

EUROMAP 92.1	OPC UA interfaces for plastics and rubber machinery - Flexible PUR foam - Cutting Machines
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EUROMAP 92.1 (Release Candidate RC 1.0.0) is identical with OPC 40092-1 (Release Candidate RC 1.0.0) and VDMA 40092-1:2025-09

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Forewords

OPC UA is a machine to machine communication technology to transmit characteristics of products (e.g. manufacturer name, device type or components) and process data (e.g. temperatures, pressures or feed rates). To enable vendor unspecific interoperability the description of product characteristics and process data has to be standardized utilizing technical specifications, the OPC UA companion specifications.

This specification was created by a joint working group of the OPC Foundation and EUROMAP. It is adopted identically as VDMA Specification.

EUROMAP

EUROMAP is the European umbrella association of the plastics and rubber machinery industry which accounts for annual sales of around 13.5 billion euro and a 40 per cent share of worldwide production. Almost 75 per cent of its European output is shipped to worldwide destinations. With global exports of 10.0 billion euro, EUROMAP's around 1,000 machinery manufacturers are market leaders with nearly half of all machines sold being supplied by EUROMAP members.

EUROMAP provides technical recommendations for plastics and rubber machines. In addition to standards for machine descriptions, dimensions and energy measurement, interfaces between machines feature prominently. The provision of manufacturer independent interfaces ensures high levels of machine compatibility.

OPC Foundation

OPC is the interoperability standard for the secure and reliable exchange of data and information in the industrial automation space and in other industries. It is platform independent and ensures the seamless flow of information among devices from multiple vendors. The OPC Foundation is responsible for the development and maintenance of this standard.

OPC UA is a platform independent service-oriented architecture that integrates all the functionality of the individual OPC Classic specifications into one extensible framework. This multi-layered approach accomplishes the original design specification goals of:

- Platform independence: from an embedded microcontroller to cloud-based infrastructure
- Secure: encryption, authentication, authorization and auditing
- Extensible: ability to add new features including transports without affecting existing applications
- Comprehensive information modelling capabilities: for defining any model from simple to complex

1 Scope

This specification is part of the specification series OPC 40092 for flexible PUR foam production and processing.

Polyurethane (PUR) foam is a synthetic polymer produced by the chemical reaction of polyols and isocyanates. It is widely used in flexible applications such as cushioning, insulation, and packaging due to its open-cell structure, elasticity, and durability.

This part covers the foam cutting machines.

OPC 40092-1 describes the data model for flexible PUR foam cutting machines for data exchange during operation. The target of OPC 40092-1 is to provide a unique interface for machines from different manufacturers to ensure compatibility.

The following functionalities are covered:

- General information about the machine (manufacturer, model, serial number...), current configuration and status.
- Process information like cutting knife speed for monitoring and process optimization.

Following functions are not included:

- Remote control of the machine
- Safety related signals like emergency stop

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments and errata) applies

OPC 10000-1, *OPC Unified Architecture - Part 1: Overview and Concepts*

<http://www.opcfoundation.org/UA/Part1/>

OPC 10000-3, *OPC Unified Architecture - Part 3: Address Space Model*

<http://www.opcfoundation.org/UA/Part3/>

OPC 10000-5, *OPC Unified Architecture - Part 5: Information Model*

<http://www.opcfoundation.org/UA/Part5/>

OPC 10000-6, *OPC Unified Architecture - Part 6: Mappings*

<http://www.opcfoundation.org/UA/Part6/>

OPC 10000-7, *OPC Unified Architecture - Part 7: Profiles*

<http://www.opcfoundation.org/UA/Part7/>

OPC 10000-8, *OPC Unified Architecture - Part 8: Data Access*

<http://www.opcfoundation.org/UA/Part8/>

OPC 10000-16, *OPC Unified Architecture - Part 16: State Machines*

<http://www.opcfoundation.org/UA/Part16/>

OPC 10000-100, *OPC Unified Architecture - Part 100: Devices*

<http://www.opcfoundation.org/UA/Part100/>

OPC 40001-1, *OPC UA for Machinery - Part 1: Basic Building Blocks*

<http://www.opcfoundation.org/UA/Machinery/>

OPC 40083: *OPC UA interfaces for plastics and rubber machinery – General Type definitions*

<http://www.opcfoundation.org/UA/PlasticsRubber/GeneralTypes>

EN 14886: *Plastics and rubber machines - Bandknife cutting machines for block foams - Safety requirements*

3 Terms, definitions and conventions

3.1 Overview

It is assumed that basic concepts of OPC UA information modelling are understood in this specification. This specification will use these concepts to describe the OPC 40092-1 Information Model. For the purposes of this document, the terms and definitions given in the documents referenced in Clause 2 apply.

Note that OPC UA terms and terms defined in this specification are *italicized* in the specification.

3.2 Conventions used in this document

The conventions described in OPC 40083 apply.

3.3 Abbreviations

MES Manufacturing Execution System

IMM Injection Moulding Machine

PUR Polyurethane

4 General information to OPC UA interfaces for plastics and rubber machinery and OPC UA

For general information on OPC UA interfaces for plastics and rubber machinery and OPC UA see OPC 40083.

5 Use cases

The following functionalities are covered:

- General information about the machine (manufacturer, model, serial number...), current configuration and status
- Process information (cutting knife speed, temperatures, ...)
- Monitoring (Status, Errors)
- Maintenance information
- Information on the production cycle

6 OPC 40092-1 Information Model Overview

6.1 FoamCuttingMachineType definition

This OPC UA *ObjectType* is used for the root *Object* representing a foam cutting machine. It is formally defined in Table 1.

The instance(s) of *FoamCuttingMachineType* shall be located under the *Machines Object* of the Server (see OPC UA for Machinery).

NOTE: If the OPC UA server is implemented in the control of the machine so only one instance of *FoamCuttingMachineType* will be created. But it is also possible that one OPC UA server is connected to several machine controls as aggregating server. In this case several instances of the *FoamCuttingMachineType* will be created.

