# Cutting Tool Asset

From the MTConnect specification version 1.2 Part 4 "Assets", an Asset is something that is associated with the manufacturing process that is not a component of a device, can be removed without detriment to the function of the device, and can be associated with other devices during their lifecycle. An asset does not have computational capabilities, but may carry information in some media physically attached to the asset. Concrete examples of Assets are things like Cutting Tools, Workholding Systems, and Fixtures. The Cutting Tool is the only asset type covered by the MTConnect Asset standard as of version 1.2.

A Cutting Tool is an assembly of items for removing material from a work-piece through a shearing action at the defined cutting edge or edges of the Cutting Item. A Cutting Tool can be a single item or an assembly of one or more Adaptive Items, a Tool Item and several Cutting Items on a Tool Item.MTConnect will adopt the ISO 13399 structure when formulating the vocabulary for cutting tools. MTConnect will focus on the application of the cutting tool and cutting items. At this time we are only concerned with two aspects of the cutting tool, the Cutting Tool and the Cutting Item. We will not be including the Tool Item, Adaptive Item, or the Assembly Items, as they are component parts of the cutting tool do not have a large impact on the use phase of the tool and will be sufficiently defined in the ISO 13399 portion of the document[[1]](#footnote-1).

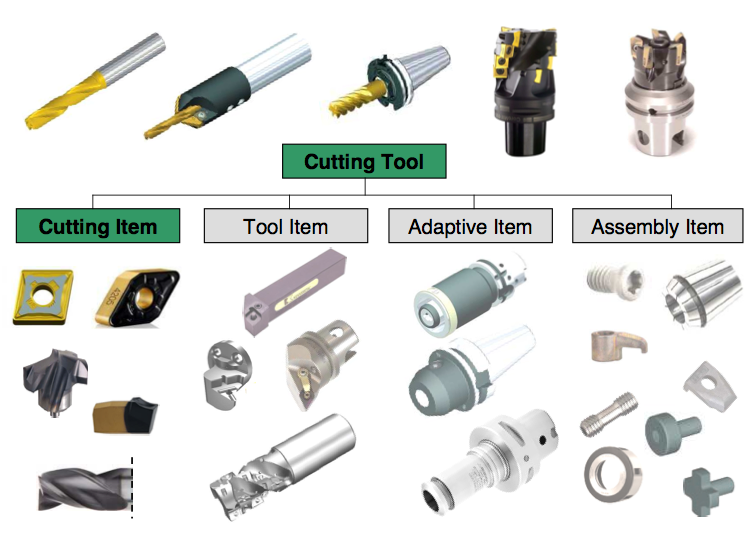


Figure Cutting Tool Parts

The previous diagram illustrates the parts of a cutting tool. The cutting tool is the aggregate of all the components and the cutting item is the part of the tool that removes the material from the workpiece. These are the primary focus of MTConnect.

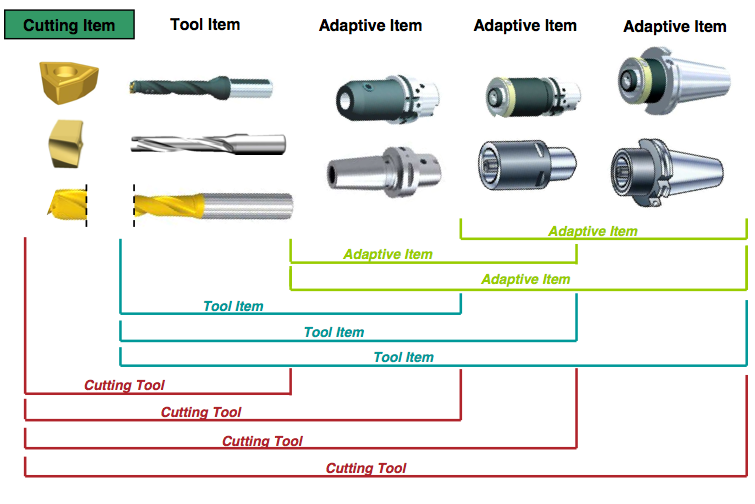


Figure : Cutting Tool Composition

Figure 3 provides another view of the cutting tool composition model. The adaptive items and tool items will be used for measurements, but will not be modeled as separate entities. The definitions will assume when referencing the cutting tool we are referring to the entirety of the asset and when we provide data regarding the cutting item we are referencing each individual component as illustrated on the left of the previous diagram.

Figures 4 and 5 further illustrates the components of the cutting tool. As we compose the Tool Item, Cutting Item, Adaptive Item, we get a Cutting Tool. The Tool Item and Assembly Item will only be in the CuttingToolDefinition section that will contain the full ISO 13399 information.

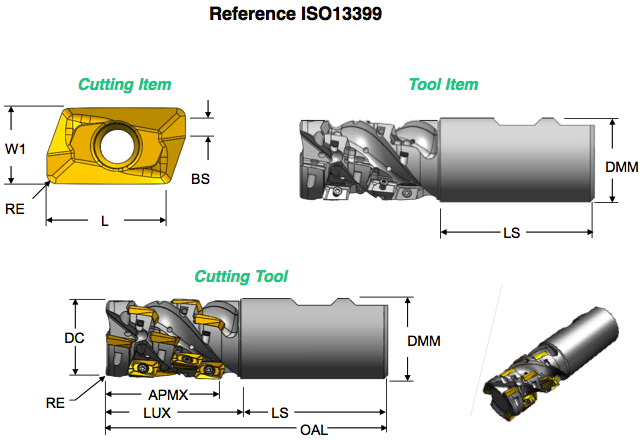


Figure : Cutting Tool, Tool Item and Cutting Item

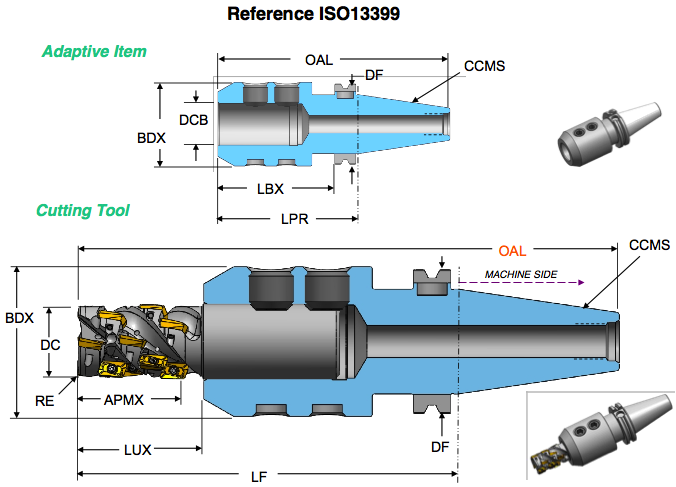


Figure : Cutting Tool, Tool Item and Cutting Item

The above diagrams use the ISO 13399 codes for each of the measurements. These codes will be translated into the MTConnect vocabulary as illustrated below. The measurements will have a maximum, minimum, and nominal value representing the tolerance of allowable values for this dimension. See below for a full discussion.

