European Plastics and Rubber Machinery

EUROMAP 84.3	OPC UA interfaces for plastics and rubber machinery – Extrusion – Part 3: Extruder

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Foreword

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

OPC 40084-3 describes the interface between extruders as part of an extrusion line and manufacturing execution systems (MES) for data exchange. MES are used for collecting the information generated by extrusion lines at a central point for easier quality assurance and job and dataset management. The target of OPC 40084-3 is to provide a unique interface for extruders and MES from different manufacturers to ensure compatibility.

The following functionalities are covered:

– General information about the extruder (manufacturer, model, serial number…), current configuration and status of the extruder.

– Recipe management: Extruders store their configurations in so-called recipes. These include information on nominal process parameters (temperatures, dosing volumens …). OPC 40084-3 allows transferring datasets between extruders and MES for building a central repository of recipes.

Following functions are not included:

– Safety related signals like emergency stop

– Direct control of machine movements by the MES

This part of OPC 40084 deals with extruders as part of an extrusion line. The extrusion line as overall system is defined in OPC 40084-2.

Information models for its components (extruder, dies, winders…) are defined in the other parts.

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) applies

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

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

OPC 10000-2, *OPC Unified Architecture - Part 2: Security Model*

http://www.opcfoundation.org/UA/Part2/

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

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

OPC 10000-4, *OPC Unified Architecture - Part 4: Services*

http://www.opcfoundation.org/UA/Part4/

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 10000-9, *OPC Unified Architecture - Part 9: Alarms and Conditions*

http://www.opcfoundation.org/UA/Part9/

OPC 10000-11, *OPC Unified Architecture - Part 11: Historical Access*

http://www.opcfoundation.org/UA/Part11/

OPC 10001-1, *OPC Unified Architecture V1.04 - Amendment 1: AnalogItem Types*

http://www.opcfoundation.org/UA/Amendment1/

OPC 10001-3, *OPC Unified Architecture V1.04 - Amendment 3: Method Metadata*

http://www.opcfoundation.org/UA/Amendment3/

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

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

OPC 40083: OPC UA interfaces for plastics and rubber machinery – General Type definitions (version 1.02)

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

OPC 40084-1: OPC UA interfaces for plastics and rubber machinery – Extrusion – Part 1: General Type Definitions (version 1.0)

http://www.opcfoundation.org/UA/PlasticsRubber/Extrusion/GeneralTypes/

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 40084-3 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

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 extruder (manufacturer, model, serial number…), current configuration and status of the extruder.

– Recipe management: Extruders store their configurations in so-called recipes. These include information on nominal process parameters (temperatures, dosing volumens …). OPC 40084-3 allows transferring datasets between extruders and MES for building a central repository of recipes.

6 Basic security requirements

6.1 Application Security

For the communication between the extrusion line and MES the OPC UA application authentication via X509 certificates shall be used. OPC UA provides functionalities for using self-signed certificates that have to be manually added to a “trust list” as well as for certificates issued by a certificate authority (CA).

The minimum requirements of the protocol level for a OPC 40084-3 compliant connection are:

– Use of (self-signed) certificates for OPC UA application authentication

– Security Policy: Basic256

– Message Security Mode: sign

NOTE: It is not fixed by this specification if the certificate includes a fixed IP address and/or the host name. However, if the certificate includes a host name, a DNS server is expected to resolve the host name. An OPC UA GDS (Global Discovery Server) can be used to manage the connections and certificates.

6.2 User security/Access control

6.2.1 On extrusion line

On the extrusion line authentication via user name and password is commonly used.

6.2.2 On MES

For the users and roles of the connection the following applies:

– User names can be manufacturer dependent.

- Standard roles are
  - “OPC40084”: read and write access for selected parameters
  - “OPC40084_read_only”: no writing permissions
- Manufactures can add additional roles. They may not start with “OPC40084”. For these roles, more parameters can be writeable than for the OPC40084 role.
- The standard user “OPC40084” has the role “OPC40084” (and no other additional role), “OPC4004_read_only” has the roll “OPC40084_read_only” (and no other additional role); the passwords for the standard users are defined by the manufacturers (they may be empty).

