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## Introduction

Founded in 1989, C.A.T.S. Software GmbH is a German company with its headquarters in Darmstadt. C.A.T.S. Software is a pioneer when it comes to CAD applications for MEP. The product portfolio consists of the complete range of MEP trades, i.e. HVAC, Plumbing, Sprinkler, and Electro, including their respective integrated calculations. The applications are tried and tested, easy to use, and fully featured. More than 5000 licenses are in use by planners, engineers, and contractors.

C.A.T.S. Software is IFC2x3 CV2.0 MEP Export Certified from C.A.T.S. version R2023.1 onwards. The complete IFC functionality is part of the C.A.T.S. software BIM package, which also consists of a powerful BIM Viewer.

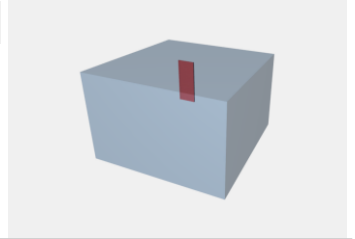
Intelligent IFC Import supports a selection of object groups (including IFC property sets), individual building storeys and placing of storeys in X-, Y- or Z-direction. Imported components (with technical data) will automatically be added to C.A.T.S. Navigator database for the further use of integrated heat- and cooling load calculations.

## Testlist

Name test	concepts total	manually checked		
				
CharsetTest-01MEP / 2x3	2	2		
DuplexHouse_Electrical / 2x3	65	49		16
DuplexHouse_Heating / 2x3	56	30		26
DuplexHouse_Sanitary / 2x3	52	41		11
DuplexHouse_Ventilation / 2x3	44	35		9
StairSlab-01 / 2x3	19	14		5
UnitTest-01MEP / 2x3	3	3		
WallStandardCase 01S / 2x3	15	8	1	6
Window 01 / 2x3	22	13		9

## Concepts

### CharsetTest-01MEP / 2x3



General	<i>company statement</i>	<i>CharsetTest-01MEP / 2x3</i>
_G1 Character sets	■	
_G4 Remarks	■	














## DuplexHouse\_Electrical / 2x3



204 IfcEnergyConversionDevice		<i>company statement</i>	<i>DuplexHouse_Electrical / 2x3</i>
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
030 Geometry			
030-6 Geometry Body			
030-6-5 Geometry Explicit	■		
030-6-9 Geometry Mapped	■		
100 Element Aggregation			
100-4 Port Assignment	■		
110 Connectivity			
110-5 Connectivity by Ports	■		
120 Spatial Containment	■		
130 Grouping			
130-2 Grouping to Systems	■		
300 Type			
300-1 Type Geometry	■		
300-2 Type Naming	■		
205 IfcFlowController		<i>company statement</i>	<i>DuplexHouse_Electrical / 2x3</i>
010 Naming	■		

020 Placement		
020-2 Placement Relative		
030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		
120 Spatial Containment		
130 Grouping		
130-2 Grouping to Systems		
300 Type		
300-1 Type Geometry		
300-2 Type Naming		
206 IfcFlowFitting		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Electrical / 2x3</i></span>
010 Naming		
020 Placement		
020-2 Placement Relative		
030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		

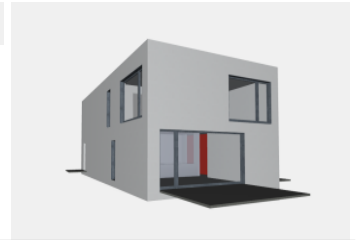
100 Element Aggregation	
100-4 Port Assignment	■
110 Connectivity	
110-5 Connectivity by Ports	■
120 Spatial Containment	■
130 Grouping	
130-2 Grouping to Systems	■
300 Type	
300-1 Type Geometry	■
300-2 Type Naming	■
208 IfcFlowSegment	<i>company statement</i>
	<i>DuplexHouse_Electrical / 2x3</i>
010 Naming	■
020 Placement	
020-2 Placement Relative	■
030 Geometry	
030-6 Geometry Body	
030-6-5 Geometry Explicit	■
030-6-9 Geometry Mapped	■
040 Presentation	
040-1 Geometric Presentation	■
100 Element Aggregation	
100-4 Port Assignment	■
110 Connectivity	
110-5 Connectivity by Ports	■
120 Spatial Containment	■

