

Dutch Building Hardware Association
VHS



VHS building hardware (BIM) standard

version 1.0

Introduction



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1 Terminology

BIM	Building Information Model: a technique for a conclusive and parametric building model. This technique is used in e.g. Revit and Tekla.
BMH protocol	An XML format defined by 'Bos Machine Handel' for the description of a 3D frame model for production. This protocol also contains the definitions for articles and operations, and is usable in a BIM environment
WHS protocol	A by 'DeltaPi Systems' defined XML format, based on the BMH protocol, for the definitions of articles and recipes in a BIM environment
XML format	A text format suitable for structured data.
Door/window frame	(In Dutch: kozijn) A frame with doors and/or windows and/or glass and/or panels
Geometry	The 3D shapes of an article and the applicable operations (pockets and drillholes)
Article	A hardware article that can be priced, ordered and applied in a frame
Placeholder	A temporary substitute for an end result. In this case the placeholder acts as a means to present options to the user to make a choice.
Options	Properties on an article which, while applying this article enables the user to make a choice. These properties can affect the shape or price.
Recipe	A list of conditions on which an article is placed on a specific spot in a frame.
Cluster	A coherent combination of files for a specific hardware series

2 Introduction

The VHS Hardware Standard defines a conclusive description of the information of hardware (locks, hinges etc.) usable in a 3D BIM environment.

It is primarily meant for use by the door and window manufacturer. It focusses on information needed for price calculation, modelling, producing and maintenance of window and door and their frames. It offers tools for safe and conclusive application of hardware and avoidance of redundancy and double work for all participants in the process.

The VHS building hardware standard aims for an efficient workflow by the window and door manufacturer for calculation, application, control, ordering and production.

It is also a way to integrate the hardware in the data model of the element and hence be part of integrated checks.

The VHS building hardware standard is not meant for the production of the hardware itself, or as a classification standard.

Having a standardized format for all the hardware in and on windows and doors and their frames means much less work for all the parties involved: the hardware manufacturers, the suppliers, the door and window manufacturers and, in the end, facility management (the user).

Having an abundance of all kinds of native and system-bound formats is no longer needed.

3 The standard

The standard exists of 3 main parts which, together, form a protocol for digital hardware application:

- Part 1 **Articles** with properties (price, color, order number, etc.) and with geometric 3D data (shapes, operations)
- Part 2 **Recipes** with conditions and locations to place the articles in and around a window or door or the frame itself.
- Part 3 **Placeholder options** to let the user choose properties like for instance color or PC size.

For the data format is chosen for the XML format, an accessible text file format for standardized data.

For the geometry format of the 'FixedPart' is chosen for the Bos protocol (BMH XML Modelling protocol for construction frames) of Bos Machines. And the addition to 'FixedPartArticle' and the recipe structure in the WHS (Windowframe Hardware Standard) of DeltaPi Systems.

Both are based on a 3D datamodel fit for production and usable in a BIM environment.

The geometry definition is based on schematized shapes and avoidance of an overload of non-relevant 3D data. The resulting model covers the calculation, modelling, ordering and production. All the data for this can be based on simple shapes and accurate operations (the needed holes en pockets).

This makes it possible to keep the building hardware data compact and fast in BIM models. Which is very important for acceptance in the BIM world.

4 The parts:

Part 1 Article; the article (e.g. hinge) with shapes, drillholes and pockets:

Name

Atlas INSIDE Renovatie 4.0/89X89 tek: 20150025.1042R_L

Description

Atlas Inside RENO gelagerd SKG**® compleet

Hardware article type

Hinge

Manufacturer

BUVA

Manufacturer article ID

1342166V

Only on current frame

☐

Is exclusive

☐

Operations

Type	Description	Usage	Offset	Depth	Diameter	Taper	AngleX	AngleY
Shape	Shape	General	0,00	-102,00			-90,00	0,00
Shape	Shape	General	-6,50	-89,00			-90,00	0,00
Shape	Shape	General	-6,50	-89,00			-90,00	0,00
Pocket	Pocket	General	2,60	3,00			0,00	-90,00
Pocket	Pocket	General	0,00	-3,00			0,00	-90,00
Drillhole	Drillhole	General	-3,00	-5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	-3,00	-5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	5,60	5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	5,60	5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	5,60	5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	5,60	5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	-3,00	-5,00	2,50		0,00	-90,00
Drillhole	Drillhole	General	-3,00	-5,00	2,50		0,00	-90,00