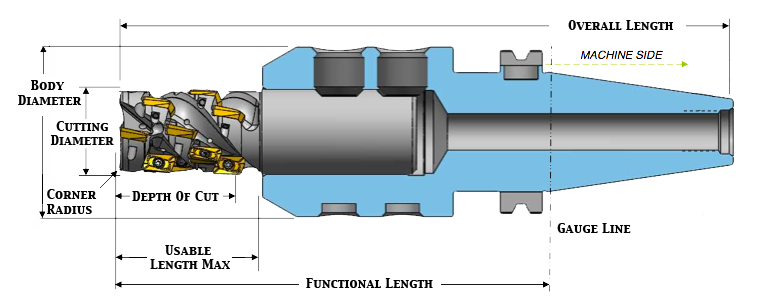


Figure 5: Cutting Tool Measurements

The MTConnect standard will not define the entire geometry of the cutting tool, but will provide the information necessary to use the tool in the manufacturing process. Additional information can be added to the definition of the cutting tool by means of schema extensions.

The following sections provide the mapping into OPC UA types, variables and folder objects.

## Simple Types

### AssetAttrType

An asset type

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetAttrType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### AssetBufferSizeType

The maximum number of assets

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetBufferSizeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### AssetCountAttrType

The number of assets

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetCountAttrType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### AssetIdType

The unique id of the asset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### BufferSizeType

The size of the agents buffer

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BufferSizeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### CodeType

A application specific code

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CodeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### ComponentIdType

The id of the component (maps to the id from probe)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ComponentIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of ID | | | | | |

### ConnectionCodeMachineSideType

The code for the connection to the machine

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ConnectionCodeMachineSideType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### CoordinateSystemType

Enumeration: CoordinateSystemTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| MACHINE\_1 | Unchangeable coordinate system that has machine zero as its origin. |
| WORK\_2 | The coordinate system that represents the working area for a particular workpiece whose origin is shifted within the MACHINE coordinate system. If the WORK coordinates are not currently defined in the device, the MACHINE coordinates will be used. |

The coordinate system to be used for the position

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CoordinateSystemType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### CreationTimeType

The date and time the document was created

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CreationTimeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of dateTime | | | | | |

### CutterStatusValueType

Enumeration: CutterStatusValueTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ALLOCATED\_1 |  |
| AVAILABLE\_2 |  |
| BROKEN\_3 |  |
| EXPIRED\_4 |  |
| MEASURED\_5 |  |
| NEW\_6 |  |
| NOT\_REGISTERED\_7 |  |
| RECONDITIONED\_8 |  |
| TAGGED\_OUT\_9 |  |
| UNALLOCATED\_10 |  |
| UNAVAILABLE\_11 | No data item reading for this device is avaiable. |
| UNKNOWN\_12 |  |
| USED\_13 |  |

The state of the tool. These can be combined to define the complete cutting tool state

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CutterStatusValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### DataItemEnumType

The types of measurements available

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemEnumType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of DataItemEnumTypeEnum | | | | | |
| Union of DataItemExtType | | | | | |