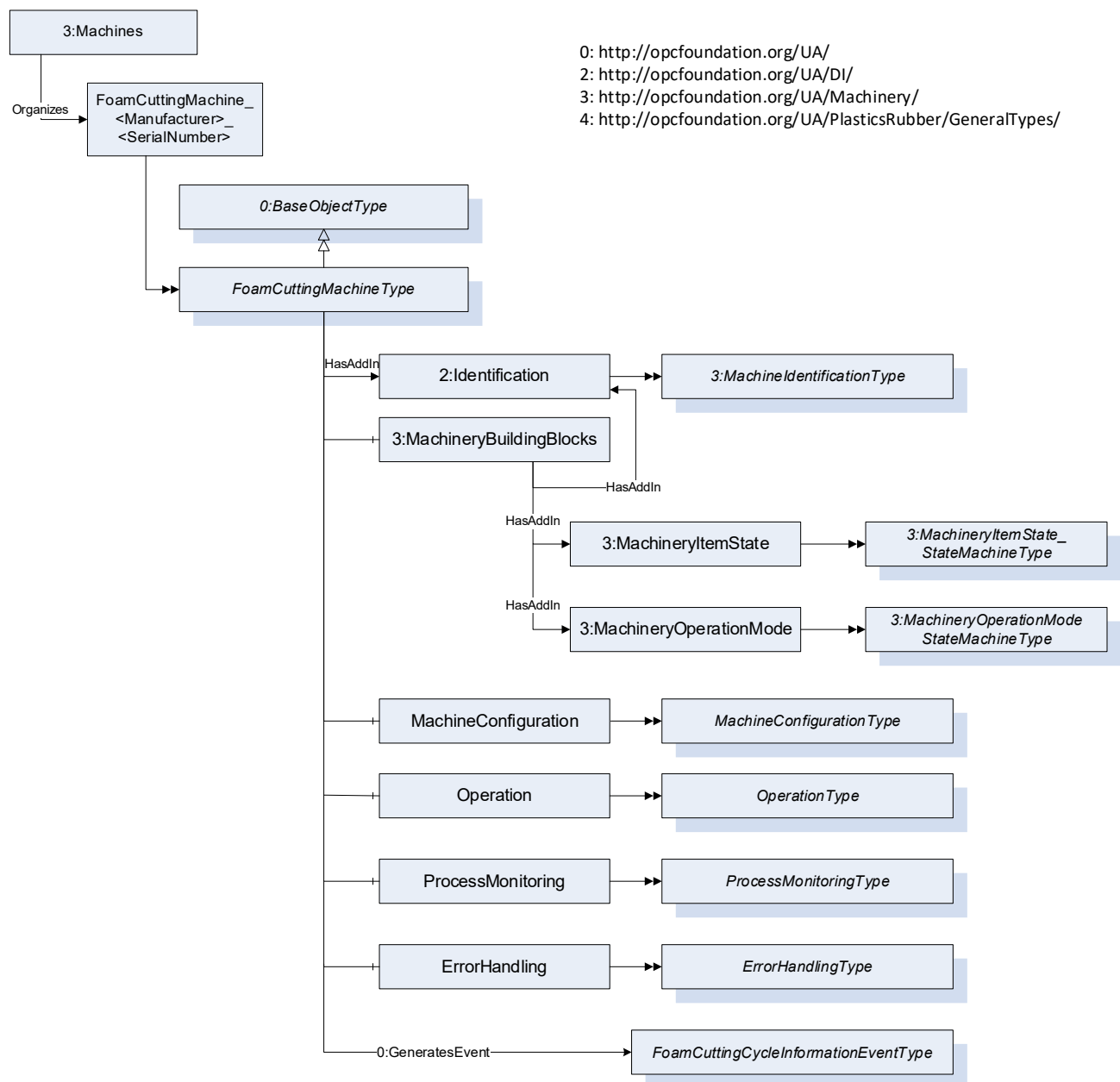


Figure 1 – FoamCuttingMachineType Overview

Table 1 – FoamCuttingMachineType definition

Attribute	Value				
BrowseName	FoamCuttingMachineType				
IsAbstract	False				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of 0:BaseObjectType defined in OPC 10000-5					
0:HasAddIn	Object	2:Identification		3:MachineIdentificationType	M
0:HasComponent	Object	3:MachineryBuildingBlocks		0:FolderType	M
0:HasComponent	Object	MachineConfiguration		MachineConfigurationType	M
0:HasComponent	Object	Operation		OperationType	M
0:HasComponent	Object	ProcessMonitoring		ProcessMonitoringType	M
0:HasComponent	Object	ErrorHandling		ErrorHandlingType	O
0:GeneratesEvent	Object Type	FoamCuttingCycleInformationEventType	Defined in chapter 14		
Conformance Units					
OPC 40092-1 Basic					
OPC 40092-1 ErrorHandling					
OPC 40092-1 FoamCuttingCycleInformationEvent					

6.2 Identification and MachineryBuildingBlocks

The *MachinelIdentificationType* is defined in OPC UA for Machinery (OPC 40001-1) and provides basic information on a machine/device.

For the *InstanceDeclaration* the *ModellingRules* of the *Properties Model*, *YearOfConstruction* and *DeviceClass* are overridden to mandatory.

The *Object MachineryBuildingBlocks* contains building blocks from OPC UA for Machinery as defined in OPC 40001-1. For this version of OPC 40092-1, the *Object* uses the two *AddIns MachineryItemState* and *MachineryOperationMode*.

Table 2 – FoamCuttingMachineType Additional Subcomponents

BrowsePath	References	NodeClasses	BrowseName	DataType	TypeDefinition	Other
2:Identification	0:HasProperty	Variable	2:Model	0:LocalizedText	0:PropertyType	M, RO
2:Identification	0:HasProperty	Variable	2:DeviceClass	0:String	0:PropertyType	M, RO
2:Identification	0:HasProperty	Variable	3:YearOfConstruction	0:UInt16	0:PropertyType	M, RO
3:MachineryBuildingBlocks	0:HasAddIn	Object	3:MachineryItemState		3:MachineryItemState_MachineType	M
3:MachineryBuildingBlocks	0:HasAddIn	Object	3:MachineryOperationMode		3:MachineryOperationMode_StateMachineType	M

The components of the *FoamCuttingMachineType* have additional references which are defined in Table 3.

Table 3 – FoamCuttingMachineType Additional References

SourceBrowsePath	Reference Type	Is Forward	TargetBrowsePath
3:MachineryBuildingBlocks	0:HasAddIn	True	2:Identification

The *DeviceClass Property* should have one of the values defined in EN 14886 if applicable:

- Automatic vertical bandknife cutting machine
- Manual vertical bandknife cutting machine
- Tilting bandknife cutting machine
- Bandknife cutting machine with turntable
- Vertical bandknife cutting machine with fixed table and movable cutting unit
- Automatic horizontal bandknife cutting machine

- Manual horizontal bandknife cutting machine
- Horizontal bandknife cutting machine for block trimming
- Vertical bandknife cutting machine for block trimming
- Contour cutting machine
- Profile cutting and splitting machine
- Compression cutting machine
- Peeling machine
- Cross-cutting machine

6.3 MachineConfiguration

Lists the current configuration of the foam cutting machine. The *MachineConfigurationType* is defined in chapter 7.

6.4 Operation

Provides *Objects* and *Variables* relevant for the operation of the machine. The *OperationType* is defined in chapter 12.

6.5 ProcessMonitoring

Provides the process values of the different components of the foam cutting machine. The *ProcessMonitoringType* is defined in chapter 10.1.

6.6 ErrorHandling

Provides *Objects* and *Methods* for simple error handling. The *ErrorHandlingType* is defined in chapter 13.

7 MachineConfigurationType

7.1 MachineConfigurationType definition

NodeType: ObjectType, Parent Node: FoamCuttingMachineType

The *MachineConfigurationType* lists the current configuration of the foam cutting machine. It is formally defined in Table 4.

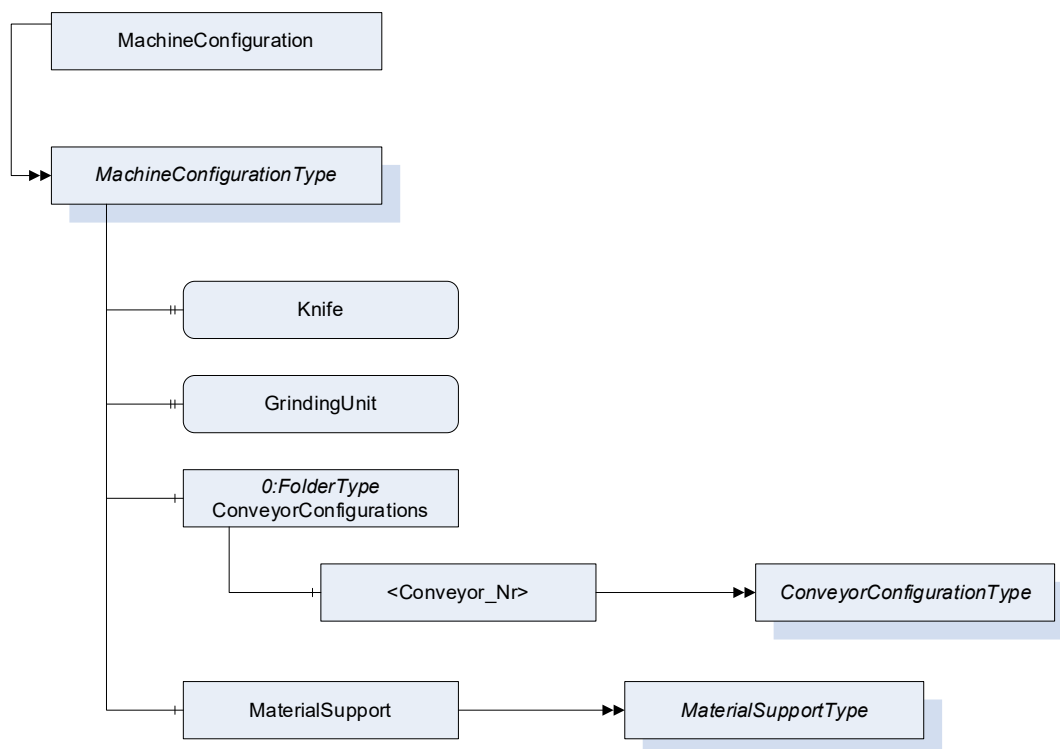


Figure 2 – MachineConfiguration Overview

Table 4 – MachineConfigurationType Definition

Attribute	Value				
BrowseName	MachineConfigurationType				
IsAbstract	False				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of 0:BaseObjectType defined in OPC 10000-5					
0:HasProperty	Variable	Knife	0:Boolean	0:PropertyType	M
0:HasProperty	Variable	GrindingUnit	0:Boolean	0:PropertyType	M
0:HasComponent	Object	ConveyorConfigurations		0:FolderType	M
0:HasComponent	Object	MaterialSupport		MaterialSupportType	M
Conformance Units					
OPC 40092-1 Basic					

ConveyorConfigurations has additional subcomponents which are defined in Table 5.

Table 5 – Additional Subcomponents of MachineConfigurationType

Source Path	Reference	NodeClass	BrowseName	DataType	TypeDefinition	Others
ConveyorConfigurations	0:HasComponent	Object	<Conveyor_Nr>	-	ConveyorConfigurationType	OP

7.2 Knife

A property with 0:Boolean data type. Its value is 1 if is physically present in a foam cutting machine and is used for its normal operation.

7.3 GrindingUnit

A property with 0:Boolean data type. Its value is 1 if a grinding unit is physically present in a foam cutting machine.

7.4 ConveyorConfigurations

An instance declaration of the *0:FolderType*. It provides a folder to organize the child nodes that represent the configurations of the conveyers that are attached, to a foam cutting unit.

7.4.1 Conveyor

The contents of this folder, namely the subcomponents of *ConveyorConfigurations* listed in Table 5. The *ConveyorConfigurationType* is defined in section 8

When instances for device *conveyor* are created, the *BrowseNames* shall be "<Conveyor_Nr>" ("Nr" starting with 001).

Example: "Conveyor_001"

A human-readable information can be given in the *Node Attribute DisplayName*.