130 Grouping		
130-2 Grouping to Systems		
300 Type		
300-1 Type Geometry		
300-2 Type Naming		
210 IfcFlowTerminal		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Electrical / 2x3</i></span>
010 Naming		
020 Placement		
020-2 Placement Relative		
030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		
040 Presentation		
040-1 Geometric Presentation		
050 CAD Layer		We use our own CAD layer management.
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		
120 Spatial Containment		
130 Grouping		
130-2 Grouping to Systems		

210 Property Set			
210-1 Property Set IFC Common		■	
210-6 Property Set IFC any		■	
210-9 Property Set User Defined		■	
300 Type			
300-1 Type Geometry		■	
300-2 Type Naming		■	
501 IfcProject			<i>company statement</i> DuplexHouse_Electrical / 2x3
010 Naming		■	
503 IfcBuilding			<i>company statement</i> DuplexHouse_Electrical / 2x3
010 Naming		■	
504 IfcBuildingStorey			<i>company statement</i> DuplexHouse_Electrical / 2x3
010 Naming		■	
020 Placement			
020-2 Placement Relative		■	
150 Spatial Aggregation			
150-1 Spatial Composition		■	
507 IfcSystem			<i>company statement</i> DuplexHouse_Electrical / 2x3
010 Naming		■	
130 Grouping			
130-2 Grouping to Systems		■	
130-5 Is Group		■	
General			<i>company statement</i> DuplexHouse_Electrical / 2x3
_G4 Remarks		■	






## DuplexHouse\_Heating / 2x3



204 IfcEnergyConversionDevice	<i>company statement</i>	<i>DuplexHouse_Heating / 2x3</i>
010 Naming	■	
030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit	■	
030-6-9 Geometry Mapped	■	
040 Presentation		
040-1 Geometric Presentation	■	
100 Element Aggregation		
100-4 Port Assignment	■	
110 Connectivity		
110-5 Connectivity by Ports	■	
130 Grouping		
130-2 Grouping to Systems	■	
300 Type		
300-1 Type Geometry	■	
300-5 Type Property Set	■	
205 IfcFlowController	<i>company statement</i>	<i>DuplexHouse_Heating / 2x3</i>
010 Naming	■	

030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		
040 Presentation		
040-1 Geometric Presentation		
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		
130 Grouping		
130-2 Grouping to Systems		
300 Type		
300-1 Type Geometry		
300-5 Type Property Set		
206 IfcFlowFitting		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Heating / 2x3</i></span>
010 Naming		
030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		
040 Presentation		
040-1 Geometric Presentation		
100 Element Aggregation		
100-4 Port Assignment		

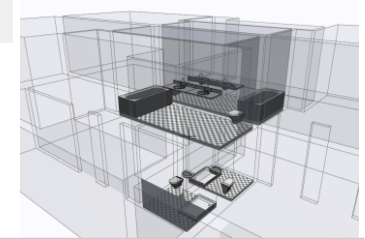
110 Connectivity			
110-5 Connectivity by Ports		■	
130 Grouping			
130-2 Grouping to Systems		■	
300 Type			
300-1 Type Geometry		■	
300-5 Type Property Set		■	
207 IfcFlowMovingDevice			<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Heating / 2x3</i></span>
010 Naming		■	
030 Geometry			
030-6 Geometry Body			
030-6-5 Geometry Explicit		■	
030-6-9 Geometry Mapped		■	
040 Presentation			
040-1 Geometric Presentation		■	
100 Element Aggregation			
100-4 Port Assignment		■	
110 Connectivity			
110-5 Connectivity by Ports		■	
130 Grouping			
130-2 Grouping to Systems		■	
300 Type			
300-1 Type Geometry		■	
300-5 Type Property Set		■	
208 IfcFlowSegment			<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Heating / 2x3</i></span>