NOTE: OPC UA also allow an anonymous-token (e.g. for testing)

7 Extruder_InterfaceType

7.1 Extruder_InterfaceType Definition

This OPC UA *ObjectType* is used for the root *Object* representing an extruder as part of an extrusion line. It is based on the *ExtrusionDeviceType* (defined in OPC 40084-1) and formally defined in Table 1.

The instance(s) of *Extruder_InterfaceType* shall be located under the *DeviceSet Object* of the Server (see OPC UA Part 100).

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

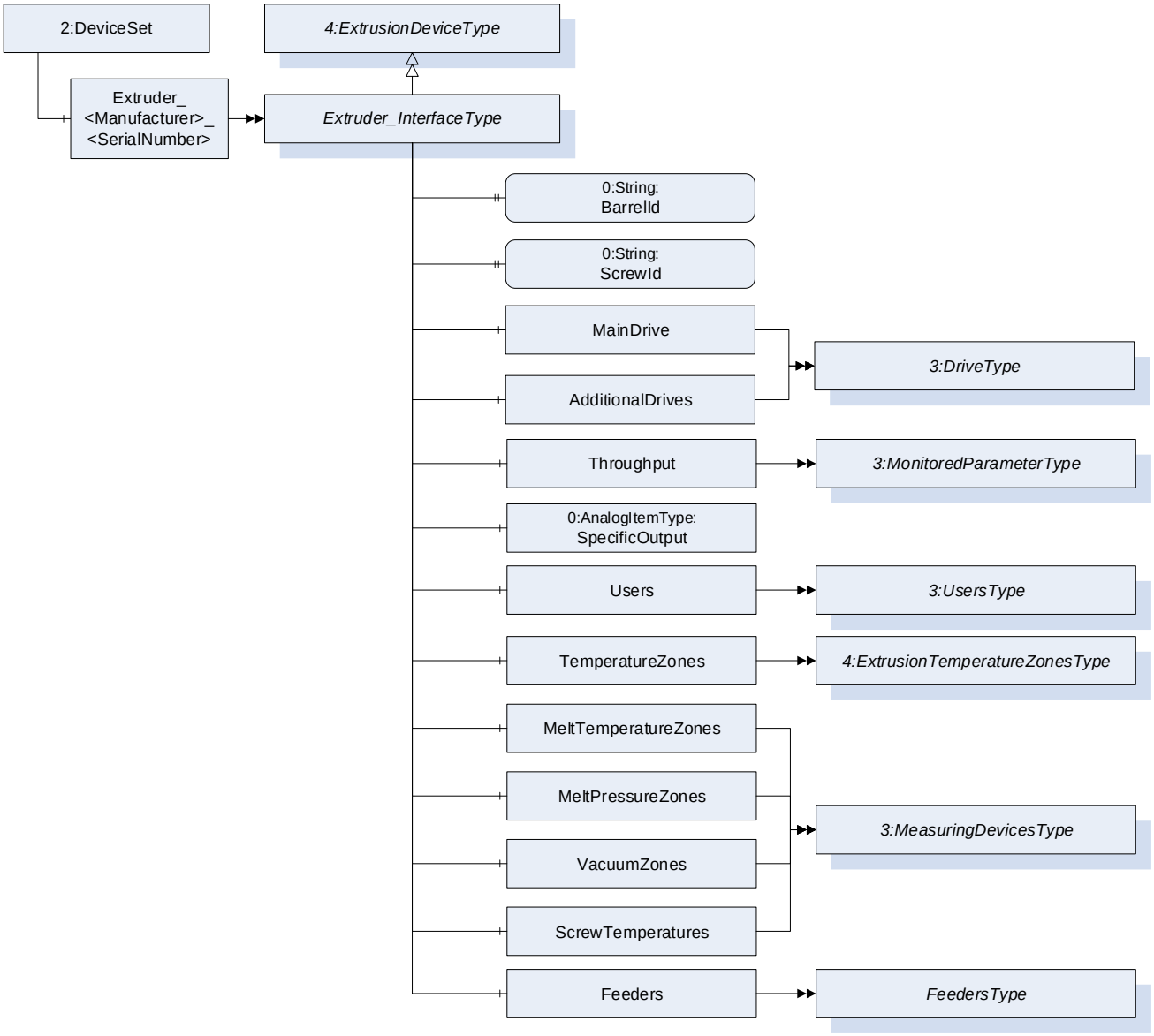

Figure 1 – Extruder_MES_InterfaceType Overview

Table 1 – Extruder_InterfaceType Definition

Attribute	Value				
BrowseName	Extruder_InterfaceType				
IsAbstract	False				
References	**Node Class**	**BrowseName**	**DataType**	**TypeDefinition**	**Other**
Subtype of 4:*ExtrusionDeviceType* (defined in OPC 40084-1)					
0:HasProperty	Variable	BarrelId	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	ScrewId	0:String	0:PropertyType	O, RO
0:HasComponent	Object	MainDrive		3:DriveType	O
0:HasComponent	Object	AdditionalDrives		3:DrivesType	O
0:HasComponent	Object	Throughput		3:MonitoredParameterType	O
0:HasComponent	Variable	SpecificOutput	0:Double	0:AnalogUnitType	O, RO
0:HasComponent	Object	Users		3:UsersType	M
0:HasComponent	Object	TemperatureZones		4:ExtrusionTemperatureZonesType	M
0:HasComponent	Object	MeltTemperatureZones		3:MeasuringDevicesType	O
0:HasComponent	Object	MeltPressureZones		3:MeasuringDevicesType	O
0:HasComponent	Object	VacuumZones		3:MeasuringDevicesType	O
0:HasComponent	Object	ScrewTemperatures		4:ExtrusionTemperatureZonesType	O
0:HasComponent	Object	Feeders		FeedersType	O

The *BrowseName* of the object instance shall be "Extruder_<Manufacturer>_<SerialNumber>"

Example: "Extruder_Coperion_0123456".

7.2 DeviceClass

The *DeviceClass Property* in the *MachineInformation* Object inside the *ExtrusionDeviceType* shall have the value "Extruder".

7.3 LineId

This *Property* indicates to which extrusion line the extruder belongs to (e.g. “blown film line 2”)

7.4 MachineConfiguration