7.5 MaterialSupport

An instance declaration of *MaterialSupportType*, detailed in section 9

8 ConveyorConfigurationType

8.1 ConveyorConfigurationType definition

The *ConveyorConfigurationType* details the configuration of the conveyor that is used to feed material towards or away from the cutting edge of the knife.

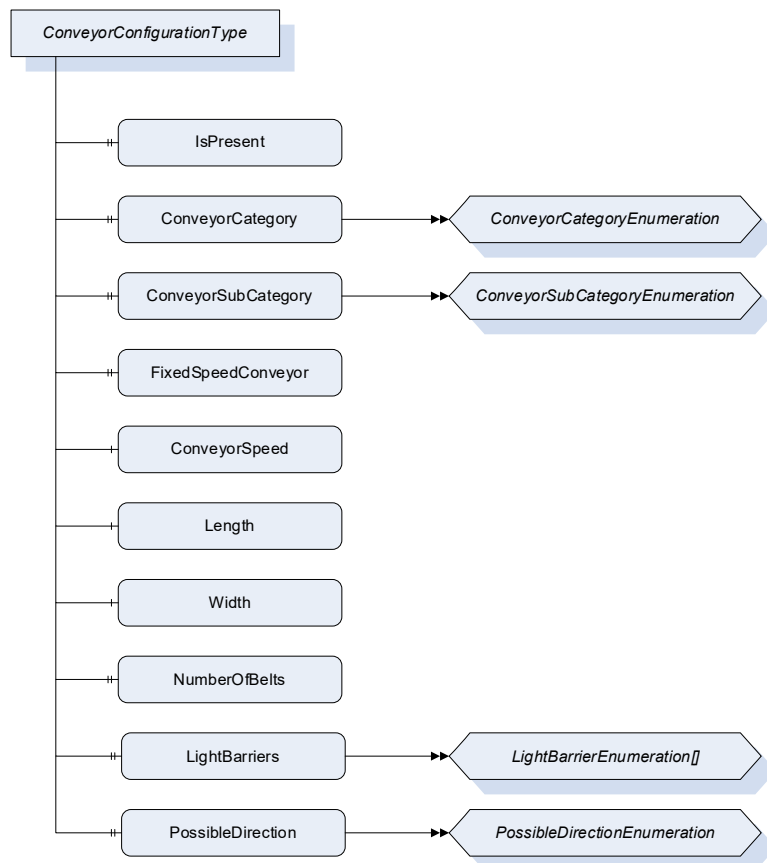


Figure 3 – ConveyorConfigurationType Overview

Table 6 – ConveyorConfigurationType Definition

Attribute	Value				
BrowseName	ConveyorConfigurationType				
IsAbstract	False				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of 0:BaseObjectType defined in OPC 10000-5					
0:HasProperty	Variable	IsPresent	0:Boolean	0:PropertyType	M,RO
0:HasProperty	Variable	ConveyorCategory	ConveyorCategoryEnumeration	0:PropertyType	M,RO
0:HasProperty	Variable	ConveyorSubCategory	ConveyorSubCategoryEnumeration	0:PropertyType	M,RO
0:HasProperty	Variable	FixedSpeedConveyor	0:Boolean	0:PropertyType	M,RO
0:HasComponent	Variable	ConveyorSpeed	0:Double	0:AnalogUnitRangeType	M,RO
0:HasComponent	Variable	Length	0:Double	0:AnalogUnitType	M,RO
0:HasComponent	Variable	Width	0:Double	0:AnalogUnitType	M,RO
0:HasProperty	Variable	NumberOfBelts	0:UInt16	0:PropertyType	M,RO
0:HasProperty	Variable	LightBarriers	LightBarrierEnumeration[]	0:PropertyType	M,RO
0:HasProperty	Variable	PossibleDirection	PossibleDirectionEnumeration	0:PropertyType	M,RO
Conformance Units					
OPC 40092-1 ConveyorConfiguration					

8.2 IsPresent

The *IsPresent Property* provides information, if an instance of the conveyor is present in the current configuration of the machine.

8.3 ConveyorCategory

This property provides information, if this conveyor is used for unloading, loading or transportation of material.

The *ConveyorCategoryEnumeration* is defined in Table 7.

Table 7 – ConveyorCategoryEnumeration Items

Name	Value	Description
Loading	0	Loading of material for processing.
Unloading	1	Unloading of material after processing.
Transportation	2	Transportation of material during processing.

8.4 ConveyorSubCategory

This property provides information on what type of conveyor this instance is. The *ConveyorSubCategoryEnumeration* is listed in Table 8.

Table 8 – ConveyorSubCategoryEnumeration Items

Name	Value	Description
None	0	None of the other categories fit.
AlignmentBelt	1	The conveyor is an alignment belt.
Turntable	2	The conveyor is a turntable.
Seperator	3	The conveyor is a separator.
Stacker	4	The conveyor is a stacker.
Destacker	5	The conveyor is a destacker.
PopUp	6	The conveyor is a pop-up conveyor.
ScissorTable	7	The conveyor is a scissor table.
CrossConveyor	8	The conveyor is a cross-conveyor.

8.5 FixedSpeedConveyor

This *Property* provides information, if the conveyor has a fixed speed.

8.6 ConveyorSpeed

This *Variable* provides information about the speed settings of the conveyor. If *FixedSpeedConveyor* is true, this *Variable* provides the set value. If *FixedSpeedConveyor* is false, this *Variable* provides the speed range of the conveyor.

Units: m/s or ft/s

8.7 Length

Length of the conveyor.

Units: mm or in

8.8 Width

Width of the conveyor.

Units: mm or in

8.9 NumberOfBelts

Provides the number of individual belts on the conveyor.

8.10 LightBarriers

Provides information about the positions of light barriers on this instance of conveyor.

Each array entry represents one light barrier.

This property holds the value of LightBarrierEnumeration which is defined in Table 9.

Table 9 – LightBarrierEnumeration Items

Name	Value	Description
None	0	No light barrier.
Infeed	1	Light barrier is positioned infeed.
Outfeed	2	Light barrier is positioned outfeed.
Safety	3	Light barrier is a safety device.
Other	4	None of the other values fit.

8.11 PossibleDirection

Provides information about the possible working directions of the conveyor.

Table 10 – PossibleDirectionEnumeration Items

Name	Value	Description
Forwards	0	The conveyor's working direction is forwards.
Backwards	1	The conveyor's working direction is backwards.
Reversible	2	The conveyor's working direction is reversible.
Sideways	3	The conveyor's working direction is sideways.
Any	4	Any conveyor direction is possible.

9 MaterialSupportType

9.1 MaterialSupportType definition

This *ObjectType* defines the configuration of the physical part of the machine that supports, holds and feeds the foam to be cut. The information model for this *ObjectType* is structured based on the category of the material support, the kinds of fixtures, quantity of vacuum units that hold the foam block in place and the general dimensions of the table.

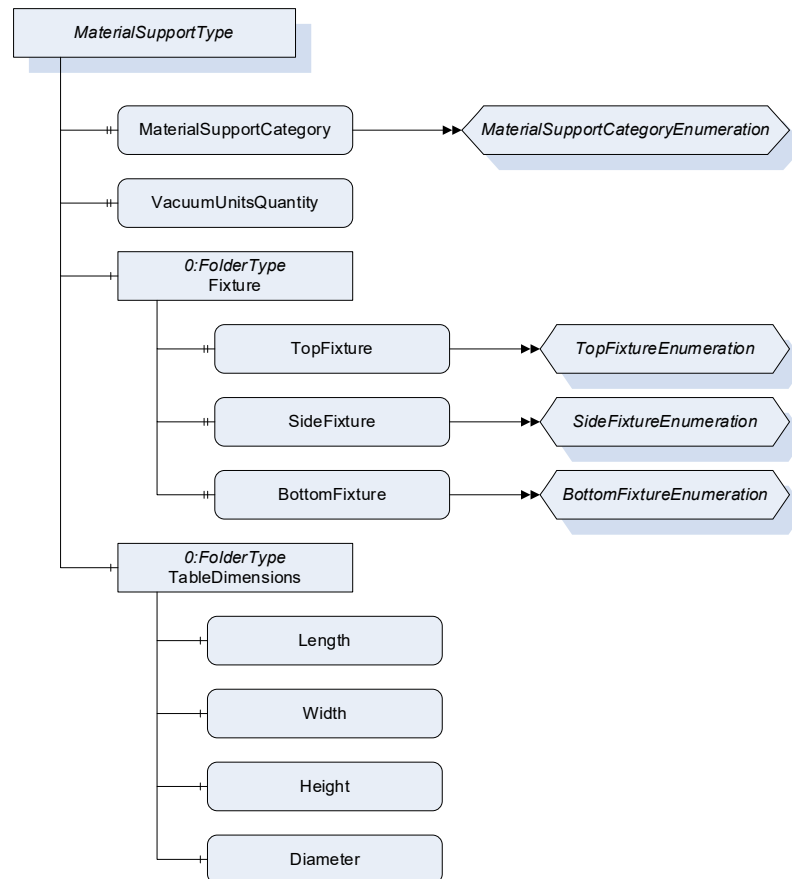


Figure 4 – MaterialSupportType Overview

Table 11 – MaterialSupportType Definition

Attribute	Value				
BrowseName	MaterialSupportType				
IsAbstract	False				
References	Node Class	BrowseName	Data Type	Type Definition	Other
Subtype of 0:BaseObjectType defined in OPC 10000-5					
0:HasProperty	Variable	MaterialSupportCategory	MaterialSupportCategoryEnumeration	0:PropertyType	M, RO
0:HasProperty	Variable	VacuumUnitsQuantity	0:UInt16	0:PropertyType	M, RO
0:HasComponent	Object	Fixture		0:FolderType	M
0:HasComponent	Object	TableDimensions		0:FolderType	M
Conformance Units					
OPC 40092-1 Basic					

The components of the *MaterialSupportType* have additional subcomponents which are defined below.

