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Introduction

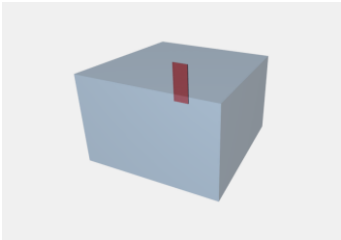
AVEVA E3D Design is an advanced 3D design solution for the process plant, marine and power industries. It enables powerful visualization, clash-free, multi-discipline 3D design, and rapidly generates accurate drawings and reports to reduce costs, timescales and commercial risks of both greenfield and brownfield capital projects. IFC Export was introduced in the 2.1 series, and improvements have been made in the 3.1 series. 3.1.6 includes a number of corrections and improvements for IFC certification. The files submitted for certification include a number of further improvements to be released in AVEVA E3D Design 4 and 3.1.7
<https://www.aveva.com/en/products/e3d-design/>

Testlist

Name test	concepts total	manually checked		
				
CharsetTest-01MEP / 2x3	2	2		
DuplexHouse_Electrical / 2x3	65	29	3	33
DuplexHouse_Heating / 2x3	56	19	1	36
DuplexHouse_Sanitary / 2x3	52	23	1	28
DuplexHouse_Ventilation / 2x3	44	21		23
RandomMEP-X1 / 2x3	3	1	2	
RandomMEP-X2 / 2x3	10	10		
RandomMEP-X3 / 2x3	3	3		
RandomMEP-X4 / 2x3	25	16	9	
RandomMEP-X5 / 2x3	6	4	2	
Space_01MEP / 2x3	15	12	2	1
UnitTest-01MEP / 2x3	3	1	1	1

Concepts

CharsetTest-01MEP / 2x3



General	company statement		CharsetTest-01MEP / 2x3
_G1 Character sets		ok	
_G4 Remarks		ok	

DuplexHouse_Electrical / 2x3



204 IfcEnergyConversionDevice		company statement	DuplexHouse_Electrical / 2x3
010 Naming	Supported		
020 Placement			
020-2 Placement Relative	Supported		
030 Geometry			
030-6 Geometry Body			
030-6-5 Geometry Explicit	Supported		
030-6-9 Geometry Mapped	Not Supported	AVEVA E3D Design does not export mapped geometry	
100 Element Aggregation			
100-4 Port Assignment	Not Supported	AVEVA E3D Design does not export IFC Ports	
110 Connectivity			
110-5 Connectivity by Ports	Not Supported		
120 Spatial Containment	Supported		
130 Grouping			
130-2 Grouping to Systems	Not Supported	AVEVA E3D Design does not currently export IFC Systems	
300 Type			
300-1 Type Geometry	Not Supported	AVEVA E3D Design does not export IFC Type Objects	
300-2 Type Naming	Not Supported		
205 IfcFlowController		company statement	DuplexHouse_Electrical / 2x3
010 Naming	Supported		

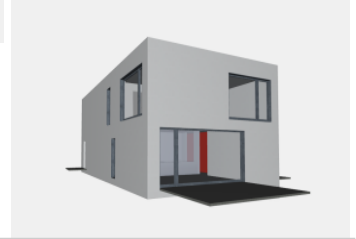
020 Placement	
020-2 Placement Relative	■
030 Geometry	
030-6 Geometry Body	
030-6-5 Geometry Explicit	■
030-6-9 Geometry Mapped	■
100 Element Aggregation	
100-4 Port Assignment	■
110 Connectivity	
110-5 Connectivity by Ports	■
120 Spatial Containment	■
130 Grouping	
130-2 Grouping to Systems	■
300 Type	
300-1 Type Geometry	■
300-2 Type Naming	■
206 IfcFlowFitting	<i>company statement</i>
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	Not Supported
110 Connectivity	
110-5 Connectivity by Ports	Not Supported
120 Spatial Containment	Supported
130 Grouping	
130-2 Grouping to Systems	Not Supported
300 Type	
300-1 Type Geometry	Not Supported
300-2 Type Naming	Not Supported
208 IfcFlowSegment	company statement DuplexHouse_Electrical / 2x3
010 Naming	Supported
020 Placement	
020-2 Placement Relative	Supported
030 Geometry	
030-6 Geometry Body	
030-6-5 Geometry Explicit	Supported
030-6-9 Geometry Mapped	Not Supported
040 Presentation	
040-1 Geometric Presentation	Supported
100 Element Aggregation	
100-4 Port Assignment	Not Supported
110 Connectivity	
110-5 Connectivity by Ports	Not Supported
120 Spatial Containment	Supported