The *MachineConfigurationType* is defined in OPC 40083 and provides information on the current configuration of a machine/device.

7.5 BarrelId

This *Property* indicates the Id of the barrel.

7.6 ScrewId

This Property indicates the Id of the screw.

7.7 MainDrive, AdditionalDrives

These object give information about the main drive and additional drives of the extruder. The *DrivesType* and *DriveType* are defined in OPC 40083.

NOTE: Drives are independent from extruder zones. That means that e.g. the value of the vacuum shall be in the VacuumZones and also switching the vacuum shall be inside the VacuumZone. If a vacuum pump is modelled separately as additional drive, this is used for additional information (e.g. Energy).

7.8 Throughput

Throughput of the extruder in mass per time (e.g. kg/h).

7.9 SpecificOutput

Specific output of the extruder in mass per revolution.

7.10 Users

The *UsersType* is defined in OPC 40083 and provides information on the current users on the machine/device.

8 Container objects for the components of an extruder

Several components can occur several times in an extruder (e.g. temperature zones, feeders, screws). For these the following container objects are defined (see container concept in OPC 40083):

– TemperatureZones

– MeltTemperatureZones

– MeltPressureZones

– VacuumZones

– ScrewTemperatures

– AdditionalMeasuringDevices

– Feeders

8.1 TemperatureZones

This *ObjectType* is a container for the temperature zones on the extruder barrel. The *ExtrusionTemperatureZonesType* is defined in OPC 40084-1.

8.2 MeltTemperatureZones

This *Object* is a container for the melt temperature zones. The zones are modelled as *MeasuringDeviceType* as defined in OPC 40083.

When instances for melt temperature zones are created, the *BrowseNames* shall be "MeltTemperatureZone_<Nr>" where <Nr> is a three-digit number with leading zeros, starting with “001”.

The temperature of the melt shall be delivered in °C or F.

8.3 MeltPressureZones

This *Object* is a container for the melt pressure zones. The zones are modelled as *MeasuringDeviceType* as defined in OPC 40083.