010 Naming	
030 Geometry	
030-6 Geometry Body	
030-6-1 Geometry SweptSolid	
030-6-5 Geometry Explicit	
030-6-9 Geometry Mapped	
040 Presentation	
040-1 Geometric Presentation	
100 Element Aggregation	
100-4 Port Assignment	
110 Connectivity	
110-5 Connectivity by Ports	
130 Grouping	
130-2 Grouping to Systems	
300 Type	
300-1 Type Geometry	
300-5 Type Property Set	
210 IfcFlowTerminal	<i>company statement</i>
010 Naming	
030 Geometry	
030-6 Geometry Body	
030-6-5 Geometry Explicit	
030-6-9 Geometry Mapped	
040 Presentation	
040-1 Geometric Presentation	

*DuplexHouse\_Heating / 2x3*

100 Element Aggregation			
100-4 Port Assignment		■	
110 Connectivity			
110-5 Connectivity by Ports		■	
130 Grouping			
130-2 Grouping to Systems		■	
300 Type			
300-1 Type Geometry		■	
300-5 Type Property Set		■	
General	<i>company statement</i>		<i>DuplexHouse_Heating / 2x3</i>
_G4 Remarks		■	









## DuplexHouse\_Sanitary / 2x3



205 IfcFlowController	<i>company statement</i>	<i>DuplexHouse_Sanitary / 2x3</i>
010 Naming	■	
020 Placement 020-2 Placement Relative	■	
030 Geometry 030-6 Geometry Body 030-6-1 Geometry SweptSolid 030-6-5 Geometry Explicit 030-6-9 Geometry Mapped	■ ■ ■ ■	
040 Presentation 040-1 Geometric Presentation	■	
100 Element Aggregation 100-4 Port Assignment	■	
110 Connectivity 110-5 Connectivity by Ports	■	
120 Spatial Containment	■	
130 Grouping 130-2 Grouping to Systems	■	
206 IfcFlowFitting	<i>company statement</i>	<i>DuplexHouse_Sanitary / 2x3</i>
010 Naming	■	

020 Placement	
020-2 Placement Relative	■
030 Geometry	
030-6 Geometry Body	
030-6-1 Geometry SweptSolid	■
030-6-5 Geometry Explicit	■
030-6-9 Geometry Mapped	■
040 Presentation	
040-1 Geometric Presentation	■
100 Element Aggregation	
100-4 Port Assignment	■
110 Connectivity	
110-5 Connectivity by Ports	■
120 Spatial Containment	■
130 Grouping	
130-2 Grouping to Systems	■
208 IfcFlowSegment	<i>company statement</i>
010 Naming	■
020 Placement	
020-2 Placement Relative	■
030 Geometry	
030-6 Geometry Body	
030-6-1 Geometry SweptSolid	■
030-6-5 Geometry Explicit	■
030-6-9 Geometry Mapped	■

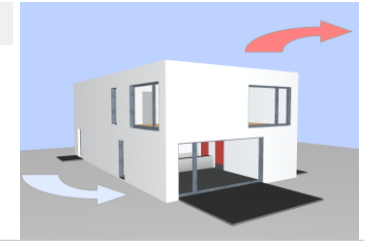
*DuplexHouse\_Sanitary / 2x3*

040 Presentation		
040-1 Geometric Presentation		
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		
120 Spatial Containment		
130 Grouping		
130-2 Grouping to Systems		
210 IfcFlowTerminal		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Sanitary / 2x3</i></span>
010 Naming		
020 Placement		
020-2 Placement Relative		
030 Geometry		
030-6 Geometry Body		
030-6-1 Geometry SweptSolid		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		
040 Presentation		
040-1 Geometric Presentation		
050 CAD Layer		We use our own CAD layer management.
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		