Table 12 – MaterialSupportType Additional Subcomponents

Source Path	Reference	NodeClass	BrowseName	DataType	TypeDefinition	Others
Fixture	0:HasProperty	Variable	TopFixture	TopFixtureEnumeration	0:PropertyType	M, RO
Fixture	0:HasProperty	Variable	SideFixture	SideFixtureEnumeration	0:PropertyType	M, RO
Fixture	0:HasProperty	Variable	BottomFixture	BottomFixtureEnumeration	0:PropertyType	M, RO
TableDimensions	0:HasComponent	Variable	Length	0:Double	0:AnalogUnitType	O, RO
TableDimensions	0:HasComponent	Variable	Width	0:Double	0:AnalogUnitType	O, RO
TableDimensions	0:HasComponent	Variable	Height	0:Double	0:AnalogUnitType	O, RO
TableDimensions	0:HasComponent	Variable	Diameter	0:Double	0:AnalogUnitType	O, RO

9.2 MaterialSupportCategory

This *Property* provides information about the category of the material support system. The *MaterialSupportCategoryEnumeration* is defined in Table 13.

Table 13 – MaterialSupportCategoryEnumeration Definition

Name	Value	Description
None	0	The machine has no material support system, the material must be fed in accordingly.
Fixed_Machine_Table	1	The material support system is a fixed machine table.
Sliding_Machine_Table	2	The material support system is a sliding machine table.
Carousel	3	The material support system is a carousel.
Conveyor_Belt	4	The material support system is a conveyor belt.
Turntable_90Degrees	5	The material support system is a turntable, which can rotate 90 degrees.

9.3 VacuumUnitsQuantity

This *Property* provides information about the total number of vacuum units on the material support system.

9.4 Fixture

Fixture is an instance declaration of the *0:FolderType*. It provides a folder to organize the child nodes that represent the different material fixture systems for the material top, bottom and sides.

9.4.1 TopFixture

Provides information about the type of material fixture for the material top. The *TopFixtureEnumeration* is defined in Table 14.

Table 14 – TopFixtureEnumeration Definition

Name	Value	Description
None	0	The machine has no top fixture.
Pressure_Pad	1	The top fixture is a pressure pad.
Pressure_Roller	2	The top fixture is a pressure roller.

9.4.2 SideFixture

Provides information about the type of material fixture for the material side. The *SideFixtureEnumeration* is defined in Table 15.

Table 15 – SideFixtureEnumeration Definition

Name	Value	Description
None	0	The machine has no side fixture.
Right	1	The material is fixed on the right side.
Left	2	The material is fixed on the left side.
Both	3	The material is fixed on both sides.

9.4.3 BottomFixture

Provides information about the type of material fixture for the material bottom. The *BottomFixtureEnumeration* is defined in Table 16.

Table 16 – BottomFixtureEnumeration Definition

Name	Value	Description
None	0	The machine has no bottom fixture.
Mechanical_Fixture	1	The material is fixed to the bottom in a mechanical way.
Vacuum_Fixture	2	The material is fixed to the bottom by vacuum.

9.5 TableDimensions

TableDimensions is an instance declaration of the *0:FolderType*. It provides a folder to organize the child nodes that represent the dimensions of the material support system.

9.5.1 Length

Provides the lengths of the material support system.

Units: mm or in

9.5.2 Width

Provides the width of the material support system.

Units: mm or in

9.5.3 Height

Provides the width of the material support system.

Units: mm or in

9.5.4 Diameter

Provides the diameter of the material support system, e.g. for a turntable.

Units: mm or in

10 ProcessMonitoringType

10.1 ProcessMonitoringType definition

Node Type: ObjectType, Parent Node: FoamCuttingMachineType

The *ProcessMonitoring ObjectType* provides the process values of the different components of the foam cutting machine and is formally defined in Table 17.

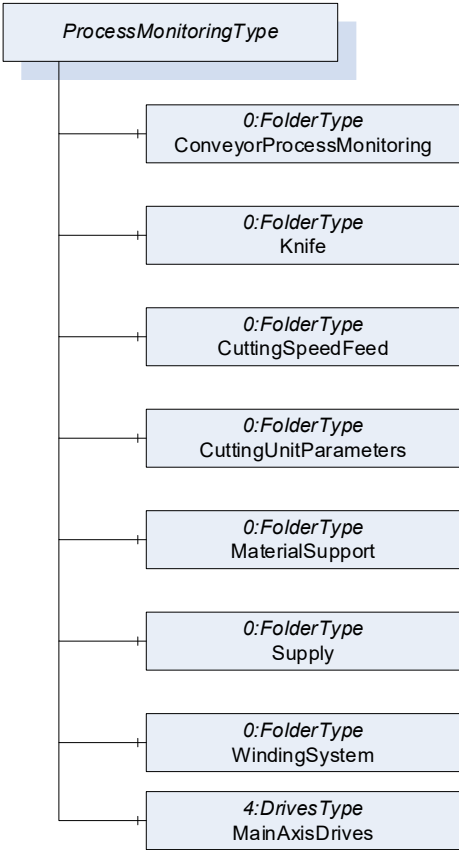


Figure 5 – ProcessMonitoringType Overview

Table 17 – ProcessMonitoringType ObjectType Definition

Attribute	Value				
BrowseName	ProcessMonitoringType				
IsAbstract	False				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of the 0:BaseObjectType defined in OPC UA 10000-5					
0:HasComponent	Object	ConveyorProcessMonitoring		0:FolderType	M
0:HasComponent	Object	Knife		0:FolderType	M
0:HasComponent	Object	CuttingSpeedFeed		0:FolderType	M
0:HasComponent	Object	CuttingUnitParameters		0:FolderType	M
0:HasComponent	Object	MaterialSupport		0:FolderType	M
0:HasComponent	Object	Supply		0:FolderType	M
0:HasComponent	Object	WindingSystem		0:FolderType	M
0:HasComponent	Object	MainAxisDrives		4:DrivesType	M
Conformance Units					
OPC 40092-1 Basic					
OPC 40092-1 ConveyorProcessMonitoring					
OPC 40092-1 Knife					
OPC 40092-1 CuttingSpeedFeed					
OPC 40092-1 CuttingUnitParameters					
OPC 40092-1 MaterialSupport					
OPC 40092-1 Supply					
OPC 40092-1 WindingSystem					
OPC 40092-1 MainAxisDrives					

The components of the *ProcessMonitoringType* have additional subcomponents which are defined in Table 18.