### DataItemEnumTypeEnum

Enumeration: DataItemEnumTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACCELERATION\_1 | Rate of change of velocity |
| ACCUMULATED\_TIME\_2 | The measurement of accumulated time associated with a component |
| ACTIVE\_AXES\_3 | The set of axes associated with a path that the controller is controlling. If this data item is not provided, it will be assumed the controller is controlling all axes. |
| ACTUATOR\_4 | An actuator related condition. |
| ACTUATOR\_STATE\_5 | The state of the actuator. ACTIVE or INACTIVE. |
| ALARM\_6 | DEPRECATED: Replaced with CONDITION category. Rel. 1.1. |
| AMPERAGE\_7 | The measurement of AC Current or a DC current. Subtypes: ALTERNATING The measurement of alternating current. If not specified further in Statistic, defaults to RMS Current units in AMPERE. DIRECT The measurement of DC current units in AMPERE. |
| ANGLE\_8 | The angular position of a component relative to the parent. ACTUAL The angular position as read from the physical component in units DEGREE. COMMANDED - The angular position computed by the controller in units DEGREE. |
| ANGULAR\_ACCELERATION\_9 | Rate of change of angular velocity. |
| ANGULAR\_VELOCITY\_10 | Rate of change of angular position. |
| ASSET\_CHANGED\_11 |  |
| AVAILABILITY\_12 | Represents the components ability to communicate its availability. This SHALL beprovided for the device and MAY be provided for all other components |
| AXIS\_COUPLING\_13 | Describes the way the axes will be associated to each other. This is used in conjunction with COUPLED\_AXES to indicate the way they are interacting. The possible values are: TANDEM, SYNCHRONOUS, MASTER, and SLAVE. The coupling SHALL be viewed from the perspective of the axis, therefore a MASTER coupling indicates that this axis is the master of the COUPLED\_AXES. |
| AXIS\_FEEDRATE\_14 | The feedrate of a linear axis. Subtypes: ACTUAL - The actual federate of a linear axis in units MILLIMETER/SECOND. OMMANDED - The feedrate as specified in the program in units MILLIMETER/SECOND. OVERRIDE - The operator’s overridden value. Percent of commanded in units PERCENT. |
| BLOCK\_15 | The block of code being executed. The block contains the entire expression of the step in the program. |
| CODE\_16 | DEPRECATED. Rel 1.1.0 |
| COMMUNICATIONS\_17 | A communications failure indicator. |
| CONCENTRATION\_18 | Percentage of one component within a mixture of components |
| CONDUCTIVITY\_19 | The ability of a material to conduct electricity |
| CONTROLLER\_MODE\_20 | The current controller’s mode. AUTOMATIC, MANUAL, MANUAL\_DATA\_INPUT, FEED\_HOLD, or SEMI\_AUTOMATIC. |
| COUPLED\_AXES\_21 | Refers to the set of associated axes. The value will be a space delimited set of axes names. |
| DIRECTION\_22 | The direction of motion. CLOCKWISE or COUNTER\_CLOCKWISE |
| DISPLACEMENT\_23 | The displacement as the change in position of an object |
| DOOR\_STATE\_24 | The opened or closed state of the door. OPEN, UNLATCHED, or CLOSED. |
| ELECTRICAL\_POWER\_25 |  |
| EMERGENCY\_STOP\_26 | The current state of the emergency stop actuator. ARMED (the circuit is complete and the device is operating) or TRIGGERED (the circuit is open and the device SHALL cease operation). |
| EXECUTION\_27 | The execution status of the Controller. READY, ACTIVE, INTERRUPTED, or STOPPED |
| FILL\_LEVEL\_28 | The measurement of the amount of a substance remaining compared to the planned maximum amount of that substance |
| FLOW\_29 | The rate of flow of a fluid |
| FREQUENCY\_30 | The measurement of the number of occurrences of a repeating event per unit time |
| HARDWARE\_31 | The hardware subsystem of the component operation condition. |
| LEVEL\_32 | Deprecated in Rel. 1.2 See Fill\_Level |
| LINE\_33 | The state of the high voltage line. |
| LINEAR\_FORCE\_34 | The measure of the push or pull introduced by an actuator or exerted on an object |
| LOAD\_35 | The measurement of the percentage of the standard rating of a device |
| LOGIC\_PROGRAM\_36 | An error occurred in the logic program or PLC (programmable logic controller). |
| MASS\_37 | The measurement of the mass of an object(s) or an amount of material |
| MESSAGE\_38 | An uninterpreted textual notification. |
| MOTION\_PROGRAM\_39 | An error occurred in the motion program. |
| PART\_COUNT\_40 | The current count of parts produced as represented by the controller. SHALL be an integer value.ALL The count of all the parts produced. If the subtype is not given, this is the default. GOOD Indicates the count of correct parts made. BAD Indicates the count of incorrect parts produced. |
| PART\_ID\_41 | An identifier of the current part in the device |
| PATH\_FEEDRATE\_42 | The feedrate of the tool path. Subtypes: ACTUAL - The three-dimensional feedrate derived from all components in units MILLIMETER/SECOND. COMMANDED - The feedrate as specified in the program in units MILLIMETER/SECOND. OVERRIDE - The operator’s overridden value. Percent of commanded in unitsPERCENT. |
| PATH\_MODE\_43 | The operational mode for this Path. SYNCHRONOUS, MIRROR, or INDEPENDENT. Default value is INDEPENDENT if not specified. |
| PATH\_POSITION\_44 | The current program control point or program coordinate in WORK coordinates. The coordinate system will revert to MACHINE coordinates if WORK coordinates are not available. ACTUAL The position of the component as read from the device in units MILLIMETER\_3D. COMMANDEDThe position computed by the controller in units MILLIMETER\_3D. TARGET The target position for the movement in units MILLIMETER\_3D. PROBE The position provided by a probe in units MILLIMETER\_3D. |
| PH\_45 | A measure of the acidity or alkalinity of a solution |
| POSITION\_46 | The position of the component. Defaults to MACHINE coordinates. Subtypes: ACTUAL-The position of the component as read from the device in units MILLIMETER. COMMANDED- The position as given by the Controller in units MILLIMETER. TARGET- The target position for the movement in units - MILLIMETER. |
| POWER\_FACTOR\_47 | The measurement of the ratio of real power flowing to a load to the apparent power in that AC circuit. |
| POWER\_STATE\_48 | The ON or OFF status of the component. DEPRECATION WARNING: MAY bedeprecated in the future. |
| POWER\_STATUS\_49 | DEPRECATED. Rel. 1.1. |
| PRESSURE\_50 | The force per unit area exerted by a gas or liquid |
| PROGRAM\_51 | The name of the program being executed |
| RESET\_52 |  |
| RESISTANCE\_53 | The measurement of the degree to which an object opposes an electric current through it |
| ROTARY\_MODE\_54 | The mode for the Rotary axis. SPINDLE, INDEX, or CONTOUR. |
| ROTARY\_VELOCITY\_55 | The rotational speed of a rotary axis. ACTUAL The rotational speed the rotary axis is spinning at. ROTARY\_MODE SHALL be SPINDLE in units REVOLUTION/MINUTE COMMANDED The rotational speed as specified in the program in units REVOLUTION/MINUTE. OVERRIDE The operator’s overridden value. Percent of commanded in units PERCENT. |
| SOUND\_PRESSURE\_56 |  |
| SPINDLE\_SPEED\_57 | DEPRECATED in REL 1.2. Replaced by ROTARY\_VELOCITY |
| STRAIN\_58 | Strain is the amount of deformation per unit length of an object when a load is applied. |
| SYSTEM\_59 | A condition representing something that is not the operator, program, or hardware. This is often used for operating system issues. |
| TEMPERATURE\_60 | The measurement of temperature |
| TILT\_61 | A measurement of angular displacement |
| TOOL\_ASSET\_ID\_62 | The identifier of the tool currently in use for a given Path |
| TORQUE\_63 | The turning force exerted on an object or by an object |
| VELOCITY\_64 | The rate of change of position. |
| VIBRATION\_65 |  |
| VISCOSITY\_66 | A measurement of a fluid’s resistance to flow |
| VOLTAGE\_67 | The measurement of electrical potential between two points |
| VOLT\_AMPERE\_68 | Volt-Ampere (VA) |
| VOLT\_AMPERE\_REACTIVE\_69 | Volt-Ampere Reactive (var) |
| WATTAGE\_70 | The measurement of power consumed or dissipated by an electrical circuit or device |
| WATT\_SECOND\_71 | Measurement of electrical energy, equal to one Joule |
| WORKHOLDING\_ID\_72 | The identifier for the workholding currently in use for a given Path |

The types of measurements available

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemEnumTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### DataItemExtType

An extension point for data item types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemExtType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### DataItemStatisticsType

Statistical operations on data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemStatisticsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of DataItemStatisticsTypeEnum | | | | | |
| Union of DataItemStatsExtType | | | | | |

### DataItemStatisticsTypeEnum

Enumeration: DataItemStatisticsTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AVERAGE\_1 | Mathematical Average value calculated for the DataItem during the calculation period |
| KURTOSIS\_2 | A measure of the “peakedness” of a probability distribution; i.e., the shape of the distribution curve |
| MAXIMUM\_3 | Maximum or peak value recorded for the DataItem during the calculation period |
| MEAN\_4 |  |
| MINIMUM\_5 | Minimum value recorded for the DataItem during the calculation period |
| MODE\_6 | The number in a series of numbers that occurs most often |
| RANGE\_7 | Difference between the Maximum value and Minimum value of a DataItem during the calculation period. Also represents Peak-to-Peak measurement in an waveform. |
| ROOT\_MEAN\_SQUARE\_8 | Mathematical Root Mean Value (RMS) value calculated for the DataItem during the calculation period |
| STANDARD\_DEVIATION\_9 | Statistical Standard Deviation value calculated for the DataItem during the calculation period |

Statistical operations on data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemStatisticsTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### DataItemStatsExtType