120 Spatial Containment		
130 Grouping		
130-2 Grouping to Systems		
200 Material		
200-1 Single Material		
210 Property Set		
210-6 Property Set IFC any		
210-9 Property Set User Defined		
300 Type		
300-1 Type Geometry		
300-2 Type Naming		
300-3 Type Material		
300-5 Type Property Set		
507 IfcSystem		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Sanitary / 2x3</i></span>
010 Naming		
130 Grouping		
130-5 Is Group		
250 System Assignment		
250-2 Services Spatial Element		
General		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Sanitary / 2x3</i></span>
_G4 Remarks		

## DuplexHouse\_Ventilation / 2x3



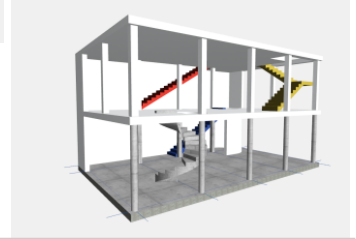
206 IfcFlowFitting		<i>company statement</i>	<i>DuplexHouse_Ventilation / 2x3</i>
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
030 Geometry			
030-6 Geometry Body			
030-6-1 Geometry SweptSolid	■		
030-6-5 Geometry Explicit	■		
030-6-9 Geometry Mapped	■		
040 Presentation			
040-1 Geometric Presentation	■		
100 Element Aggregation			
100-4 Port Assignment	■		
110 Connectivity			
110-5 Connectivity by Ports	■		
120 Spatial Containment	■		
130 Grouping			
130-2 Grouping to Systems	■		
207 IfcFlowMovingDevice		<i>company statement</i>	<i>DuplexHouse_Ventilation / 2x3</i>
010 Naming	■		

020 Placement	
020-2 Placement Relative	■
030 Geometry	
030-6 Geometry Body	
030-6-1 Geometry SweptSolid	■
030-6-5 Geometry Explicit	■
030-6-9 Geometry Mapped	■
040 Presentation	
040-1 Geometric Presentation	■
100 Element Aggregation	
100-4 Port Assignment	■
110 Connectivity	
110-5 Connectivity by Ports	■
120 Spatial Containment	■
130 Grouping	
130-2 Grouping to Systems	■
208 IfcFlowSegment	<i>company statement</i>
	<i>DuplexHouse_Ventilation / 2x3</i>
010 Naming	■
020 Placement	
020-2 Placement Relative	■
030 Geometry	
030-6 Geometry Body	
030-6-1 Geometry SweptSolid	■
030-6-5 Geometry Explicit	■
030-6-9 Geometry Mapped	■

040 Presentation		
040-1 Geometric Presentation		
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		
120 Spatial Containment		
130 Grouping		
130-2 Grouping to Systems		
210 IfcFlowTerminal		<i>company statement</i> <span style="float: right;"><i>DuplexHouse_Ventilation / 2x3</i></span>
010 Naming		
020 Placement		
020-2 Placement Relative		
030 Geometry		
030-6 Geometry Body		
030-6-1 Geometry SweptSolid		
030-6-5 Geometry Explicit		
030-6-9 Geometry Mapped		
040 Presentation		
040-1 Geometric Presentation		
100 Element Aggregation		
100-4 Port Assignment		
110 Connectivity		
110-5 Connectivity by Ports		
120 Spatial Containment		

130 Grouping			
130-2 Grouping to Systems			
507 IfcSystem		<i>company statement</i>	<i>DuplexHouse_Ventilation / 2x3</i>
010 Naming			
130 Grouping			
130-5 Is Group			
250 System Assignment			
250-2 Services Spatial Element			
General		<i>company statement</i>	<i>DuplexHouse_Ventilation / 2x3</i>
_G4 Remarks			