Table 18 – ProcessMonitoringType Additional Subcomponents

Source Path	Reference	NodeClass	BrowseName	DataType	TypeDefinition	Others
ConveyorProcessMonitoring	0:HasComponent	Object	<Conveyor_Nr>		ConveyorProcessMonitoringType	OP
Knife	0:HasComponent	Variable	KnifeRunning	0:Boolean	0:BaseDataVariableType	M, RO
Knife	0:HasComponent	Variable	KnifeSpeed	0:Double	0:AnalogUnitType	O, RO
Knife	0:HasComponent	Object	WearStatus		4:MaintenanceType	O
Knife	0:HasComponent	Variable	GrindingUnitSpeed	0:Double	0:AnalogUnitType	O, RO
Knife	0:HasComponent	Variable	GrindingUnitState	GrindingUnitStateEnumeration	0:BaseDataVariableType	O, RO
Knife	0:HasComponent	Variable	Readjustment	0:Double	0:AnalogUnitType	O, RO
Knife	0:HasComponent	Object	KnifeDrive		4:DriveType	O
CuttingSpeedFeed	0:HasComponent	Variable	MaxMachineLimit	0:Double	0:AnalogUnitType	O,RO
CuttingSpeedFeed	0:HasComponent	Variable	RecipeLimit	0:Double	0:AnalogUnitType	O,RO
CuttingSpeedFeed	0:HasComponent	Variable	RecipeLimitIdle	0:Double	0:AnalogUnitType	O,RO
CuttingSpeedFeed	0:HasComponent	Variable	Override	0:Double	0:BaseDataVariableType	O,RO
CuttingSpeedFeed	0:HasComponent	Variable	OverrideIdle	0:Double	0:BaseDataVariableType	O,RO
CuttingSpeedFeed	0:HasComponent	Variable	CurrentValue	0:Double	0:AnalogUnitType	O,RO
CuttingUnitParameters	0:HasComponent	Variable	CuttingThickness	0:Double	0:AnalogUnitType	O,RO
CuttingUnitParameters	0:HasComponent	Variable	CuttingAngle	0:Double	0:AnalogUnitType	O,RO
CuttingUnitParameters	0:HasComponent	Variable	CuttingUnitPosition	0:Double	0:AnalogUnitType	O,RO
CuttingUnitParameters	0:HasComponent	Variable	PressureRollerOffset	0:Double	0:AnalogUnitType	O,RO
MaterialSupport	0:HasComponent	Variable	ActiveVacuumUnits	0:UInt16	0:BaseDataVariableType	O,RO
MaterialSupport	0:HasComponent	Variable	SideFixtureActive	0:Boolean	0:BaseDataVariableType	O,RO
MaterialSupport	0:HasComponent	Variable	TopFixtureActive	0:Boolean	0:BaseDataVariableType	O,RO
MaterialSupport	0:HasComponent	Variable	Orientation	0:Double	0:AnalogUnitType	O,RO
Supply	0:HasComponent	Object	CompressedAir		4:EnergyType	O
Supply	0:HasComponent	Object	Electricity		4:EnergyType	O
WindingSystem	0:HasComponent	Variable	TargetFoilLength	0:Double	0:AnalogUnitType	O
WindingSystem	0:HasComponent	Variable	ActualFoilLength	0:Double	0:AnalogUnitType	O
WindingSystem	0:HasComponent	Variable	RollCounter	0:UInt32	0:BaseDataVariableType	O
WindingSystem	0:HasComponent	Variable	RollStop	0:UtcTime	0:BaseDataVariableType	O
WindingSystem	0:HasComponent	Variable	SpeedOffset	0:Double	0:AnalogUnitType	O

10.2 ConveyorProcessMonitoring

This folder provides the process values of the conveyors for the transport of material.

10.2.1 Conveyor

The instance of “<Conveyor_Nr>” shall match the instance of “<Conveyor_Nr>” in the *ConveyorConfigurationType*.

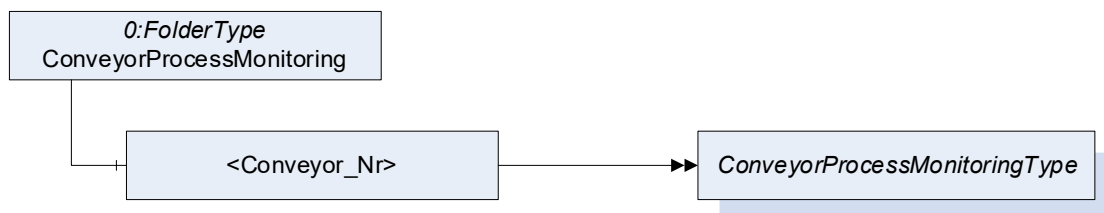


Figure 6 – ConveyorProcessMonitoring folder overview

The *ConveyorProcessMonitoringType* is defined in chapter 11.

10.3 Knife

This folder contains process values of the knife.

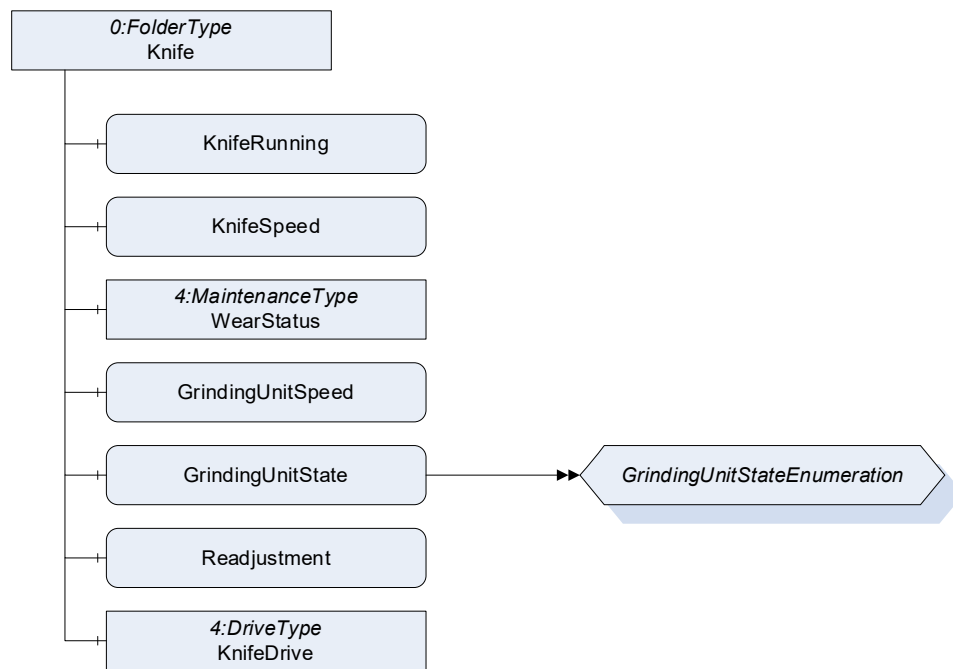


Figure 7 – Knife process values overview

10.3.1 KnifeRunning

Boolean. Indicates if the knife is switched on (true) or off (false).

10.3.2 KnifeSpeed

Provides the set value of the knife.

Units: m / s or ft/s

10.3.3 WearStatus

Provides information about the wear status of the knife. The *MaintenanceType* is defined in OPC 40083.

10.3.4 GrindingUnitSpeed

Provides the set value (or calculated value) of the grinding unit of the knife.

10.3.5 GrindingUnitState

Provides information about the current state of the grinding unit. The *GrindingUnitStateEnumeration* is defined in Table 19.

Table 19 – GrindingUnitStateEnumeration Items

Name	Value	Description
Off	0	The grinding unit is switched off.
Standby	1	The grinding unit is in standby mode.
Running	2	The grinding unit is running.

10.3.6 Readjustment

Provides information about the mechanical adjustment in the mounting position of the knife to compensate for wear. Not configurable, only readable during process .

10.3.7 KnifeDrive

Provides information about the drive of the knife. The *DriveType* is defined in OPC 40083.

10.4 CuttingSpeedFeed

The rate at which the material is cut, which would depend e.g. on the feed of the material, the speed and sharpness of the knife.

Units: m/min

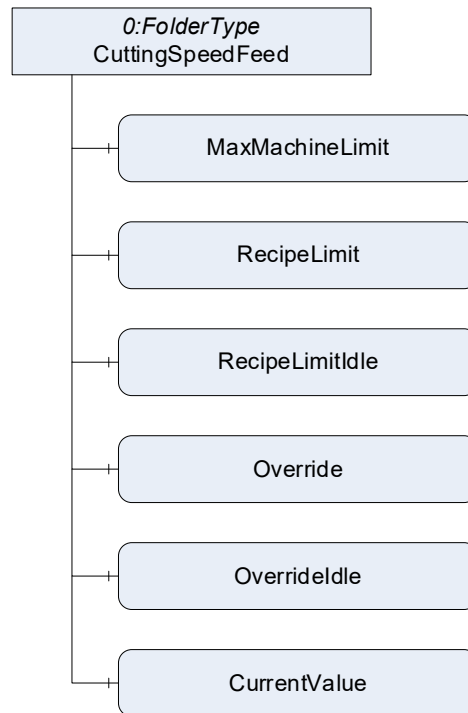


Figure 8 – CuttingSpeed_Feed Overview

10.4.1 MaxMachineLimit

The maximum mechanically achievable speed by the machine due to the drive, gears and other moving parts. The value applies for cutting and idle speed.

Units: m/min or ft/min

10.4.2 RecipeLimit

Provides the order (recipe) specific limit of the cutting speed when the knife is cutting material.

Same units as *MaxMachineLimit*

10.4.3 RecipeLimitIdle

Provides the order (recipe) specific limit of the return speed of the knife to cut start position.

Same units as *MaxMachineLimit*

10.4.4 Override

Provides the current override value in percent (e.g. 50 %), which is manually adjusted by the machine operator. The cutting speed setpoint calculates as follows: Setpoint = Override x RecipeLimit.

10.4.5 OverrideIdle

Same as override but for idle speed.

10.4.6 CurrentValue

Provides the current actual cutting speed.

Same units as *MaxMachineLimit*

10.5 CuttingUnitParameters

This folder contains the cutting unit parameters.

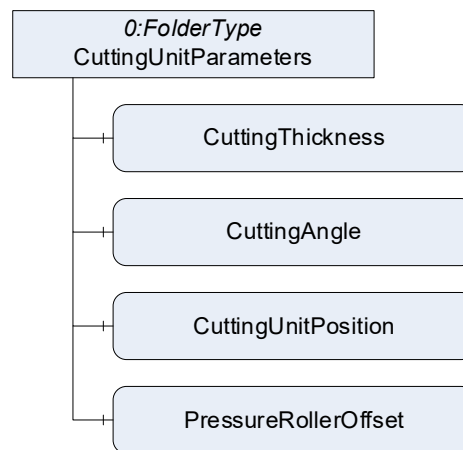


Figure 9 – Cutting Unit Parameters Overview

10.5.1 CuttingThickness

Provides the set value of the cutting thickness.