An extension point for data item statistics types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemStatsExtType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### DataItemSubEnumType

The sub-types for a measurement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemSubEnumType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of DataItemExtType | | | | | |
| Union of DataItemSubEnumTypeEnum | | | | | |

### DataItemSubEnumTypeEnum

Enumeration: DataItemSubEnumTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACTUAL\_1 | The value of the component as read from the device. |
| ALL\_2 |  |
| ALTERNATING\_3 | The measurement of alternating voltage. If not specified further in Statistic, defaults to RMS voltage |
| A\_SCALE\_4 | A Scale weighting factor. This is the default weighting factor if no factor is specified |
| BAD\_5 |  |
| B\_SCALE\_6 | B Scale weighting factor |
| COMMANDED\_7 | The value computed by the controller. |
| CONTROL\_8 | The state of the low power line. |
| C\_SCALE\_9 | C Scale weighting factor |
| DIRECT\_10 | The measurement of DC voltage |
| DYNAMIC\_11 |  |
| D\_SCALE\_12 | D Scale weighting factor |
| GOOD\_13 |  |
| KINETIC\_14 |  |
| LINE\_15 | The state of the high voltage line. |
| MAXIMUM\_16 | Maximum or peak value recorded for the DataItem during the calculation period |
| MINIMUM\_17 | Minimum value recorded for the DataItem during the calculation period |
| MOLE\_18 |  |
| NO\_SCALE\_19 | No weighting factor on the frequency scale |
| OTHER\_20 | Unsupported units |
| OVERRIDE\_21 | The operator’s overridden value. Percent of commanded. |
| PROBE\_22 | The value provided by a probe |
| TARGET\_23 | The target value for the movement. |
| VOLUME\_24 |  |
| WEIGHT\_25 |  |

The sub-types for a measurement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemSubEnumTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### DefinitionFormatType

Enumeration: DefinitionFormatTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| EXPRESS\_1 |  |
| TEXT\_2 |  |
| UNDEFINED\_3 |  |
| XML\_4 |  |

The format of the definition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DefinitionFormatType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### DescriptionTextType

A description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DescriptionTextType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### EdgeCountType

The number of cutting edges

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | EdgeCountType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### GradeType

The material for a cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | GradeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### IDType

An identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | IDType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of ID | | | | | |

### IndexRangeType

A single or range of indexes. A range can be a comma separated set of individual elements as in "1,2,3,4", or as a inclusive range of values as in "1-10" or multiple ranges "1-4,6-10"

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | IndexRangeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### InstanceIdType

The instance number of the agent, used for fault tolerance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | InstanceIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### ItemIdType

An identifier for the insert

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ItemIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of NMTOKEN | | | | | |

### ItemSourceType

The measurement source

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ItemSourceType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### LocationSizeType

The number of location units required to hold this tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LocationSizeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### LocationValueType

The tool location

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LocationValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### LocationsType

Enumeration: LocationsTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CRIB\_1 |  |
| POT\_2 |  |
| STATION\_3 |  |

The type of tool location

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LocationsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### LocusType

The location of the cutting item - not yet restricted.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LocusType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### ManufacturersType

A comman delimited list of manufactures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ManufacturersType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### MaximumCountType

A maximum count value

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MaximumCountType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### MaximumType

A maximum value

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MaximumType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### MeasurementValueType

A measurement value

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MeasurementValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### MinimumType

A minimum value

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MinimumType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### NameType

A short name for any element

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NameType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### NativeUnitsType

The units supported for the source equipment that can be converted into MTC Units.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeUnitsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of NativeUnitsTypeEnum | | | | | |
| Union of UnitsExtType | | | | | |

### NativeUnitsTypeEnum

Enumeration: NativeUnitsTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AMPERE\_1 | Amps |
| CELSIUS\_2 | Degrees Celsius |
| CENTIPOISE\_3 | A measure of Viscosity |
| COUNT\_4 | A counted event |
| DECIBEL\_5 | Sound Level |
| DEGREE\_6 | Angle in degrees |
| DEGREE/MINUTE\_7 | Rotational velocity in degrees per minute |
| DEGREE/SECOND\_8 | Angular degrees per second |
| DEGREE/SECOND^2\_9 | Angular acceleration in degrees per second squared |
| FAHRENHEIT\_10 | Temperature in Fahrenheit |
| FOOT\_11 | Feet |
| FOOT/MINUTE\_12 | Feet per minute |
| FOOT/SECOND\_13 | Feet per second |
| FOOT/SECOND^2\_14 | Acceleration in feet per second squared |
| FOOT\_3D\_15 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in feet. |
| GALLON/MINUTE\_16 | Gallons per minute. |
| HERTZ\_17 | Frequency measured in cycles per second |
| INCH\_18 | Inches |
| INCH/MINUTE\_19 | Inches per minute |
| INCH/SECOND\_20 | Inches per second |
| INCH/SECOND^2\_21 | Acceleration in inches per second squared |
| INCH\_3D\_22 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in inches. |
| JOULE\_23 | A measurement of energy. |
| KILOGRAM\_24 | Kilograms |
| KILOWATT\_25 | A measurement in kilowatt. |
| KILOWATT\_HOUR\_26 | Kilowatt hours which is 3.6 mega joules. |
| LITER\_27 | Liters |
| LITER/SECOND\_28 | Liters per second |
| MICRO\_RADIAN\_29 | Measurement of Tilt |
| MILLIMETER\_30 | Millimeters |
| MILLIMETER/MINUTE\_31 | Velocity in millimeters per minute |
| MILLIMETER/SECOND\_32 | Millimeters per second |
| MILLIMETER/SECOND^2\_33 | Acceleration in millimeters per second squared |
| MILLIMETER\_3D\_34 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in millimeters. |
| NEWTON\_35 | Force in Newtons |
| NEWTON\_METER\_36 | Torque, a unit for force times distance. |
| OHM\_37 | Measure of Electrical Resistance |
| OTHER\_38 | Unsupported units |
| PASCAL\_39 | Pressure in Newtons per square meter |
| PASCAL\_SECOND\_40 | Measurement of Viscosity |
| PERCENT\_41 | Percentage |
| PH\_42 | A measure of the acidity or alkalinity of a solution |
| POUND\_43 | US pounds |
| POUND/INCH^2\_44 | Pressure in pounds per square inch (PSI). |
| RADIAN\_45 |  |
| RADIAN/MINUTE\_46 | Velocity in radians per second. |
| RADIAN/SECOND\_47 | Velocity in radians per second |
| RADIAN/SECOND^2\_48 | Rotational acceleration in radian per second squared |
| REVOLUTION/MINUTE\_49 | Revolutions per minute |
| REVOLUTION/SECOND\_50 | Rotational velocity in revolution per second |
| SECOND\_51 | A measurement of time. |
| SIEMENS/METER\_52 | A measurement of Electrical Conductivity |
| SOUND\_LEVEL\_53 | Measurement of a sound level or sound pressure level relative to atmospheric pressure. Subtypes: NO\_SCALE - No weighting factor on the frequency scale in DECIBEL. A\_SCALE A Scale weighting factor. This is the default weighting factor if no factor is specified in DECIBEL. B\_SCALE- B Scale weighting factor in DECIBEL. C\_SCALE C Scale weighting factor in DECIBEL. D\_SCALE D Scale weighting factor in DECIBEL. |
| VOLT\_54 | Volts |
| VOLT\_AMPERE\_55 | Volt-Ampere (VA) |
| VOLT\_AMPERE\_REACTIVE\_56 | Volt-Ampere Reactive (var) |
| WATT\_57 | Watts |
| WATT\_SECOND\_58 | Measurement of electrical energy, equal to one Joule |