130 Grouping	
130-2 Grouping to Systems	■
300 Type	
300-1 Type Geometry	■
300-2 Type Naming	■
210 IfcFlowTerminal	<i>company statement</i> DuplexHouse_Electrical / 2x3
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	■
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		AVEVA E3D Design can export most standard property sets. Not all Property Types required by other standard property sets are currently supported.
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		AVEVA E3D Design uses fixed Name/LongName for the IFC Project
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	company statement		DuplexHouse_Heating / 2x3
010 Naming	■		
030 Geometry			
030-6 Geometry Body			
030-6-5 Geometry Explicit	■		
030-6-9 Geometry Mapped	■	AVEVA E3D Design does not export mapped geometry	
040 Presentation			
040-1 Geometric Presentation	■		
100 Element Aggregation			
100-4 Port Assignment	■	AVEVA E3D Design does not export IFC Ports	
110 Connectivity			
110-5 Connectivity by Ports	■		
130 Grouping			
130-2 Grouping to Systems	■	AVEVA E3D Design does not currently export IFC Systems	
300 Type			
300-1 Type Geometry	■	AVEVA E3D Design does not export IFC Type Objects	
300-5 Type Property Set	■		
205 IfcFlowController	company statement		DuplexHouse_Heating / 2x3
010 Naming	■		

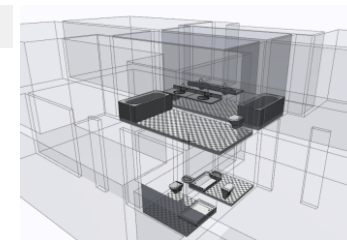
030 Geometry	
030-6 Geometry Body	
030-6-5 Geometry Explicit	Supported
030-6-9 Geometry Mapped	Not Supported
040 Presentation	
040-1 Geometric Presentation	Supported
100 Element Aggregation	
100-4 Port Assignment	Not Supported
110 Connectivity	
110-5 Connectivity by Ports	Not Supported
130 Grouping	
130-2 Grouping to Systems	Not Supported
300 Type	
300-1 Type Geometry	Not Supported
300-5 Type Property Set	Not Supported
206 IfcFlowFitting	company statement
010 Naming	Supported
030 Geometry	
030-6 Geometry Body	
030-6-5 Geometry Explicit	Supported
030-6-9 Geometry Mapped	Not Supported
040 Presentation	
040-1 Geometric Presentation	Supported
100 Element Aggregation	
100-4 Port Assignment	Not Supported

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	company statement DuplexHouse_Heating / 2x3	
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	company statement DuplexHouse_Heating / 2x3	

010 Naming		
030 Geometry		
030-6 Geometry Body		
030-6-1 Geometry SweptSolid		AVEVA E3D Design can export some geometry as swept solids, but for full compliance with IFC2x3 exports should be facets only
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	company statement DuplexHouse_Heating / 2x3	
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	■
General	company statementDuplexHouse_Heating / 2x3
_G4 Remarks	■

DuplexHouse_Sanitary / 2x3



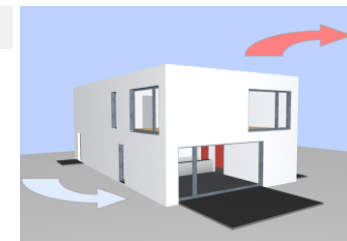
205 IfcFlowController	company statement		DuplexHouse_Sanitary / 2x3
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
030 Geometry			
030-6 Geometry Body			
030-6-1 Geometry SweptSolid	■	AVEVA E3D Design can export some geometry as swept solids, but for full compliance with IFC2x3 exports should be facets only	
030-6-5 Geometry Explicit	■		
030-6-9 Geometry Mapped	■	AVEVA E3D Design does not export mapped geometry	
040 Presentation			
040-1 Geometric Presentation	■		
100 Element Aggregation			
100-4 Port Assignment	■	AVEVA E3D Design does not export IFC Ports	
110 Connectivity			
110-5 Connectivity by Ports	■		
120 Spatial Containment	■		
130 Grouping			
130-2 Grouping to Systems	■	AVEVA E3D Design does not currently export IFC Systems	
206 IfcFlowFitting	company statement		DuplexHouse_Sanitary / 2x3
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	company statement DuplexHouse_Sanitary / 2x3
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> <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	■
050 CAD Layer	■
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		AVEVA E3D Design did not export IFC Materials for this test. Limited support has since been added.
210 Property Set		
210-6 Property Set IFC any		AVEVA E3D Design can export most standard property sets. Not all Property Types required by other standard property sets are currently supported.
210-9 Property Set User Defined		
300 Type		
300-1 Type Geometry		AVEVA E3D Design does not export IFC Type Objects
300-2 Type Naming		
300-3 Type Material		
300-5 Type Property Set		
507 IfcSystem		company statement DuplexHouse_Sanitary / 2x3
010 Naming		
130 Grouping		
130-5 Is Group		
250 System Assignment		
250-2 Services Spatial Element		
General		company statement DuplexHouse_Sanitary / 2x3
_G4 Remarks		