Units: mm or in

10.5.2 CuttingAngle

Provides the current cutting angle in degrees (°).

10.5.3 CuttingUnitPosition

Provides the actual cutting unit position. Zero (0) means at conveyor level (bottom), while the maximum value means the top level of the block surface.

Units: mm or in

10.5.4 PressureRollerOffset

Provides the offset of the pressure roller. Positive values mean offset inside the material.

Units: mm or in

10.6 MaterialSupport

Provides the process values of the material support system.

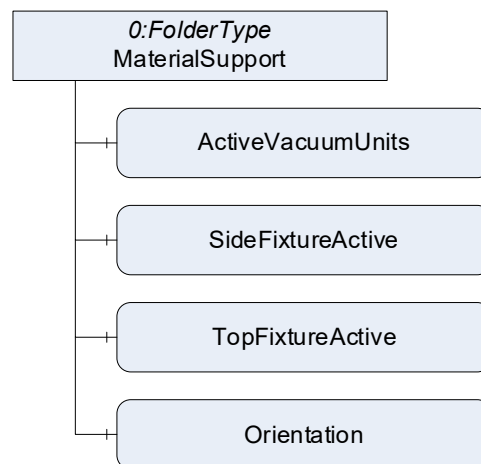


Figure 10 – Material Support Overview

10.6.1 ActiveVacuumUnits

Number of vacuum units that are active. The total number of vacuum units is given in the *MachineConfigurationType*.

10.6.2 SideFixtureActive

Boolean. Indicates if the side fixture is active (true) or not (false).

10.6.3 TopFixtureActive

Boolean. Indicates if the top fixture is active (true) or not (false).

10.6.4 Orientation

Provides information about the actual orientation in degrees (°) of the material support system.

10.7 Supply

Provides information about the energy consumption of the machine. The *EnergyType* is defined in OPC 40083.

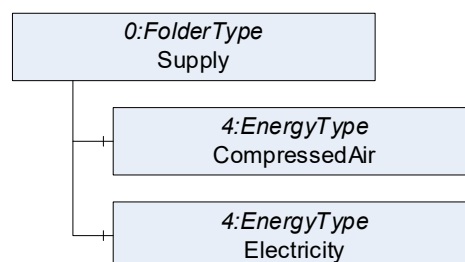


Figure 11 – SupplyType Overview

10.7.1 CompressedAir

Provides information about the compressed air consumption of the machine.

Units: m³ /h or

10.7.2 Electricity

Provides information about the electrical energy consumption of the machine.

10.8 MainAxisDrives

MainAxisDrives is a container object for all main axis drives of the machines.

The *DrivesType* is defined in OPC 40083.

10.9 WindingSystem

Provides information about a winding system installed on the machine.

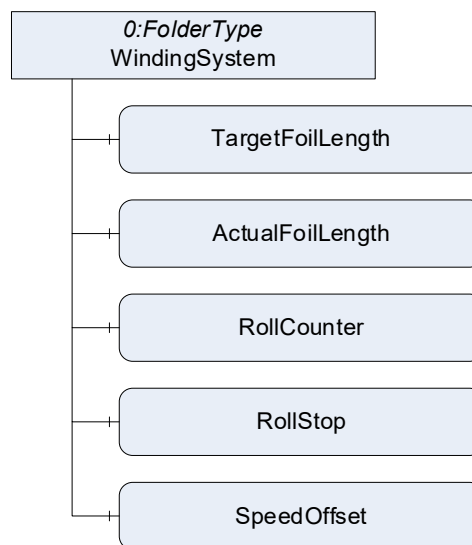


Figure 12 – WindingSystem Overview

Optional object, only in case a winding system is available in the machine.

10.9.1 TargetFoilLength

Provides the set value (target) of the foil length.

Units: m

10.9.2 ActualFoilLength

Provides the actual foil length.

Same units as *TargetFoilLength*.

10.9.3 RollCounter

Provides the total number of wound rolls.

10.9.4 RollStop

Provides the time stamp of the last finished roll. Variable Type is 0:UtcTime defined in OPC 10003

10.9.5 SpeedOffset

Provides the speed offset of the winder. Positive values mean the winder speed is higher than the material feed speed.

Units: m/min

11 ConveyorProcessMonitoringType

11.1 ConveyorProcessMonitoringType definition

The *ConveyorProcessMonitoringType* provides information about the process values of one conveyor and is formally defined in Table 20.

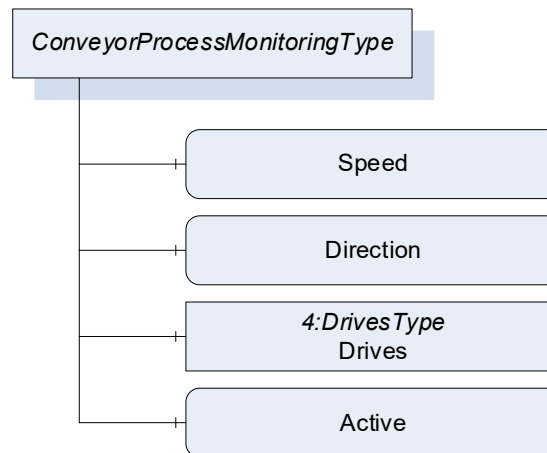


Figure 13 – ConveyorProcessMonitoringType Overview

Table 20 – ConveyorProcessMonitoringType definition

Attribute	Value				
BrowseName	ConveyorProcessMonitoringType				
IsAbstract	False				
References	Node Class	BrowseName	Data Type	TypeDefinition	Other
Subtype of the <i>0:BaseObjectType</i> defined in OPC 10000-5					
0:HasComponent	Variable	Speed	0:Double	0:AnalogUnitType	M,RO
0:HasComponent	Variable	Direction	DirectionEnumeration	0:BaseDataVariableType	M,RO
0:HasComponent	Object	Drives		4:DrivesType	M
0:HasComponent	Variable	Active	0:Boolean	0:BaseDataVariableType	M,RO
Conformance Units					
OPC 40092-1 ConveyorProcessMonitoring					

11.2 Speed

Linear speed in the direction of material flow. Units: m/s or ft/s

11.3 Direction

Provides information about the current transportation direction of the conveyor. The *DirectionEnumeration* is defined in Table 21.

Table 21 – DirectionEnumeration Items

Name	Value	Description
Forward	0	Transportation direction is forward.
Backward	1	Transportation direction is backward.
Sideward	2	Transportation direction is sideward.

11.4 **Drives**

Drives is a container object for all drives of the conveyor.

The *DrivesType* is defined in OPC 40083.

11.5 **Active**

Boolean 0 or 1. Indicates if the conveyor is active.

12 OperationType

12.1 OperationType definition

Provides *Objects* and *Variables* relevant for the operation of the machine and is formally defined in Table 22.

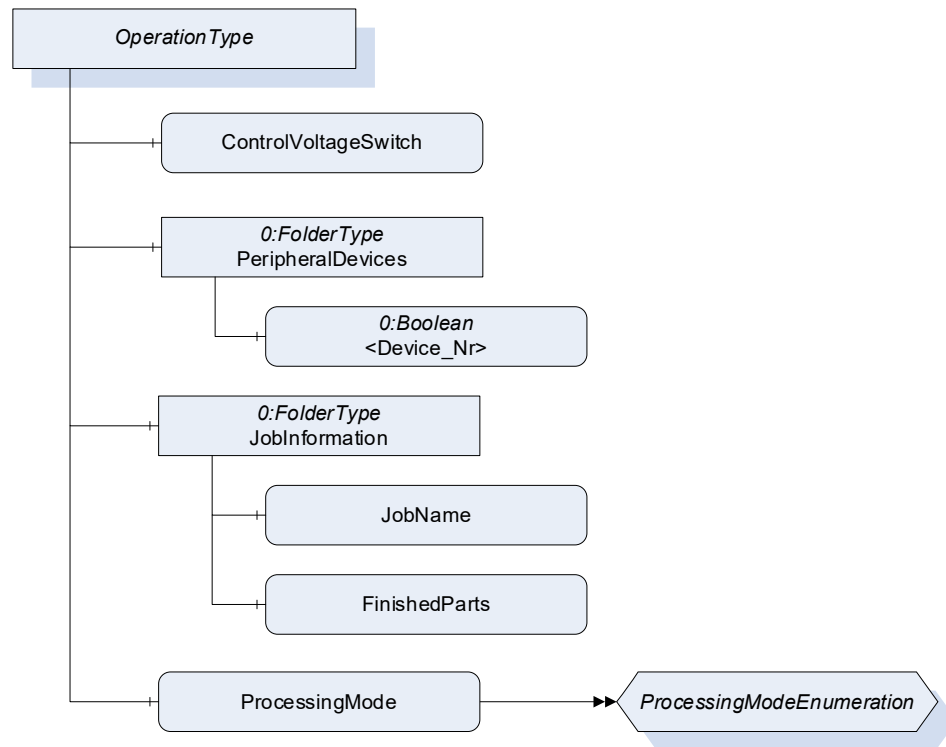


Figure 14 – Overview of OperationType

Table 22 – OperationType ObjectType Definition

Attribute	Value				
BrowseName	OperationType				
IsAbstract	False				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of the 0:BaseObjectType defined in OPC UA 10000-5					
0:HasComponent	Variable	ControlVoltageSwitch	0:Boolean	0:BaseDataVariableType	M, RO
0:HasComponent	Object	PeripheralDevices		0:FolderType	M
0:HasComponent	Object	JobInformation		0:FolderType	M
0:HasComponent	Variable	ProcessingMode	ProcessingModeEnumeration	0:BaseDataVariableType	M, RO
Conformance Units					
OPC 40092-1 PeripheralDevices					
OPC 40092-1 JobInformation					

The components of the *OperationType* have additional subcomponents which are defined in Table 23.