The units supported for the source equipment that can be converted into MTC Units.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeUnitsTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### NominalType

A nominal value

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NominalType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### OccurrenceTimeType

The time a sample occurred

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | OccurrenceTimeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of dateTime | | | | | |

### OverlapType

The number of additional locations taken by a tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | OverlapType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### ProgramToolNumberType

The number referenced in the program for this tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ProgramToolNumberType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### RateType

A sample rate in milliseconds per sample

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | RateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### ReconditionCountValueType

The number of times the cutter has been reconditioned

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ReconditionCountValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### SenderType

The sender of the message

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SenderType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### SequenceType

A sequence number

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SequenceType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### SerialNumberType

A serial number for a piece of equipment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SerialNumberType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### SignificantDigitsValueType

The number significant digits

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SignificantDigitsValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

### SpeedType

A speed in RPM or mm/s

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SpeedType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### TestIndicatorType

A debugging flag for testing.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TestIndicatorType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of boolean | | | | | |

### TimestampType

The time the sample was reported

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TimestampType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of dateTime | | | | | |

### ToolGroupType

The tool group associated with the tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolGroupType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### ToolIdType

The identifier of the tool type

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of NMTOKEN | | | | | |

### ToolLifeDirectionType

Enumeration: ToolLifeDirectionTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| DOWN\_1 |  |
| UP\_2 |  |

The direction of tool life count

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolLifeDirectionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### ToolLifeType

Enumeration: ToolLifeTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| MINUTES\_1 |  |
| PART\_COUNT\_2 | The current count of parts produced as represented by the controller. SHALL be an integer value.ALL The count of all the parts produced. If the subtype is not given, this is the default. GOOD Indicates the count of correct parts made. BAD Indicates the count of incorrect parts produced. |
| WEAR\_3 |  |

The direction of tool life count

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolLifeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### ToolLifeValueType

The life of the tool in time, wear, or parts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolLifeValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

### UnitsExtType

An extension point for data item types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UnitsExtType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### UnitsType

The units supported

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UnitsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of UnitsExtType | | | | | |
| Union of UnitsTypeEnum | | | | | |

### UnitsTypeEnum

Enumeration: UnitsTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AMPERE\_1 | Amps |
| CELSIUS\_2 | Degrees Celsius |
| COUNT\_3 | A counted event |
| DECIBEL\_4 | Sound Level |
| DEGREE\_5 | Angle in degrees |
| DEGREE/SECOND\_6 | Angular degrees per second |
| DEGREE/SECOND^2\_7 | Angular acceleration in degrees per second squared |
| HERTZ\_8 | Frequency measured in cycles per second |
| JOULE\_9 | A measurement of energy. |
| KILOGRAM\_10 | Kilograms |
| LITER\_11 | Liters |
| LITER/SECOND\_12 | Liters per second |
| MICRO\_RADIAN\_13 | Measurement of Tilt |
| MILLIMETER\_14 | Millimeters |
| MILLIMETER/SECOND\_15 | Millimeters per second |
| MILLIMETER/SECOND^2\_16 | Acceleration in millimeters per second squared |
| MILLIMETER\_3D\_17 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in millimeters. |
| NEWTON\_18 | Force in Newtons |
| NEWTON\_METER\_19 | Torque, a unit for force times distance. |
| OHM\_20 | Measure of Electrical Resistance |
| PASCAL\_21 | Pressure in Newtons per square meter |
| PASCAL\_SECOND\_22 | Measurement of Viscosity |
| PERCENT\_23 | Percentage |
| PH\_24 | A measure of the acidity or alkalinity of a solution |
| REVOLUTION/MINUTE\_25 | Revolutions per minute |
| SECOND\_26 | A measurement of time. |
| SIEMENS/METER\_27 | A measurement of Electrical Conductivity |
| SOUND\_LEVEL\_28 | Measurement of a sound level or sound pressure level relative to atmospheric pressure. Subtypes: NO\_SCALE - No weighting factor on the frequency scale in DECIBEL. A\_SCALE A Scale weighting factor. This is the default weighting factor if no factor is specified in DECIBEL. B\_SCALE- B Scale weighting factor in DECIBEL. C\_SCALE C Scale weighting factor in DECIBEL. D\_SCALE D Scale weighting factor in DECIBEL. |
| VOLT\_29 | Volts |
| VOLT\_AMPERE\_30 | Volt-Ampere (VA) |
| VOLT\_AMPERE\_REACTIVE\_31 | Volt-Ampere Reactive (var) |
| WATT\_32 | Watts |
| WATT\_SECOND\_33 | Measurement of electrical energy, equal to one Joule |

The units supported

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UnitsTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

### UuidType

A universally unique id that uniquely identifies the element for it's entire life

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UuidType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

### VersionType

A version number

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VersionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of NMTOKEN | | | | | |

## Complex Types

### AssemblyMeasurementType

Measurements for the assembly

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssemblyMeasurementType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [MeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementType) | | | | | |

### AssemblyMeasurementsType

A collection of assembly measurements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssemblyMeasurementsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |

### AssetDescriptionType

The description of an asset, can be freeform text or elemenrts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetDescriptionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |

### AssetType

An abstract mobile asset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasProperty | Variable | assetId | [AssetIdType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetIdType) | ProperyType | Mandatory |
| HasProperty | Variable | serialNumber | [SerialNumberType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#SerialNumberType) | ProperyType | Mandatory |
| HasProperty | Variable | manufacturers | [ManufacturersType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ManufacturersType) | ProperyType | Optional |
| HasProperty | Variable | timestamp | [TimestampType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#TimestampType) | ProperyType | Mandatory |
| HasComponent | Object | Description | [AssetDescriptionType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetDescriptionType) | FolderType | Optional(0..1) |

