

Frederiksberg d. 4.10.2009

## **Comments to ISO 12006-2 and presentation of BIS Code System**

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**Findesteder:** [www.lisesbibliotek.dk](http://www.lisesbibliotek.dk) under Publikationer, Lises computerfil bis08-3

# Comments to ISO 12006-02

Lise Borup

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Presented by Lars Haggström, Systematiktjänst

# 1. Models muddle in the construction industry

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- 1.1 Models muddle in the construction industry is explained in Dictionary of Philosophy of Mario Bunge. He explains about visual, modeltheoretic and scientific and technological models and all the ongoing confusions in the modelling business, e.g. that a free model in technology - like the enterprise models in the construction industry - is built from scratch, seen as a concept of something that is hard to locate or find.
- 1.2 Reasons for this is the overall character and conditions for the arbitrary contents of the models
- 1.3 Tools to handle this arbitrary situation in modelling is the creation of a simple general and ontological framework of the categories in the processoriented model.

## 2. Classification systems are BIMs

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- **2.1** Existing classification systems like OmniClass, BSAB, Uniclass are BIMs Building Information Models of the classified and defined objects in the construction domain
- **2.2** There are 2 types of classification BIMs - one type as an overall BIM dealing with all the objects of the construction process - and the other type as a central BIM dealing with the objects of the facility or building and its parts, constructions and materials
- **2.3** Classification systems ought to be based on a clear thinking for being in control of the things for the human information sharing and for our use of the computers handling the informations of the things
- **2.4** All the objects in classification BIMs are corresponding to concepts. They all have names based on the language used as a tool in our thinking
- **2.5** Classification systems need solid theoretical foundations and standardized methods for their creations - e.g. use of the international standardized concepts and methods in the terminology domain including standardized definitions of definition

## 3. Development potential in ISO 12006-2

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- **3.1** As ISO 12006-2:2001 and ISO/DIS 12006-2 from 2008 are identical except minor verbal alterations of no importance for the meaning - it's hard to see any proposals for discussions
- **3.2** As there are two kinds of classification BIMs, the contents of terms and definitions could be separated into
  - **a)** Fundamental terms and definitions related to BIMs of the overall building process
  - **b)** Core terms and definitions related to the classifications in the central BIMs with the objects of the facility or building and its parts/elements, constructions and materials
- **3.3** This separation could make better foundations for the contents of terms and definitions in the overall processing model and in the central model used for coherent standardized common classification tables

# Ad resources and results in ISO 12006-2

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- ● The activities in construction constantly create situations, where one mans input is another mans output and visa versa. Therefore classifications of objects do not need those characteristics in their fundamental definitions. Neither do the BIMs

# Ad ISO 2.4 construction entity

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- ● May be a revised standard could create better possibilities for a separation of the objects in the infrastructural facilities and the buildings regarded as the two main areas in construction (In scandinavian and german languages there are different words for the common construction entity and words for the infrastructural facilities and building)

# Ad ISO 2.6 construction entity part, 2.7 element, 2.9 designed element)

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- ● The separation would make it more easy to handle the classification tables from that point of view, that the need is tables for elements. In the terminologi of the building process you could supply with the terms and definitions of construction entity part and designed element as more abstract processoriented concepts in no use for the creation of general applicable classification tables.
- ● Of course you could choose the term of construction entity part instead of element - as they can be defined as synonyms



## Ad 2.8 work result)

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- ● The varying existing definitions based on different views of work results makes it almost impossible to make solid theoretical and practical classifications in this domain - and leaves us with the different national and successful classification tables for work results like MasterFormat, BSAB produktionsresultat, CAWS etc all based on individual empirical foundations
- ● We are missing concepts and terms for work results, seen as coherent concepts of constructions based on the used materials and potential use in the parts - it's the used material that creates the different forms of constructions and the need for special actors and tools

## Ad 2.17 construction product

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- ● It's not easy to understand the concept of construction product in the standard in any way. All the things in the constructions or buildings are products, as somebody - nature and man - have produced those things in time and space.
- ● We are missing concepts and terms for construction products, seen as commodities of raw materials and materials
- ● And the concept of permanent connected to the definition of construction product is completely out of order - nothing in the build environment is permanent - the most permanent or lasting thing you will find is may be the gravestones

## Ad 3.2 property/characteristic)

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- ● The serious problems with properties used as basis in classifications and in specifications - is the lack of a coherent structured or classified model of the predicates of the objects related to the construction industry like in CIB Masterlist. This model/structure/classification ought to be enriched with the contents of the unstructured table 49 Properties from the OmniClass system

## 4. Presentation of BIS Code system

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- **4.1** BIS Code system is an identifying classification system for the construction industry - based on a solid theoretical and practical foundation.
- **4.2** The presented version in danish of BIS Code system is including 58 pages of explanations and examples of coded objects - and including 11 more or less finished tables
- **4.3** The central tables of BIS Code system are presenting a conceptual coherent model as a modelcomposition-classification system for the infrastructural facilities, buildings, rooms and their parts, constructions and materials.
- **4.4** The central model or BIM is illustrated through the use of the numbers in the code system and their compositions or combinations