Table 23 – Additional Subcomponents of OperationType

Source Path	Reference	NodeClass	BrowseName	DataType	TypeDefinition	Others
PeripheralDevices	0:HasComponent	Variable	<Device_Nr>	0:Boolean	0:BaseDataVariableType	OP
JobInformation	0:HasComponent	Variable	JobName	0:String	0:BaseDataVariableType	O, RO
JobInformation	0:HasComponent	Variable	FinishedParts	0:UInt32	0:BaseDataVariableType	O, RO

12.2 ControlVoltageSwitch

Provides information, if the control voltage switch is switched on or off. The drives can only be operated with active control voltage.

12.3 PeripheralDevices

Folder containing information about the active state of peripheral devices.

12.3.1 Device

Provides information, if the peripheral device is active or not. Further information shall be provided in the *Description NodeAttribute*.

12.4 JobInformation

The instances of this *ObjectType* provide information about the current job.

12.4.1 JobName

Provides information about the current job name. Readable only, „string“ :AlphaNumeric

12.4.2 FinishedParts

Provides a counter for finished parts, e.g. sheets.

12.5 ProcessingMode

The *ProcessingMode Variable* provides information about the current processing mode as addition to the *MachineOperationMode state Processing*.

Table 24 – ProcessingModeEnumeration Items

Name	Value	Description
Manual	0	Machine is in manual mode
SemiAutomatic	1	Machine is in semi-automatic mode
Automatic	2	Machine is in automatic mode

13 ErrorHandlingType

13.1 ErrorHandlingType definition

The *ErrorHandlingType* provides *Variables* and *Methods* for simple error handling and is formally defined in Table 25.

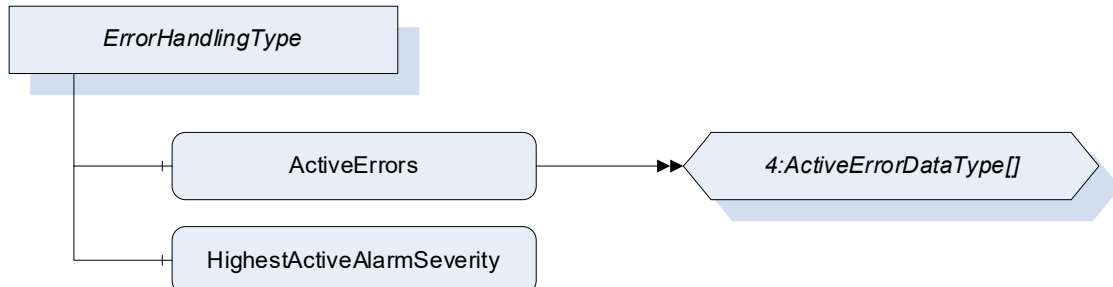


Figure 15 – Overview of ErrorHandlingType

Table 25 – ErrorHandlingType definition

Attribute	Value				
BrowseName	ErrorHandlingType				
IsAbstract	False				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of the 0:BaseObjectType defined in OPC UA 10000-5					
0:HasComponent	Variable	ActiveErrors	4:ActiveErrorDataType[]	0:BaseDataVariableType	M,RO
0:HasComponent	Variable	HighestActiveAlarmSeverity	0:UInt16	0:BaseDataVariableType	O,RO
Conformance Units					
OPC 40092-1 ErrorHandling					

13.2 HighestActiveAlarmSeverity

Description: Indication of the severity of the highest active alarm (0 = no active alarm – 1000 = possible error). Together with *ActiveErrors*, it provides a minimal error handling for devices without alarm support. However, the variable shall be filled even if alarms are supported.

Example: 400

13.3 ActiveErrors

Description: List of the active errors of the device. It provides a minimal error handling for devices without alarm support. However, the variable shall be filled even if alarms are supported. The *ActiveErrorDataType* is defined in OPC 40083. If there is no active error, the array is empty.

14 FoamCuttingCycleInformationEventType

The *FoamCuttingCycleInformationEventType* provides collected information about a production cycle on the foam cutting machine. The trigger for this event is chosen by the vendor, e.g. passing the unloading conveyor light barrier or when a block is fully processed.

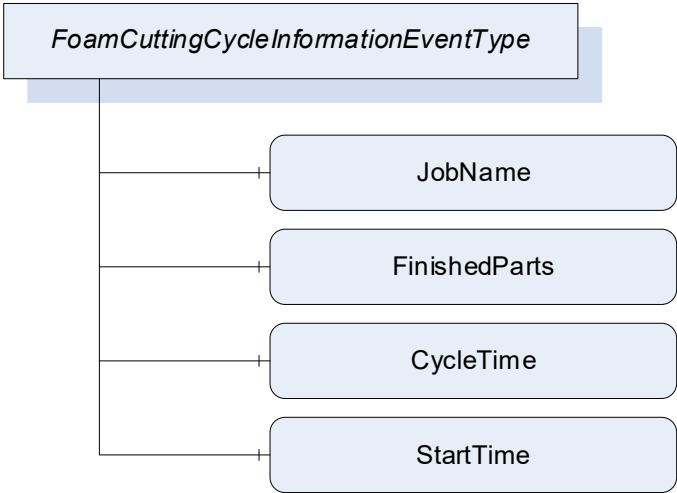


Figure 16 – FoamCuttingCycleInformationEventType overview

Table 26 – FoamCuttingCycleInformationEventType definition

Attribute	Value				
BrowseName	FoamCuttingCycleInformationEventType				
IsAbstract	True				
References	Node Class	BrowseName	DataType	TypeDefinition	Other
Subtype of the 0:BaseEventType defined in OPC UA 10000-5					
0:HasComponent	Variable	JobName	0:String	0:BaseDataVariableType	O
0:HasComponent	Variable	FinishedParts	0:UInt32	0:BaseDataVariableType	O
0:HasComponent	Variable	CycleTime	0:Duration	0:BaseDataVariableType	O
0:HasComponent	Variable	StartTime	0:UtcTime	0:BaseDataVariableType	O
Conformance Units					
OPC 40092-1 FoamCuttingCycleInformationEvent					

14.1 JobName

Provides the name of the job.

14.2 FinishedParts

Number of finished parts in the period under review.

14.3 CycleTime

Duration of the cycle.

14.4 StartTime

Start time of the cycle.

15 Profiles and Conformance Units

This chapter defines the corresponding profiles and conformance units for the OPC UA Information Model for OPC 40092-1. *Profiles* are named groupings of conformance units. Facets are profiles that will be combined with other *Profiles* to define the complete functionality of an OPC UA *Server* or *Client*.

15.1 Conformance Units

This chapter defines the corresponding *Conformance Unit* for OPC 40092-1.

Table 27 – Conformance Units for OPC 40092-1

Category	Title	Description
Server	OPC 40092-1 Basic	Support of <i>FoamCuttingMachineType</i> and all mandatory child elements giving information on the foam cutting machine and its status. There is at least one instance of the <i>FoamCuttingMachineType</i> in the <i>Machines Object</i> .
Server	OPC 40092-1 ErrorHandling	Support of <i>ErrorHandlingType</i> and at least all mandatory child elements.
Server	OPC 40092-1 FoamCuttingCycleInformationEvent	Support of <i>FoamCuttingCycleInformationEventType</i> and at least one child element.
Server	OPC 40092-1 ConveyorConfiguration	Support of <i>ConveyorConfigurationType</i> and all mandatory child elements. There is at least one instance of the <i>ConveyorConfigurationType</i> in the <i>ConveyorConfigurations Folder</i> .
Server	OPC 40092-1 Knife	Support of at least <i>KnifeRunning Variable</i> in the <i>Knife Folder</i> .
Server	OPC 40092-1 CuttingSpeedFeed	Support of at least one element in the <i>CuttingSpeedFeed Folder</i> .
Server	OPC 40092-1 CuttingUnitParameters	Support of at least one element in the <i>CuttingUnitParameters Folder</i> .
Server	OPC 40092-1 MaterialSupport	Support of at least one element in the <i>MaterialSupport Folder</i> .
Server	OPC 40092-1 Supply	Support of at least one element in the <i>Supply Folder</i> .
Server	OPC 40092-1 WindingSystem	Support of at least one element in the <i>WindingSystem Folder</i> .
Server	OPC 40092-1- MainAxisDrives	Support of <i>4:DriveType</i> and all mandatory child elements. There is at least one instance of the <i>4:DriveType</i> in the <i>MainAxisDrives Object</i> .
Server	OPC 40092-1 ConveyorProcessMonitoring	Support of <i>ConveyorProcessMonitoringType</i> and all mandatory child elements. There is at least one instance of the <i>ConveyorProcessMonitoringType</i> in the <i>ConveyorProcessMonitoring Folder</i> .
Server	OPC 40092-1 PeripheralDevices	Support of at least one element in the <i>PeripheralDevices Folder</i> .
Server	OPC 40092-1 JobInformation	Support of at least one element in the <i>JobInformation Folder</i> .