### AssetsType

The collection of mobile assets

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |

### BodyDiameterMaxType

BDX: The largest diameter of the body of a tool item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BodyDiameterMaxType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### BodyLengthMaxType

LBX: The distance measured along the X axis from that point of the item closest to the workpiece, including the cutting item for a tool item but excluding a protuding locking mechanism for an adaptive item, to either the front of the flange on a flanged body or the beginning of the connection interface feature on the machine side for cylindrical or prismatic shanks

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BodyLengthMaxType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### CommonMeasurementType

Measurements for both the assembly and the cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CommonMeasurementType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [MeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementType) | | | | | |

### CornerRadiusType

nominal radius of a rounded corner measured in the XY-plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CornerRadiusType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### CutterStatusType

The set of applicatable status for this cutting tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CutterStatusType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object | Status | [CutterStatusValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CutterStatusValueType) | FolderType | Mandatory(1..unbounded) |

### CuttingDiameterMaxType

DC: The maximum diameter of a circle on which the defined point Pk of each of the master inserts is located on a tool item. The normal of the machined peripheral surface points towards the axis of the cutting tool.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingDiameterMaxType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### CuttingDiameterType

diameter of a circle on which the defined point Pk of each of the master inserts is located on a tool item. The normal of the machined peripheral surface points towards the axis of the cutting tool.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingDiameterType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### CuttingEdgeLengthType

theoretical length of the cutting edge of a cutting item over sharp corners

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingEdgeLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### CuttingHeightType

theoretical length of the cutting edge of a cutting item over sharp corners

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingHeightType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### CuttingItemMeasurementType

Measurements for the cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingItemMeasurementType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [MeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementType) | | | | | |

### CuttingItemMeasurementsType

A collection of assembly measurements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingItemMeasurementsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |

### CuttingItemType

An edge into a tool assembly

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingItemType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasProperty | Variable | indices | [IndexRangeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#IndexRangeType) | ProperyType | Mandatory |
| HasProperty | Variable | itemId | [ItemIdType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ItemIdType) | ProperyType | Optional |
| HasProperty | Variable | grade | [GradeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#GradeType) | ProperyType | Optional |
| HasProperty | Variable | manufacturers | [ManufacturersType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ManufacturersType) | ProperyType | Optional |
| HasComponent | Object | Description | [AssetDescriptionType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetDescriptionType) | FolderType | Optional(0..1) |
| HasComponent | Object | Locus | [LocusType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#LocusType) | FolderType | Optional(0..1) |
| HasComponent | Object | ItemLife | [LifeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#LifeType) | FolderType | Optional(0..1) |
| HasComponent | Object | Measurements | [CuttingItemMeasurementsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementsType) | FolderType | Optional(0..1) |

### CuttingItemsType

A list of edge

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingItemsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasProperty | Variable | count | [EdgeCountType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#EdgeCountType) | ProperyType | Mandatory |
| HasComponent | Object | CuttingItem | [CuttingItemType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemType) | FolderType | Mandatory(1..unbounded) |

### CuttingReferencePoiintType

the theoretical sharp point of the cutting tool from which the major functional dimensions are taken

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingReferencePoiintType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### CuttingToolDefinitionType

The description of an asset, can be freeform text or elemenrts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingToolDefinitionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasProperty | Variable | format | [DefinitionFormatType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#DefinitionFormatType) | ProperyType | Optional |

### CuttingToolLifeCycleType

A defintion of a cutting tool application and life cycle

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingToolLifeCycleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object | CutterStatus | [CutterStatusType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CutterStatusType) | FolderType | Mandatory(1..0) |
| HasComponent | Object | ReconditionCount | [ReconditionCountType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ReconditionCountType) | FolderType | Optional(0..1) |
| HasComponent | Object | ToolLife | [LifeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#LifeType) | FolderType | Optional(0..1) |
| HasComponent | Object | ProgramToolNumber | [ProgramToolNumberType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ProgramToolNumberType) | FolderType | Optional(0..1) |
| HasComponent | Object | Location | [LocationType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#LocationType) | FolderType | Optional(0..1) |
| HasComponent | Object | ProgramSpindleSpeed | [ProgramSpindleSpeedType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ProgramSpindleSpeedType) | FolderType | Optional(0..1) |
| HasComponent | Object | ProgramFeedRate | [ProgramFeedRateType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ProgramFeedRateType) | FolderType | Optional(0..1) |
| HasComponent | Object | ConnectionCodeMachineSide | [ConnectionCodeMachineSideType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ConnectionCodeMachineSideType) | FolderType | Optional(0..1) |
| HasComponent | Object | Measurements | [AssemblyMeasurementsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementsType) | FolderType | Optional(0..1) |
| HasComponent | Object | CuttingItems | [CuttingItemsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemsType) | FolderType | Optional(0..1) |

### CuttingToolType

A cutting tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingToolType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssetType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetType) | | | | | |
| HasProperty | Variable | deviceUuid | [UuidType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#UuidType) | ProperyType | Optional |
| HasProperty | Variable | toolId | [ToolIdType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolIdType) | ProperyType | Mandatory |
| HasProperty | Variable | toolGroup | [ToolGroupType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolGroupType) | ProperyType | Optional |

### DepthOfCutMaxType

APMX: The maximum engagement of the cutting edge or edges with the workpiece measured perpendicular to the feed motion.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DepthOfCutMaxType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### DriveAngleType

Angle between the driving mechanism locator on a tool item and the main cutting edge.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DriveAngleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [xs:string](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#xs:string) | | | | | |

### FlangeDiameterMaxType

The maxumum dimension between two parallel tangents on the outside edge of a flange

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FlangeDiameterMaxType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### FlangeDiameterType

dimension between two parallel tangents on the outside edge of a flange

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FlangeDiameterType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### FunctionalLengthType

LF: The furthest distance from the gauge plane.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FunctionalLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CommonMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurementType) | | | | | |

### FunctionalWidthType

distance between the cutting reference point and the rear backing surface of a turning tool or the axis of a boring bar

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FunctionalWidthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### HeaderType

Message header for protocol information

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | HeaderType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [xs:string](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#xs:string) | | | | | |
| HasProperty | Variable | version | [VersionType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#VersionType) | ProperyType | Mandatory |
| HasProperty | Variable | creationTime | [CreationTimeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CreationTimeType) | ProperyType | Mandatory |
| HasProperty | Variable | testIndicator | [TestIndicatorType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#TestIndicatorType) | ProperyType | Optional |
| HasProperty | Variable | instanceId | [InstanceIdType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#InstanceIdType) | ProperyType | Mandatory |
| HasProperty | Variable | sender | [SenderType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#SenderType) | ProperyType | Mandatory |
| HasProperty | Variable | assetBufferSize | [AssetBufferSizeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetBufferSizeType) | ProperyType | Mandatory |
| HasProperty | Variable | assetCount | [AssetCountAttrType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetCountAttrType) | ProperyType | Mandatory |