When instances for melt pressure zones are created, the *BrowseNames* shall be "MeltPressureZone_<Nr>" where <Nr> is a three-digit number with leading zeros, starting with “001”.

The pressure of the melt shall be delivered in bar or lbf/in² (=psi).

8.4 VacuumZones

This *Object* is a container for the vacuum zones. The zones are modelled as *MeasuringDeviceType* as defined in OPC 40083.

When instances for vacuum zones are created, the *BrowseNames* shall be "VacuumZone_<Nr>" where <Nr> is a three-digit number with leading zeros, starting with “001”.

The pressure (absolute based on 0) shall be delivered in bar or lbf/in² (=psi).

8.5 ScrewTemperatures

This *Object* is a container for screw temperatures. The temperatures are modelled as *ExtrusionTemperatureZonesType* as defined in OPC 40084-1.

When instances for screw temperatures are created, the *BrowseNames* shall be "ScrewTemperature_<Nr>" where <Nr> is a three-digit number with leading zeros, starting with “001”.

The temperature of the screw shall be delivered in °C of F.

8.6 FeedersType

This *ObjectType* is a container for the feeders. It is formally defined in Table 2.

Table 2 – FeedersType Definition

Attribute	**Value**				
BrowseName	FeedersType				
IsAbstract	False				
References	**Node Class**	**BrowseName**	**DataType**	**TypeDefinition**	**Other**
Subtype of 0:*BaseObjectType* defined in OPC UA Part 5					
0:HasProperty	Variable	0:NodeVersion	0:String	0:PropertyType	M, RO
0:HasComponent	Object	Feeder_<Nr>		FeederType	OP
0:GeneratesEvent	ObjectType	0:GeneralModelChangeEventType			

When instances for feeders and/or dosing units are created, the *BrowseNames* shall be "Feeder_<Nr>" where <Nr> is a three-digit number with leading zeros, starting with "001". The *FeederType* is defined in Table 3.

8.7 FeederType

The *FeederType* represents a device that transports material in an uncontrolled or controlled way. In the second case, the Feeder acts as a dosing unit. A feeder transports the material to a defined destination. This can be directly a barrel zone, but also another feeder which collects materials from several feeders above.