DuplexHouse_Ventilation / 2x3



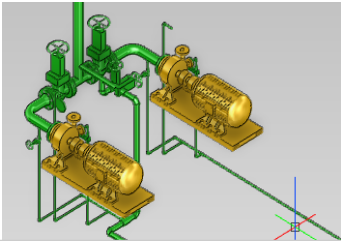
206 IfcFlowFitting		company statement	DuplexHouse_Ventilation / 2x3
010 Naming		■	
020 Placement			
020-2 Placement Relative		■	
030 Geometry			
030-6 Geometry Body			
030-6-1 Geometry SweptSolid		■ AVEVA E3D Design can export some geometry as swept solids, but for full compliance with IFC2x3 exports should be facets only	
030-6-5 Geometry Explicit		■	
030-6-9 Geometry Mapped		■ AVEVA E3D Design does not export mapped geometry	
040 Presentation			
040-1 Geometric Presentation		■	
100 Element Aggregation			
100-4 Port Assignment		■ AVEVA E3D Design does not export IFC Ports	
110 Connectivity			
110-5 Connectivity by Ports		■	
120 Spatial Containment		■	
130 Grouping			
130-2 Grouping to Systems		■ AVEVA E3D Design does not currently export IFC Systems	
207 IfcFlowMovingDevice		company statement	DuplexHouse_Ventilation / 2x3
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	company statement DuplexHouse_Ventilation / 2x3
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	■

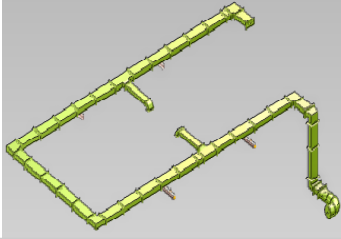
040 Presentation	
040-1 Geometric Presentation	■
100 Element Aggregation	
100-4 Port Assignment	■
110 Connectivity	
110-5 Connectivity by Ports	■
120 Spatial Containment	■
130 Grouping	
130-2 Grouping to Systems	■
210 IfcFlowTerminal	<i>company statement</i> <i>DuplexHouse_Ventilation / 2x3</i>
010 Naming	■
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	■	
507 IfcSystem		<i>company statement</i> DuplexHouse_Ventilation / 2x3
010 Naming	■	
130 Grouping		
130-5 Is Group	■	
250 System Assignment		
250-2 Services Spatial Element	■	
General		<i>company statement</i> DuplexHouse_Ventilation / 2x3
_G4 Remarks	■	

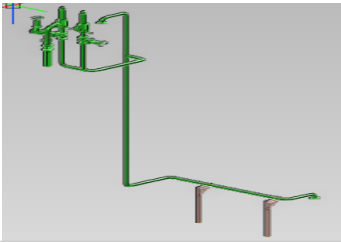
RandomMEP-X1 / 2x3



206 IfcFlowFitting	company statement		RandomMEP-X1 / 2x3
001 GUIDs	■	Unique GUIDs are exported for all IFC Elements requiring them. Not all AVEVA E3D Design database elements store the GUIDs persistently, and for these elements new GUIDS are generated at each export	
207 IfcFlowMovingDevice	company statement		RandomMEP-X1 / 2x3
208 IfcFlowSegment	company statement		RandomMEP-X1 / 2x3
001 GUIDs	■		
General	company statement		RandomMEP-X1 / 2x3
_G4 Remarks	■		

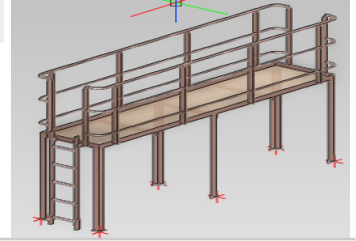
RandomMEP-X2 / 2x3			
204 IfcEnergyConversionDevice	company statement		RandomMEP-X2 / 2x3
001 GUIDs	■		
020 Placement			
020-2 Placement Relative	■		
407 IfcDiscreteAccessory	company statement		RandomMEP-X2 / 2x3
001 GUIDs	■	Unique GUIDs are exported for all IFC Elements requiring them. Not all AVEVA E3D Design database elements store the GUIDs persistently, and for these elements new GUIDS are generated at each export.	
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
408 IfcElementAssembly	company statement		RandomMEP-X2 / 2x3
001 GUIDs	■		
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
100 Element Aggregation			
100-2 Element Decomposition	■		
General	company statement		RandomMEP-X2 / 2x3
_G4 Remarks	■		

