - |
| nearlyHighestHighWater |  | - | - | - |
| highestAstronomicalTide |  | - | - | (HAT) |

### S100\_DataFormat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_DataFormat | The encoding format | - | - | - |
| ISO/IEC 8211 ASCII |  | - | - | - |
| ISO/IEC 8211 BINARY |  | - | - | - |
| GML |  | - | - | - |
| HDF5 |  |  |  |  |
| Other |  | - | - | - |

### S100\_ProductSpecification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_ProductSpecification | The Product Specification contains the information needed to build the specified product | - | - | - |
| name | The name of the product specification used to create the datasets | 1 | CharacterString |  |
| version | The version number of the product specification | 1 | CharacterString |  |
| date | The version date of the product specification | 1 | Date |  |

## S100\_SupportFileDiscoveryMetadata

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_SupportFiletDiscoveryMetadata | Metadata about the individual support files in the exchange catalogue | - | - | - |
| fileName | Name of the support file | 1 | CharacterString |  |
| fileLocation | Full location from the exchange set root directory | 1 | CharacterString | Path relative to the root directory of the exchange set. The location of the file after the exchange set is unpacked into directory <EXCH\_ROOT> will be <EXCH\_ROOT>/<filePath>/<filename> |
| purpose | The purpose for which the dataset has been issued | 1 | S100\_SupportFilePurpose | E.g. new, re-issue, new edition, update etc. |
| editionNumber | The edition number of the dataset | 1 | CharacterString | when a data set is initially created, the edition number 1 is assigned to it. The edition number is increased by 1 at each new edition. Edition number remains  the same for a re-issue. |
| issueDate | date on which the data was made available by the data producer | 1 | Date |  |
| productSpecification | The product specification used to create this file | 1 | S100\_ProductSpecification |  |
| dataType | The encoding format of the dataset | 1 | S100\_SupportFileFormat |  |
| otherDataTypeDescription | Encoding format other than those listed. | 0..1 | CharacterString |  |
| dataTypeVersion | The version number of the dataType. | 1 | CharacterString |  |
| comment |  | 0..1 | CharacterString |  |
| digitalSignatureReference | Digital Signature of the file | 0..1 | CharacterString | Reference to the appropriate digital signature algorithm |
| digitalSignatureValue | Value derived from the digital signature | 0..1 | CharacterString |  |
| fileName | Name of the support file | 1 | CharacterString |  |

### S100\_SupportFileFormat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_SupportFormat | The format used in the support file | - | - | - |
| ASCII |  | - | - |  |
| JPEG2000 |  | - | - |  |
| HTML |  | - | - |  |
| XML |  | - | - |  |
| XSLT |  | - | - |  |
| VIDEO |  | - | - |  |
| TIFF |  |  |  |  |

### S100\_SupportFilePurpose

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_SupportFilePurpose | The reason for inclusion of the support file in this exchange set | - | - | - |
| new | A file which is new | - | - | Signifies a new file. |
| replacement | A file which replaces an existing file | - | - | Signifies a replacement for a file of the same name |
| deletion | Deletes an existing file | - | - | Signifies deletion of a file of that name |

## S100\_CatalogueMetadata

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_Catalogue |  | - | - | - |
| filename | The name for the catalogue | 1..\* | CharacterString |  |
| fileLocation | Full location from the exchange set root director | 1..\* | CharacterString | Path relative to the root directory of the exchange set. The location of the file after the exchange set is unpacked into directory <EXCH\_ROOT> will be <EXCH\_ROOT>/<filePath>/<filename> |
| scope | Subject domain of the catalogue | 1..\* | S100\_CatalogueScope |  |
| versionNumber | The version number of the product specification | 1..\* | CharacterString |  |
| issueDate | The version date of the product specification | 1..\* | Date |  |
| productSpecification | The product specification used to create this file | 1..\* | S100\_ProductSpecification |  |
| digitalSignatureReference | Digital Signature of the file | 1 | CharacterString | Reference to the appropriate digital signature algorithm |
| digitalSignatureValue | Value derived from the digital signature | 1 | CharacterString |  |