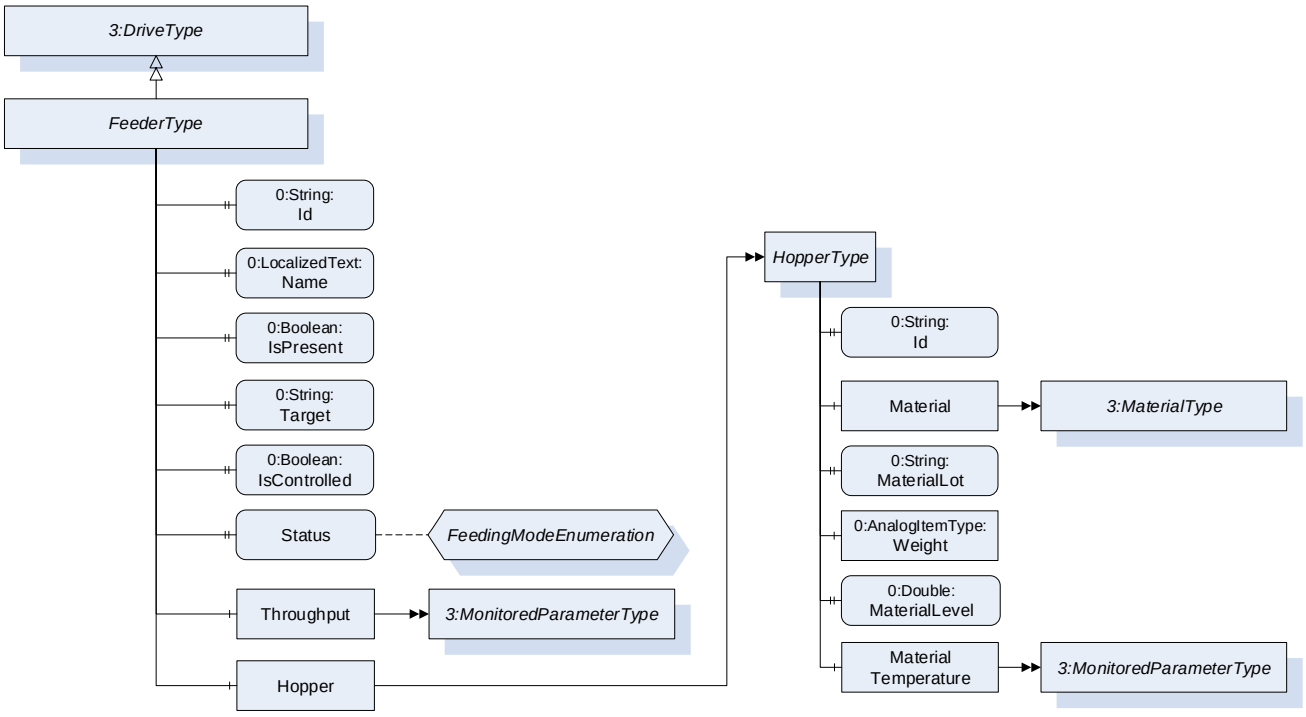

Figure 2 – FeederType Overview

Table 3 – FeederType Definition

Attribute	Value				
BrowseName	FeederType				
IsAbstract	False				
References	**Node Class**	**BrowseName**	**DataType**	**TypeDefinition**	**Other**
Subtype of 3:*DriveType* defined in OPC 40083					
0:HasProperty	Variable	Id	0:String	0:PropertyType	M, RO
0:HasProperty	Variable	Name	0:LocalizedText	0:PropertyType	M, RO
0:HasProperty	Variable	IsPresent	0:Boolean	0:PropertyType	M, RO
0:HasProperty	Variable	Target	0:String	0:PropertyType	M, RO
0:HasProperty	Variable	IsControlled	0:Boolean	0:PropertyType	O, RO
0:HasProperty	Variable	Mode	FeedingModeEnumeration	0:PropertyType	M, RO
0:HasComponent	Object	Throughput		3:MonitoredParameterType	O, RO
0:HasComponent	Object	Hopper		HopperType	O

8.7.1 Name

The *Name Property* gives the name of the feeder/dosing unit and is used as reference in the *Target*. Unique within the extruder

8.7.2 Description

The *Description Property* gives a description of the feeder/dosing unit.

8.7.3 IsPresent

The *IsPresent* Property provides information if the feeder/dosing unit is physically installed and connected.

8.7.4 IsActive

The *IsActive* Property provides information if the fedder/dosing unit is active in the current production.

8.7.5 Target

The *Target* Property provides information to where the feeder brings the material. This can be a barrel zone (ExtrusionTemperatureZone) but also another feeder. The value of the *Target* Property shall be equal to the value of the *Id* Property of the relevant ExtrusionTemperatureZone or feeder.

NOTE: The *Id Property* is modelled inside the *MeasuringDeviceType* which is the basis for all zones.

8.7.6 IsControlled

The *IsControlled* Property provides information, if the feeder is controlled (by a valve, screw, …) or not (material just falls through by gravity).

8.7.7 Mode

The *Mode* Property provides information, how the throughput of the feeder is controlled.

Table 4 – FeedingModeEnumeration Definition

Name	Value	Description
ONLY_CONVEYING	0	The throughput is not controlled. The feeder only transports the material (e.g. by screw, conveyor belt) or the material is only falling through a feed opening
OTHER	1	Throughput is controlled, but in another mode than these below
GRAVIMETRIC	2	The throughput is controlled by a gravimetric dosing system.
VOLUMETRIC	3	The throughput is controlled by a volumetric dosing system.
LIQUID	4	The throughput of liquid material is controlled by a pump.
BATCH	5	The throughput is controlled by a batch dosing system. Note In this case, each material has an own feeder although there is only one physical system.

8.7.8 Throughput

Current throughput of the feeder/dosing unit in mass per time (e.g. kg/h). Although the modelling rule for this node is optional to cover also pure feeders, it is mandatory for dosing units. The *MonitoredParameterType* is defined in OPC 40083.