# **TABLES OF BIS CODE SYSTEM, Central tables:**

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- BIS Code system 0 - Raw materials
- BIS Code system 1 - Materials for common use
- BIS Code system 2 - Infrastructural facilities, buildings and their parts, constructions, special materials
- BIS Code system 3 - Installations for fluids, gasses, vacuum systems, cooling and HVAC
- BIS Code system 4 - Installations for electricity and communications
- BIS Code system 5 - Installations for transportations
- BIS Code system 6 - Furnishing equipment
- BIS Code system 7 - Types and forms of buildings and rooms, prefab. buildings and rooms, standardized building systems

# **TABLES OF BIS CODE SYSTEM, Other tables:**

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- BIS Code system 8 - Materiel and tools for construction sites and maintenance
- BIS Code system 9 - Works and services - special and ordinary
- BIS Code system P - Properties of building products

## Where to find on [www.lisesbibliotek.dk](http://www.lisesbibliotek.dk)

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- BIS Code system summary, introduction, explanations, examples of codes, list of literature and Appendices - in danish - is placed there as Publication no. 03/2008 in the cronological list and under the subject c324 'BIS Kode systemet og dets tabeller'
- All the 11 tables in their different states are placed there as publications too - as listed in the list of literature and supplied with publication numbers

## 5. The BIS codes

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- **5.1** BIS codes forms a very flexible structure to handle general usable objects and projectspecific objects - that means flexible regarding an unknown future and the detailing capacities of the system
- **5.2** The notations of BIS codes automatically identifies codes from the different tables
- **5.3** The principles of the use of numbers in the BIS codes makes them simple and memorizable in all upper levels
- **5.4** The codes in BIS System 1 and 2 are developed, implementated and tested recently in a project - [www.digitaleprodukter.dk](http://www.digitaleprodukter.dk)
- **5.5** BIS Code system is not finished - e.g. codes in BIS System 1 and 2 need further refinements, and Codes for technical installations and furnishing equipment has to be developed in BIS Code quality



# EXAMPLES BIS TABLE 1 Materials for common use (stones, blocks etc)

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- 111 01 Picksten, marksten
- 111 02 Kløvede sten, sprængsten
- 111 10 Blokke i natursten
- 111 15 Overliggerere i natursten
- 111 20 Sten, blokke og overliggerere i beton
- 111 21 Sten, blokke og overliggerere i klinkerbeton
- 111 22 Sten, blokke i porebeton
- ....
- 111 30 Mursten, murblokke og overliggerere i tegl
- ....
- 111 60 Glassten til murværk
- ....

# EXAMPLES BIS TABLE 1 Materials for common use (boards based on wood)

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- 134 01 Plader i massivt træ
- 134 10 Plader i limtræ
- 134 15 Træfinerede væg- og loftspaneler
- 134 20 Krydsfiner
- 134 25 OBS plader
- 134 30 Møbelplader
- 134 40 Spånplader
- 134 50 Træfiberplader HDF
- 134 55 Træfiberplader MDF
- 134 59 Træfiberplader LDF
- 134 60 Træbetonplader
- 134 70 Plader i kunsttræ
- 134 90 Plader i andre vegetabiliske materialer

# **buildings and their parts, constructions, special materials**

## **(facilities in terrain)**

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- 211 Vandområder og landområder
- 212 Forstærkninger af undergrund, erosionsbeskyttelse, bærelag
- 213 Dræning og jordforbedringer
- 214 Omprofilering og restaurering af landskaber
- 215 Vægge, skrånninger og volde i terræn
- 216 Kyst- og landbeskyttelses anlæg
- 217 Landindvindings anlæg
- 218 Anlæg i undergrund

# **buildings and their parts, constructions, special materials**

## **(secondary facilities in terrain)**

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- 251 Småbygninger og -anlæg i terræn inkl. overdækkede læsteder
- 252 Skorstene, tårne, store master i terræn
- 253 Tanke, siloer, beholdere i terræn
- 254 Mindre broer, tunneler og kanaler i terræn
- 255 Trapper og ramper i terræn
- 256 Belægninger i terræn
- 257 Mure, hegn, rækværker, trafikværn, støjværn i terræn

# buildings and their parts, constructions, special materials

## (constructions for exterior walls)

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- 263.10 Udv. søjler og bjælker
  - 263.10 10 Udv. søjler og bjælker i beton støbt in situ
  - 263.10 20 Udv. søjler og bjælker i beton - præfab.
  - 263.10 30 Udv. søjler og bjælker i stål
  - 263.10 40 Udv. søjler og bjælker i tømmer, limtræ
- 263.20 Udv. vægge i beton støbt in situ
  - 263.20 10 Udv. vægkonstruktioner i beton støbt in situ
  - ...
- 263.30 Udv. vægge i murværk
  - 263.30 10 Udv. vægkonstruktioner i massivt murværk
  - ...
- 263.65 Udv. mobile vægge
  - 263.65 10 Udv. mobile vægge i glas
- 263.80 Specielle udv. vægge
  - 263.80 10 Fritstående vægge i vinger, brystninger mv
  - 263.80 15 Gavlvægge
  - ...

## 6. General principles in BIS Coding system

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- **6.1** The central tables of BIS Code system are based on a bottom-up approach beginning with raw materials, materials, constructions, parts/type of parts and complete facilities and buildings
- **6.2** All classifications in the upper level structures in BIS Code system are using the extensional class logics based on the human appointments of the classes or categories of objects
- **6.3** BIS Code system is based on minor alterations of concepts, terms and definitions in ISO 12006-2