15.2 Profiles

15.2.1 Profile list

The following tables specify the facets available for *Servers* that implement the OPC 40092-1 Information Model companion specification.

NOTE: The names of the supported profiles are available in the *Server Object* under *ServerCapabilities.ServerProfileArray*

Table 28 lists all Profiles defined in this document and defines their URIs.

Table 28 – Profile URIs for OPC 40092-1

Profile	URI
OPC 40092-1 Basic Server Profile	http://opcfoundation.org/UA/PlasticsRubber/FlexiblePURFoam/Cutting/Server/Basic

15.2.2 Server Facets

15.2.2.1 Overview

The following sections specify the *Facets* available for *Servers* that implement the OPC 40092-1 companion specification. Each section defines and describes a *Facet* or *Profile*.

15.2.2.2 OPC 40092-1 Basic Server Profile**Table 29 – OPC 40092-1 Basic Server Profile**

Group	Conformance Unit / Profile Title	Mandatory / Optional
Profile	0:Embedded Server 2017 (defined in OPC 10000-7)	M
Profile	0:ComplexType Server Facet (defined in OPC 10000-7)	M
Profile	0:Standard Event Subscription Server Facet (defined in OPC 10000-7)	M
Profile	0:Method Server Facet (defined in OPC 10000-7)	M
Profile	2:BaseDevice Server Facet (defined in OPC 10000-100)	M
Profile	3:Machinery Machine Identification Server Facet	M
Profile	3:Machinery State Server Facet	M
OPC 40092-1	OPC 40092-1 Basic	M
OPC 40092-1	OPC 40092-1 ErrorHandling	O
OPC 40092-1	OPC 40092-1 FoamCuttingCycleInformationEvent	O
OPC 40092-1	OPC 40092-1 ConveyorConfiguration	O
OPC 40092-1	OPC 40092-1 Knife	O
OPC 40092-1	OPC 40092-1 CuttingSpeedFeed	O
OPC 40092-1	OPC 40092-1 CuttingUnitParameters	O
OPC 40092-1	OPC 40092-1 MaterialSupport	O
OPC 40092-1	OPC 40092-1 Supply	O
OPC 40092-1	OPC 40092-1 WindingSystem	O
OPC 40092-1	OPC 40092-1-MainAxisDrives	O
OPC 40092-1	OPC 40092-1 ConveyorProcessMonitoring	O
OPC 40092-1	OPC 40092-1 PeripheralDevices	O
OPC 40092-1	OPC 40092-1 JobInformation	O

16 Namespaces

16.1 Namespace Metadata

Table 30 defines the namespace metadata for this document. The *Object* is used to provide version information for the namespace and an indication about static *Nodes*. Static *Nodes* are identical for all *Attributes* in all *Servers*, including the *Value Attribute*. See OPC 10000-5 for more details.

The information is provided as *Object* of type *NamespaceMetadataType*. This *Object* is a component of the *Namespaces Object* that is part of the *Server Object*. The *NamespaceMetadataType ObjectType* and its *Properties* are defined in OPC 10000-5.

The version information is also provided as part of the ModelTableEntry in the UANodeSet XML file. The UANodeSet XML schema is defined in OPC 10000-6.

Table 30 – NamespaceMetadata Object for this Document

Attribute	Value	
BrowseName	http://opcfoundation.org/UA/PlasticsRubber/FlexiblePURFoam/Cutting/	
Property	DataType	Value
NamespaceUri	String	http://opcfoundation.org/UA/PlasticsRubber/FlexiblePURFoam/Cutting/
NamespaceVersion	String	RC 1.0.0
NamespacePublicationDate	DateTime	2025-09-01
IsNamespaceSubset	Boolean	False
StaticNodeIdsTypes	IdType []	0
StaticNumericNodeIdsRange	NumericRange []	
StaticStringNodeIdsPattern	String	

Note: The *IsNamespaceSubset Property* is set to False as the UaNodeSet XML file contains the complete Namespace. *Servers* only exposing a subset of the Namespace need to change the value to True.

16.2 Handling of OPC UA Namespaces

Namespaces are used by OPC UA to create unique identifiers across different naming authorities. The *Attributes NodeId* and *BrowseName* are identifiers. A *Node* in the *UA AddressSpace* is unambiguously identified using a *NodeId*. Unlike *NodeIds*, the *BrowseName* cannot be used to unambiguously identify a *Node*. Different *Nodes* may have the same *BrowseName*. They are used to build a browse path between two *Nodes* or to define a standard *Property*.

Servers may often choose to use the same namespace for the *NodeId* and the *BrowseName*. However, if they want to provide a standard *Property*, its *BrowseName* shall have the namespace of the standards body although the namespace of the *NodeId* reflects something else, for example the *EngineeringUnits Property*. All *NodeIds* of *Nodes* not defined in this document shall not use the standard namespaces.

Table 31 provides a list of mandatory and optional namespaces used in an OPC 40092-1 OPC UA *Server*.

Table 31 – Namespaces used in a OPC 40092-1 Server

NamespaceURI	Description	Use
http://opcfoundation.org/UA/	Namespace for <i>NodeIds</i> and <i>BrowseNames</i> defined in the OPC UA specification. This namespace shall have namespace index 0.	Mandatory
Local Server URI	Namespace for nodes defined in the local server. This namespace shall have namespace index 1.	Mandatory
http://opcfoundation.org/UA/DI/	Namespace for <i>NodeIds</i> and <i>BrowseNames</i> defined in OPC 10000-100. The namespace index is <i>Server</i> specific.	Mandatory
http://opcfoundation.org/UA/Machinery/	Namespace for <i>NodeIds</i> and <i>BrowseNames</i> defined in OPC UA for Machinery – Part 1: Basic Building Blocks (OPC 40001-1). The namespace index is <i>Server</i> specific.	Mandatory
http://opcfoundation.org/UA/PlasticsRubber/GeneralTypes/	Namespace for <i>NodeIds</i> and <i>BrowseNames</i> defined in OPC 40083. The namespace index is server specific.	Mandatory
http://opcfoundation.org/UA/PlasticsRubber/FlexiblePURFoam/Cutting/	Namespace for <i>NodeIds</i> and <i>BrowseNames</i> defined in this document. The namespace index is <i>Server</i> specific.	Mandatory
Vendor specific types	A <i>Server</i> may provide vendor-specific types like types derived from <i>ObjectTypes</i> defined in this document in a vendor-specific namespace.	Optional
Vendor specific instances	A <i>Server</i> provides vendor-specific instances of the standard types or vendor-specific instances of vendor-specific types in a vendor-specific namespace. It is recommended to separate vendor specific types and vendor specific instances into two or more namespaces.	Mandatory

Table 32 provides a list of namespaces and their indices used for *BrowseNames* in this document. The default namespace of this document is not listed since all *BrowseNames* without prefix use this default namespace.

Table 32 – Namespaces used in this document

NamespaceURI	Namespace Index	Example
http://opcfoundation.org/UA/	0	0:EngineeringUnits
http://opcfoundation.org/UA/DI/	2	2:DeviceClass
http://opcfoundation.org/UA/Machinery/	3	3:MachineIdentificationType
http://opcfoundation.org/UA/PlasticsRubber/GeneralTypes/	4	4:MachineInformationType

Annex A (normative)

OPC 40092-1 Namespace and mappings

A.1 NodeSet and supplementary files for OPC 40092-1 Information Model

The OPC 40092-1 *Information Model* is identified by the following URI:

<http://opcfoundation.org/UA/PlasticsRubber/FoamCutting/>

Documentation for the NamespaceUri can be found [here](#).

The *NodeSet* associated with this version of specification can be found here:

<https://reference.opcfoundation.org/nodesets/?u=http://opcfoundation.org/UA/PlasticsRubber/FoamCutting/&v=1.0.0&i=1>

The *NodeSet* associated with the latest version of the specification can be found here:

<https://reference.opcfoundation.org/nodesets/?u=http://opcfoundation.org/UA/PlasticsRubber/FoamCutting/&i=1>

Supplementary files for the OPC 40092-1 *Information Model* can be found here:

<https://reference.opcfoundation.org/nodesets/?u=http://opcfoundation.org/UA/PlasticsRubber/FoamCutting/&v=1.0.0&i=2>

The files associated with the latest version of the specification can be found here:

<https://reference.opcfoundation.org/nodesets/?u=http://opcfoundation.org/UA/PlasticsRubber/FoamCutting/&i=2>