8.8 HopperType

The *HopperType* represent a device where material is brought into the extrusion process.

Table 5 – HopperType Definition

Attribute	Value				
BrowseName	HopperType				
IsAbstract	False				
References	**Node Class**	**BrowseName**	**DataType**	**TypeDefinition**	**Other**
Subtype of 0:*BaseObjectType* defined in OPC UA Part 5					
0:HasProperty	Variable	Id	0:String	0:PropertyType	M, RO
0:HasComponent	Object	Material		3:MaterialType	M
0:HasProperty	Variable	MaterialLot	0:String	0:PropertyType	O, RO
0:HasComponent	Variable	Weight	0:Double	0:AnalogUnitType	O, RO
0:HasComponent	Variable	MaterialLevel	0:Double	0:BaseDataVariableType	O, RO
0:HasComponent	Object	MaterialTemperature		3:MonitoredParameterType	O

8.8.1 IsActive

The *IsActive* property provides information if the hopper is refilled during the production so that the material is available for the production.

8.8.2 Material

The *Material* property gives information on the current material in the hopper. The *MaterialType* is defined in OPC 40083.

8.8.3 MaterialLot

Lot of the material that is recently filled in the hopper.

8.8.4 Weight

Actual weight of the material in the hopper (e.g. in kg).

8.8.5 MaterialLevel

Actual level of the material in the hopper unit in %.

8.8.6 MaterialTemperature

Actual temperature of the material inside the feeder in °C or °F. The *MonitoredParameterType* is defined in OPC 40083.

9 Profiles and Conformance Units

This chapter defines the corresponding profiles and conformance units for the OPC UA Information Model for OPC 40084-3. *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.* The following tables specify the facets available for *Servers* that implement the OPC 40084-3 Information Model companion specification.

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

Table 6 lists all Profiles defined in this document and defines their URIs.

Table 6 – Profile URIs for OPC 40084-3

Profile	URI
OPC 40084-3 Basic Server Profile	http://opcfoundation.org/UA-Profile/PlasticsRubber/Extrusion/Extruder/Server/Basic
OPC 40084-3 ProductionDatasetManagement Server Facet	http://opcfoundation.org/UA-Profile/PlasticsRubber/Extrusion/Extruder/Server/ProductionDatasetManagement

Table 7 – OPC 40084-3 Basic Server Facet Definition

Conformance Unit	Description	Optional/ Mandatory
OPC 40084-3 Basic	Support of *Extruder_InterfaceType* and all mandatory child elements giving information on the extruder itself and its components.	M
Profile		
ComplexType Server Facet (defined in OPC UA Part 7)		M
Standard Event Subscription Server Facet (defined in OPC UA Part 7)		M
Method Server Facet (defined in OPC UA Part 7)		M
BaseDevice_Server_Facet (defined in OPC UA Part 100)		M

Table 8 – OPC 40084-3 ProductionDatasetManagement Server Facet Definition

Conformance Unit	Description	Optional/ Mandatory
OPC 40084-3 ProductionDatasetManagement	Support of *ProductionDatasetManagementType* (defined in OPC 40083) for the management and transfer of recipes (= production datasets) between MES and extruder	M

10 Namespaces

10.1 Namespace Metadata

Table 9 defines the namespace metadata for this specification. 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 Part5 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 Part5.

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

Table 9 – NamespaceMetadata Object for this Specification

Attribute	Value		
BrowseName	http://opcfoundation.org/UA/PlasticsRubber/Extrusion/Extruder/		
References	**BrowseName**	**DataType**	**Value**
HasProperty	NamespaceUri	String	http://opcfoundation.org/UA/PlasticsRubber/Extrusion/Extruder/
HasProperty	NamespaceVersion	String	1.00
HasProperty	NamespacePublicationDate	DateTime	2020-06-01 00:00:00
HasProperty	IsNamespaceSubset	Boolean	False
HasProperty	StaticNodeIdTypes	IdType[]	{Numeric}
HasProperty	StaticNumericNodeIdRange	NumericRange[]	Null
HasProperty	StaticStringNodeIdPattern	String	Null

10.2 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 10 provides a list of mandatory and optional namespaces used in an OPC 40084-3 OPC UA *Server*.