**StairSlab-01 / 2x3**

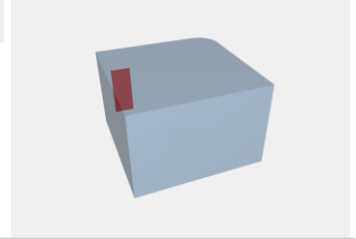


105 IfcSlab	<i>company statement</i>		<i>StairSlab-01 / 2x3</i>
001 GUIDs	■		
002 History	■		
030 Geometry			
030-6 Geometry Body			
030-6-1 Geometry SweptSolid	■		
040 Presentation			
040-1 Geometric Presentation	■		
040-2 Material Presentation	■		
070 Voiding			
070-3 Voiding Geometry SweptSolid	■		
106 IfcStair	<i>company statement</i>		<i>StairSlab-01 / 2x3</i>
001 GUIDs	■		
002 History	■		
010 Naming	■		
020 Placement			
020-1 Placement Relative	■		

030 Geometry		
030-6 Geometry Body		
030-6-5 Geometry Explicit	■	
030-9 Geometry By Components	■	
040 Presentation		
040-1 Geometric Presentation	■	
050 CAD Layer	■	We use our own CAD layer management.
100 Element Aggregation		
100-2 Element Decomposition	■	
120 Spatial Containment	■	
200 Material		
200-1 Single Material	■	
210 Property Set		
210-1 Property Set IFC Common	■	
General		<i>company statement</i>
_G4 Remarks	■	

StairSlab-01 / 2x3

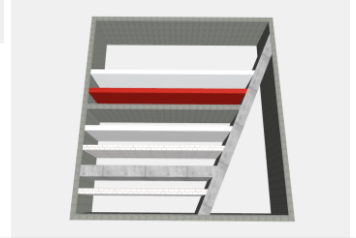
## UnitTest-01MEP / 2x3



501 IfcProject	<i>company statement</i>	<i>UnitTest-01MEP / 2x3</i>
005 Project Units		
005-1 Project Metric Units	■	
005-2 Project Imperial Units	■	
General	<i>company statement</i>	<i>UnitTest-01MEP / 2x3</i>
_G4 Remarks	■	



## WallStandardCase 01S / 2x3



101 IfcWallStandardCase	<i>company statement</i>		<i>WallStandardCase 01S / 2x3</i>
010 Naming	■		
020 Placement 020-2 Placement Relative	■		
030 Geometry 030-2 Geometry Axis 030-6 Geometry Body 030-6-1 Geometry SweptSolid 030-6-2 Geometry Clipping	■	Geometry axis supported, but explicitly displayed.	
040 Presentation 040-1 Geometric Presentation 040-2 Material Presentation	■		
050 CAD Layer	■	We use our own CAD layer management.	
110 Connectivity 110-2 Connectivity Path	■		
120 Spatial Containment	■		
200 Material 200-4 Material Layer Usage	■		
210 Property Set 210-3 Property Set User Defined	■		

300 Type		
300-3 Type Material	■	
300-5 Type Property Set	■	
General		<i>company statement</i> <span style="float: right;"><i>WallStandardCase 01S / 2x3</i></span>
_G4 Remarks	■	

Window 01 / 2x3



301 IfcWindow	<i>company statement</i>		<i>Window 01 / 2x3</i>
001 GUIDs	■		
002 History	■		
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
030 Geometry			
030-5 Geometry Profile	■		
030-6 Geometry Body			
030-6-5 Geometry Explicit	■		
030-6-9 Geometry Mapped	■		
040 Presentation			
040-1 Geometric Presentation	■		
050 CAD Layer	■	We use our own CAD layer management.	
080 Filling			
080-2 Is Filling	■		
120 Spatial Containment	■		
200 Material			
200-1 Single Material	■		
200-5 Material List	■		

210 Property Set		
210-1 Property Set IFC Common		
210-2 Property Set IFC any		
210-3 Property Set User Defined		
300 Type		
300-1 Type Geometry		
300-2 Type Naming		
300-3 Type Material		
300-5 Type Property Set		
300-6 Type Predefined Properties		
300-6-1 Type Predefined Properties Window		
General		<i>company statement</i>
_G4 Remarks		

Window 01 / 2x3