### S100\_CatalogueScope

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Description** | **Mult** | **Type** | **Remarks** |
| S100\_CatalogueScope |  | - | - | - |
| featureCatalogue |  |  |  |  |
| portrayalCatalogue |  |  |  |  |

1. Data Classification and Encoding Guide

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IHO Definition: **FEATURE:** Definition. (Authority for definition). | | | | | | |
| **S-101 Geo Feature: Feature (S-57 Acronym)** S-101 feature and corresponding S-57 acronym | | | | | | |
| **Primitives: Point, Curve, Surface** Allowable geometric primitive(s) | | | | | | |
| *Real World*  Example if real world instance(s) of the Feature. | *Paper Chart Symbol*  Example(s) of paper chart equivalent symbology for the Feature. | | | *ECDIS Symbol*  Example(s) of ECDIS symbology for the Feature. | | |
| **S-101 Attribute** | | **S-57 Acronym** | **Allowable Encoding Value \*** | | **Type** | **Multiplicity** |
| Category of beer | |  | 1 : ale  2 : lager  3 : porter  4 : stout  5 : pilsener  6 : bock beer  7 : wheat beer | | EN | 1,1 |
| This section liststhe full list of allowable attributes for the S-101 feature. Attributes are listed in alphabetical order. Sub-attributes (Type prefix (S)) of complex (Type C) attributes are listed in alphabetical order and indented directly under the entry for the complex attribute (see below for example). | | This section liststhe corresponding S-57 attribute acronym. A blank cell indicates no corresponding S-57 acronym. | This section liststhe allowable encoding values for S-101 (for enumerate (E) Type attributes only). Further information about the attribute is available in Section XX. | | Attribute type (see clause X.X). | Multiplicity describes the “cardinality” of the attribute in regard to the feature. See clause X.X. |
| Fixed date range | |  |  | | C | 0,1 |
| Date end | | (DATEND) |  | | (S) DA | 0,1 |
| Date start | | (DATSTA) |  | | (S) DA | 0,1 |
| INT 1 Reference: The INT 1 location(s) of the Feature – by INT1 Section and Section Number.  **X.X.X Sub-clause heading(s) (see S-4 – B-YYY.Y)**  Introductory remarks. Includes information regarding the real world entity/situation requiring the encoding of the Feature in the ENC, and where required nautical cartographic principles relevant to the Feature to aid the compiler in determining encoding requirements.  Specific instructions to encode the feature.  Remarks:   * Additional encoding guidance relevant to the feature.   **X.X.X.X Sub-sub-clause heading(s) (see S-4 – B-CCC.C)**  Clauses related to specific encoding scenarios for the Feature. (Not required for all Features).  Remarks:   * Additional encoding guidance relevant to the scenario (only if required).   Distinction: List of features in the Product Specification distinct from the Feature. | | | | | | |

Feature Attributes and Enumerate Proposals

|  |
| --- |
| **Attribute Name:** IHO Definition:   1. **Enumerate Name**   IHO Definition: If Applicable   1. **Enumerate Name**   Remarks: |

|  |
| --- |
| **Attribute Name:** IHO Definition:  Unit:  Resolution:  Format:  Example:  Remarks:   * No remarks. |

Associations/Aggregations/Compositions

|  |  |  |  |
| --- | --- | --- | --- |
| **Association/Aggregation/Composition Name:** IHO Definition:  Remarks: | | | |
| **Role Type** | **Role** | **Features** | **Multiplicity** |
| Association  Aggregation  Composition |  |  |  |
|  |  |  |
|  |  |  |

1. Data Product format (encoding)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Normative Implementation Guidance

<This section should contain guidance to assist in the implementation of the product specification>

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Feature Catalogue

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Portrayal Catalogue