Table 10 – Namespaces used in an OPC 40084-3 Server

NamespaceURI	Description	Use
http://opcfoundation.org/UA/	Namespace for *NodeIds* and *BrowseNames* 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 may include types and instances used in a device represented by the server. This namespace shall have namespace index 1.	Mandatory
http://opcfoundation.org/UA/DI/	Namespace for *NodeIds* and *BrowseNames* defined in OPC UA Part 100. The namespace index is server specific.	Mandatory
http://opcfoundation.org/UA/PlasticsRubber/GeneralTypes/	Namespace for *NodeIds* and *BrowseNames* defined in OPC 40083. The namespace index is server specific.	Mandatory
http://opcfoundation.org/UA/PlasticsRubber/Extrusion/GeneralTypes/	Namespace for *NodeIds* and *BrowseNames* defined in OPC 40084-1. The namespace index is server specific.	Mandatory
http://opcfoundation.org/UA/PlasticsRubber/Extrusion/Extruder/	Namespace for *NodeIds* and *BrowseNames* defined in this specification. The namespace index is server specific.	Mandatory
Vendor specific types and instances	A server may provide vendor specific types like types derived from *MachineType* or *MachineStatusType* or vendor specific instances of devices in a vendor specific namespace.	Optional

Table 11 provides a list of namespaces and their index used for *BrowseNames* in this specification. The default namespace of this specification is not listed since all *BrowseNames* without prefix use this default namespace.

Table 11 – Namespaces used in this specification

NamespaceURI	Namespace Index	Example
http://opcfoundation.org/UA/	0	0:NodeVersion
http://opcfoundation.org/UA/DI/	2	2:DeviceClass
http://opcfoundation.org/UA/PlasticsRubber/GeneralTypes/	3	3:MachineInformationType
http://opcfoundation.org/UA/PlasticsRubber/Extrusion/GeneralTypes/	4	4:ExtrusionDeviceType

Annex A
(normative)

OPC 40084-3 Namespace and mappings

A.1 Namespace and identifiers for OPC 40084-3 Information Model

This appendix defines the numeric identifiers for all of the numeric *NodeIds* defined in this specification. The identifiers are specified in a CSV file with the following syntax:

```
<SymbolName>, <Identifier>, <NodeClass>
```

Where the *SymbolName* is either the *BrowseName* of a *Type Node* or the *BrowsePath* for an *Instance Node* that appears in the specification and the *Identifier* is the numeric value for the *NodeId*.

The *BrowsePath* for an *Instance Node* is constructed by appending the *BrowseName* of the instance *Node* to the *BrowseName* for the containing instance or type. An underscore character is used to separate each *BrowseName* in the path. Let's take for example, the *MachineInformationType ObjectType Node* which has the *ControllerName Property*. The **Name** for the *ControllerName InstanceDeclaration* within the *MachineInformationType* declaration is: *MachineInformationType_ControllerName*.

The *NamespaceUri* for all *NodeIds* defined here is http://opcfoundation.org/UA/PlasticsRubber/Extrusion/Extruder/

The CSV released with this version of the specification can be found here:

– http://www.opcfoundation.org/UA/schemas/PlasticsRubber/Extrusion/Extruder/1.00/NodeIds.csv

NOTE: The latest CSV that is compatible with this version of the specification can be found here:

– http://www.opcfoundation.org/UA/schemas/PlasticsRubber/Extrusion/Extruder/NodeIds.csv

A computer processible version of the complete Information Model defined in this specification is also provided. It follows the XML Information Model schema syntax defined in Part 6.

The Information Model Schema released with this version of the specification can be found here:

– http://www.opcfoundation.org/UA/schemas/PlasticsRubber/Extrusion/Extruder/1.00/Opc.Ua.PlasticsRubber.Extrusion.Extruder.NodeSet2.xml

NOTE: The latest Information Model schema that is compatible with this version of the specification can be found here:

– http://www.opcfoundation.org/UA/schemas/PlasticsRubber/Extrusion/Extruder/Opc.Ua.PlasticsRubber.Extrusion.Extruder.NodeSet2.xml

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