### InclinationAngleType

angle between the tool rake plane and a plane parallel to the xy-plane measured in the tool cutting edge plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | InclinationAngleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### IncribedCircleDiameterType

diameter of a circle to which all edges of a equilateral and round regular insert are tangental

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | IncribedCircleDiameterType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### LifeType

Abstract cutter life

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LifeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [ToolLifeValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolLifeValueType) | | | | | |
| HasProperty | Variable | type | [ToolLifeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolLifeType) | ProperyType | Mandatory |
| HasProperty | Variable | countDirection | [ToolLifeDirectionType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolLifeDirectionType) | ProperyType | Mandatory |
| HasProperty | Variable | warningLevel | [ToolLifeValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolLifeValueType) | ProperyType | Optional |
| HasProperty | Variable | maximum | [ToolLifeValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolLifeValueType) | ProperyType | Mandatory |

### LocationType

The location of the tool in the tool changer (pot) or the station of the tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LocationType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [LocationValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#LocationValueType) | | | | | |
| HasProperty | Variable | type | [LocationsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#LocationsType) | ProperyType | Mandatory |
| HasProperty | Variable | negativeOverlap | [OverlapType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#OverlapType) | ProperyType | Mandatory |
| HasProperty | Variable | positiveOverlap | [OverlapType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#OverlapType) | ProperyType | Mandatory |

### MTConnectAssetsType

The root node for MTConnect

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MTConnectAssetsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object | Header | [HeaderType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#HeaderType) | FolderType | Optional(0..0) |
| HasComponent | Object | Assets | [AssetsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetsType) | FolderType | Optional(0..0) |

### MeasurementType

An abstract type for edge measurements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MeasurementType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [MeasurementValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementValueType) | | | | | |
| HasProperty | Variable | significantDigits | [SignificantDigitsValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#SignificantDigitsValueType) | ProperyType | Optional |
| HasProperty | Variable | units | [UnitsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#UnitsType) | ProperyType | Optional |
| HasProperty | Variable | nativeUnits | [NativeUnitsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#NativeUnitsType) | ProperyType | Optional |
| HasProperty | Variable | code | [CodeType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CodeType) | ProperyType | Optional |
| HasProperty | Variable | maximum | [MeasurementValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementValueType) | ProperyType | Optional |
| HasProperty | Variable | minimum | [MeasurementValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementValueType) | ProperyType | Optional |
| HasProperty | Variable | nominal | [MeasurementValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementValueType) | ProperyType | Optional |

### OverallToolLengthType

OAL: largest length dimension of the tool item including the master insert where applicable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | OverallToolLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### PointAngleType

angle between the major cutting edge and the same cutting edge rotated by 180 degrees about the tool axis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PointAngleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### ProgramFeedRateType

The feed rate properties of this tool in MILLIMETERS/SECOND

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ProgramFeedRateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [SpeedType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#SpeedType) | | | | | |
| HasProperty | Variable | maximum | [MaximumType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MaximumType) | ProperyType | Optional |
| HasProperty | Variable | minimum | [MinimumType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MinimumType) | ProperyType | Optional |
| HasProperty | Variable | nominal | [NominalType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#NominalType) | ProperyType | Optional |

### ProgramSpindleSpeedType

The spindle speed properties of this tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ProgramSpindleSpeedType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [SpeedType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#SpeedType) | | | | | |
| HasProperty | Variable | maximum | [MaximumType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MaximumType) | ProperyType | Optional |
| HasProperty | Variable | minimum | [MinimumType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MinimumType) | ProperyType | Optional |
| HasProperty | Variable | nominal | [NominalType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#NominalType) | ProperyType | Optional |

### ProtrudingLengthType

dimension from the yz-plane to the furthest point of the tool item or adaptive item measured in the -X direction

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ProtrudingLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CommonMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurementType) | | | | | |

### ReconditionCountType

The number of times this tool has been reconditioned

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ReconditionCountType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [ReconditionCountValueType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ReconditionCountValueType) | | | | | |
| HasProperty | Variable | maximumCount | [MaximumCountType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MaximumCountType) | ProperyType | Optional |

### ShankDiameterType

DMM: dimension of the diameter of a cylindrical portion of a tool item or an adaptive item that can participate in a connection

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ShankDiameterType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### ShankHeightType

H: dimension of the height of a shank

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ShankHeightType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### ShankLengthType

LS: dimension of the length of a shank

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ShankLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### StepDiameterLengthType

length of a portion of a cutting tool that is related to the corresponding cutting diameter. The length is measured from the point "PK" of the corresponging diameter to the next projected point where the diameter starts to change

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | StepDiameterLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### StepIncludedAngleType

angle between a major edge on a step of a stepped tool and the same cutting edge rotated 180 degrees about ist tool axis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | StepIncludedAngleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### ToolCuttingEdgeAngleType

angle between the tool cutting edge plane and the tool feed plane measured in a plane parallel the xy-plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolCuttingEdgeAngleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### ToolLeadAngleType

angle between the tool cutting edge plane and a plane perpendicular to the tool feed plane measured in a plane parallel the xy-plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolLeadAngleType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### ToolOrientationType

The orientation as expressed in degrees of the cutting item to the workpiece for this process.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolOrientationType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [xs:string](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#xs:string) | | | | | |

### UsableLengthMaxType

The maximum length of a cutting tool that can be used in a particular cutting operation including the non-cutting portions of the tool.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UsableLengthMaxType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### WeightType

WT: The weight measured in grams

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | WeightType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CommonMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurementType) | | | | | |

### WiperEdgeLengthType

measure of the length of a wiper edge of a cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | WiperEdgeLengthType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

## OPC UA Variable Types

### AssemblyMeasurement

Measurements for the assembly

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssemblyMeasurement | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [Measurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#Measurement) | | | | | |
| Is a type [AssemblyMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurementType) | | | | | |

### Asset

An abstract mobile asset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Asset | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a type [AssetType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssetType) | | | | | |

### BodyDiameterMax

BDX: The largest diameter of the body of a tool item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BodyDiameterMax | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [BodyDiameterMaxType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#BodyDiameterMaxType) | | | | | |

### BodyLengthMax

LBX: The distance measured along the X axis from that point of the item closest to the workpiece, including the cutting item for a tool item but excluding a protuding locking mechanism for an adaptive item, to either the front of the flange on a flanged body or the beginning of the connection interface feature on the machine side for cylindrical or prismatic shanks