RandomMEP-X3 / 2x3



407 IfcDiscreteAccessory		company statement	RandomMEP-X3 / 2x3
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
General		company statement	RandomMEP-X3 / 2x3
_G4 Remarks	■		

RandomMEP-X4 / 2x3



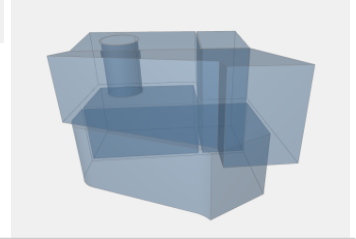
103 IfcBeam		company statement	RandomMEP-X4 / 2x3
001 GUIDs	■	Unique GUIDs are exported for all IFC Elements requiring them. Not all AVEVA E3D Design database elements store the GUIDs persistently, and for these elements new GUIDS are generated at each export.	
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
050 CAD Layer	■		
200 Material			
200-1 Single Material	■	AVEVA E3D Design has limited support for single materials (but not material properties etc)	
105 IfcSlab		company statement	RandomMEP-X4 / 2x3
001 GUIDs	■		
010 Naming	■		
020 Placement			
020-2 Placement Relative	■		
050 CAD Layer	■		
200 Material			
200-1 Single Material	■		
106 IfcStair		company statement	RandomMEP-X4 / 2x3
010 Naming	■		

020 Placement		
020-1 Placement Relative	■	
050 CAD Layer	■	
200 Material		
200-1 Single Material	■	
108 IfcRailing		company statement RandomMEP-X4 / 2x3
001 GUIDs	■	
010 Naming	■	
020 Placement		
020-2 Placement Relative	■	
050 CAD Layer	■	
200 Material		
200-1 Single Material	■	
406 IfcMechanicalFastener		company statement RandomMEP-X4 / 2x3
001 GUIDs	■	
010 Naming	■	
020 Placement		
020-2 Placement Relative	■	
050 CAD Layer	■	
200 Material		
200-1 Single Material	■	
General		company statement RandomMEP-X4 / 2x3
_G4 Remarks	■	

RandomMEP-X5 / 2x3

402 IfcPlate	company statement		RandomMEP-X5 / 2x3
001 GUIDs		Unique GUIDs are exported for all IFC Elements requiring them. Not all AVEVA E3D Design database elements store the GUIDs persistently, and for these elements new GUIDS are generated at each export.	
010 Naming			
020 Placement			
020-2 Placement Relative			
050 CAD Layer			
200 Material			
200-1 Single Material		AVEVA E3D Design Limited has limited support for single materials (but not material properties etc)	
General	company statement		RandomMEP-X5 / 2x3
_G4 Remarks			

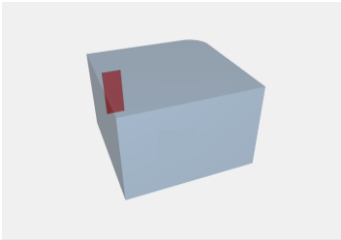
Space_01MEP / 2x3



111 IfcBuildingElementProxy		company statement	Space_01MEP / 2x3
010 Naming		■	
020 Placement			
020-2 Placement Relative		■	
030 Geometry			
030-6 Geometry Body			
030-6-1 Geometry SweptSolid		■ AVEVA E3D Design can export some geometry as swept solids, but for full compliance with IFC2x3 exports should be facets only	
210 Property Set			
210-2 Property Set IFC any		■	
505 IfcSpace		company statement	Space_01MEP / 2x3
001 GUIDs		■	
002 History		■	
010 Naming		■	
020 Placement			
020-2 Placement Relative		■	
030 Geometry			
030-6 Geometry Body			
030-6-1 Geometry SweptSolid		■	
030-6-2 Geometry Clipping		■ AVEVA E3D Design exports clipped geometry as facets.	

040 Presentation	
040-1 Geometric Presentation	■
050 CAD Layer	■
150 Spatial Aggregation	
150-1 Spatial Composition	■
210 Property Set	
210-6 Property Set IFC any	■
General	company statement
Space_01MEP / 2x3	
_G4 Remarks	■

UnitTest-01MEP / 2x3



501 IfcProject	company statement		UnitTest-01MEP / 2x3
005 Project Units			
005-1 Project Metric Units		AVEVA E3D Design always exports IFC files with metric project units.	
005-2 Project Imperial Units		AVEVA E3D Design does not use Imperial units in exported IFC files: they are converted to metric.	
General	company statement		UnitTest-01MEP / 2x3
_G4 Remarks			