Figure 1

Part 2 Recipe; the placement of the article in the 3D data model of the frame:

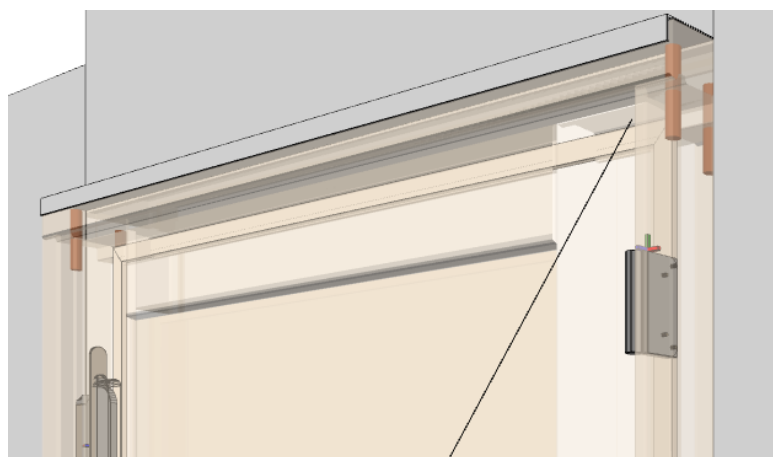


Figure 2

Part 3 Options; the choice of a possible option on an applied article:

Figure 3

5 The data cluster

The article, recipe, and options together are a cluster.

A certain building hardware type (e.g. a series tilt- and turn window) comprises of articles, their basic data, their geometry and operations, the recipes with the placements and cut length, and the possible options.

This information consists of several files, but it is 1 coherent cluster for that series.

Each building hardware type series is a cluster of coherent data. Clusters can reference articles in other clusters to avoid redundancy.

6 Optimal workflow

The digital basic data (the cluster) of the articles, their placement and possible options is created by the building hardware manufacturer. The manufacturer, or its representative, is responsible for the actuality.

The articles in this cluster are given an addition by the supplier with supplier-dependent data: price, discount, packing unit, order number, etc. Also the supplier can manipulate and edit the recipes, dependent on the assortment of the supplier. The supplier is responsible for the actuality of this cluster.

This cluster is handed to the door or window manufacturer by the supplier. The door or window manufacturer can edit the articles, recipes and options, dependent on its production preferences.

The final cluster is used in the datamodel of the frames and guarantees the correct placement, operations and price.

7 Distribution

Providing and distribution of the data is mainly done by the supplier: he wants to keep control over the prices, brands and assortment, and wants to keep a firm link with his customers. Which perfectly can be done with this standard and workflow.

Setting up a distinct distribution channel for digital building hardware data for the door and window manufacturer (and ditto costs) seems unnecessary.

8 Presentation

A small movie to show the principle of articles and recipes:

[VHS building hardware \(BIM\) standard principle](#)

9 Documents

- VHS building hardware (BIM) standard - Introduction (this document)
- VHS building hardware (BIM) standard – Part 1 Article definition: a description of the Article format
- VHS building hardware (BIM) standard – Part 2 Recipe definition: a description of the Recipe format
- VHS building hardware (BIM) standard – Part 3 Placeholder options: a description of the Placeholder format for applying options.
- VHS building hardware (BIM) standard - XML Schema Article: an XSD technical description of the Article format
- VHS building hardware (BIM) standard - XML Schema Recipe: an XSD technical description of the Recipe format

10 Limitations

This standard defines a format and describes a possible workflow.

Providing instruments and software for it is not up to the Dutch Building Hardware Association VHS, but for the members, participants and software houses.

This standard does neither include a classification or naming convention.

11 Creation of the data

There are 3 possibilities for this:

- Direct generation of the XML data from the production database. The XML structure is relatively simple and can automatically be generated.
- Buying tools from a participating software company to create the data with these tools.
- Creation of the data by a third-party.

12 Participants alphabetically

- DeltaPi Systems
- Maco Beschlge
- Matrix Software
- Rubysoft
- Dutch Building Hardware Association VHS