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BodyLengthMax | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [BodyLengthMaxType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#BodyLengthMaxType) | | | | | |

### CommonMeasurement

Measurements for both the assembly and the cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CommonMeasurement | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [Measurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#Measurement) | | | | | |
| Is a type [CommonMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurementType) | | | | | |

### CornerRadius

nominal radius of a rounded corner measured in the XY-plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CornerRadius | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [CornerRadiusType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CornerRadiusType) | | | | | |

### CuttingDiameter

diameter of a circle on which the defined point Pk of each of the master inserts is located on a tool item. The normal of the machined peripheral surface points towards the axis of the cutting tool.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingDiameter | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [CuttingDiameterType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingDiameterType) | | | | | |

### CuttingDiameterMax

DC: The maximum diameter of a circle on which the defined point Pk of each of the master inserts is located on a tool item. The normal of the machined peripheral surface points towards the axis of the cutting tool.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingDiameterMax | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [CuttingDiameterMaxType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingDiameterMaxType) | | | | | |

### CuttingEdgeLength

theoretical length of the cutting edge of a cutting item over sharp corners

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingEdgeLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [CuttingEdgeLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingEdgeLengthType) | | | | | |

### CuttingHeight

theoretical length of the cutting edge of a cutting item over sharp corners

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingHeight | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [CuttingHeightType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingHeightType) | | | | | |

### CuttingItemMeasurement

Measurements for the cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingItemMeasurement | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [Measurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#Measurement) | | | | | |
| Is a type [CuttingItemMeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurementType) | | | | | |

### CuttingReferencePoiint

the theoretical sharp point of the cutting tool from which the major functional dimensions are taken

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingReferencePoiint | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [CuttingReferencePoiintType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingReferencePoiintType) | | | | | |

### CuttingTool

A cutting tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CuttingTool | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [Asset](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#Asset) | | | | | |
| Is a type [CuttingToolType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingToolType) | | | | | |

### DepthOfCutMax

APMX: The maximum engagement of the cutting edge or edges with the workpiece measured perpendicular to the feed motion.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DepthOfCutMax | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [DepthOfCutMaxType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#DepthOfCutMaxType) | | | | | |

### FlangeDiameter

dimension between two parallel tangents on the outside edge of a flange

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FlangeDiameter | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [FlangeDiameterType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#FlangeDiameterType) | | | | | |

### FlangeDiameterMax

The maxumum dimension between two parallel tangents on the outside edge of a flange

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FlangeDiameterMax | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [FlangeDiameterMaxType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#FlangeDiameterMaxType) | | | | | |

### FunctionalLength

LF: The furthest distance from the gauge plane.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FunctionalLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CommonMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurement) | | | | | |
| Is a type [FunctionalLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#FunctionalLengthType) | | | | | |

### FunctionalWidth

distance between the cutting reference point and the rear backing surface of a turning tool or the axis of a boring bar

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FunctionalWidth | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [FunctionalWidthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#FunctionalWidthType) | | | | | |

### InclinationAngle

angle between the tool rake plane and a plane parallel to the xy-plane measured in the tool cutting edge plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | InclinationAngle | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [InclinationAngleType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#InclinationAngleType) | | | | | |

### IncribedCircleDiameter

diameter of a circle to which all edges of a equilateral and round regular insert are tangental

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | IncribedCircleDiameter | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [IncribedCircleDiameterType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#IncribedCircleDiameterType) | | | | | |

### MTConnectAssets

The root node for MTConnect

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MTConnectAssets | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a type [MTConnectAssetsType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MTConnectAssetsType) | | | | | |

### Measurement

An abstract type for edge measurements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Measurement | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a type [MeasurementType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#MeasurementType) | | | | | |

### OverallToolLength

OAL: largest length dimension of the tool item including the master insert where applicable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | OverallToolLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [OverallToolLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#OverallToolLengthType) | | | | | |

### PointAngle

angle between the major cutting edge and the same cutting edge rotated by 180 degrees about the tool axis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PointAngle | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [PointAngleType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#PointAngleType) | | | | | |

### ProtrudingLength

dimension from the yz-plane to the furthest point of the tool item or adaptive item measured in the -X direction

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ProtrudingLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CommonMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurement) | | | | | |
| Is a type [ProtrudingLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ProtrudingLengthType) | | | | | |

### ShankDiameter

DMM: dimension of the diameter of a cylindrical portion of a tool item or an adaptive item that can participate in a connection

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ShankDiameter | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [ShankDiameterType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ShankDiameterType) | | | | | |

### ShankHeight

H: dimension of the height of a shank

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ShankHeight | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [ShankHeightType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ShankHeightType) | | | | | |

### ShankLength

LS: dimension of the length of a shank

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ShankLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [ShankLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ShankLengthType) | | | | | |

### StepDiameterLength

length of a portion of a cutting tool that is related to the corresponding cutting diameter. The length is measured from the point "PK" of the corresponging diameter to the next projected point where the diameter starts to change

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | StepDiameterLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [StepDiameterLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#StepDiameterLengthType) | | | | | |

### StepIncludedAngle

angle between a major edge on a step of a stepped tool and the same cutting edge rotated 180 degrees about ist tool axis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | StepIncludedAngle | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [StepIncludedAngleType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#StepIncludedAngleType) | | | | | |

### ToolCuttingEdgeAngle

angle between the tool cutting edge plane and the tool feed plane measured in a plane parallel the xy-plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolCuttingEdgeAngle | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [ToolCuttingEdgeAngleType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolCuttingEdgeAngleType) | | | | | |

### ToolLeadAngle

angle between the tool cutting edge plane and a plane perpendicular to the tool feed plane measured in a plane parallel the xy-plane

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolLeadAngle | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [ToolLeadAngleType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#ToolLeadAngleType) | | | | | |

### UsableLengthMax

The maximum length of a cutting tool that can be used in a particular cutting operation including the non-cutting portions of the tool.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UsableLengthMax | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [AssemblyMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#AssemblyMeasurement) | | | | | |
| Is a type [UsableLengthMaxType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#UsableLengthMaxType) | | | | | |

### Weight

WT: The weight measured in grams

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Weight | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CommonMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CommonMeasurement) | | | | | |
| Is a type [WeightType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#WeightType) | | | | | |

### WiperEdgeLength

measure of the length of a wiper edge of a cutting item

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | WiperEdgeLength | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute [CuttingItemMeasurement](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#CuttingItemMeasurement) | | | | | |
| Is a type [WiperEdgeLengthType](file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\assets.html#WiperEdgeLengthType) | | | | | |

1. International Organization for Standardization. ISO 13399: Cutting tool data representation and exchange. Geneva, Switzerland, 2000. [↑](#footnote-ref-1)