

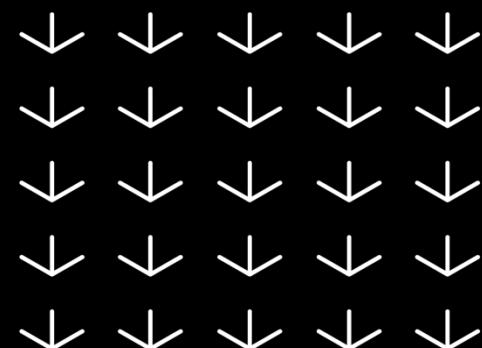


/// Kundentag 2024

CLASSIFICATION

AI

F. Wallner | 24.10.2024 | 14:00 Uhr



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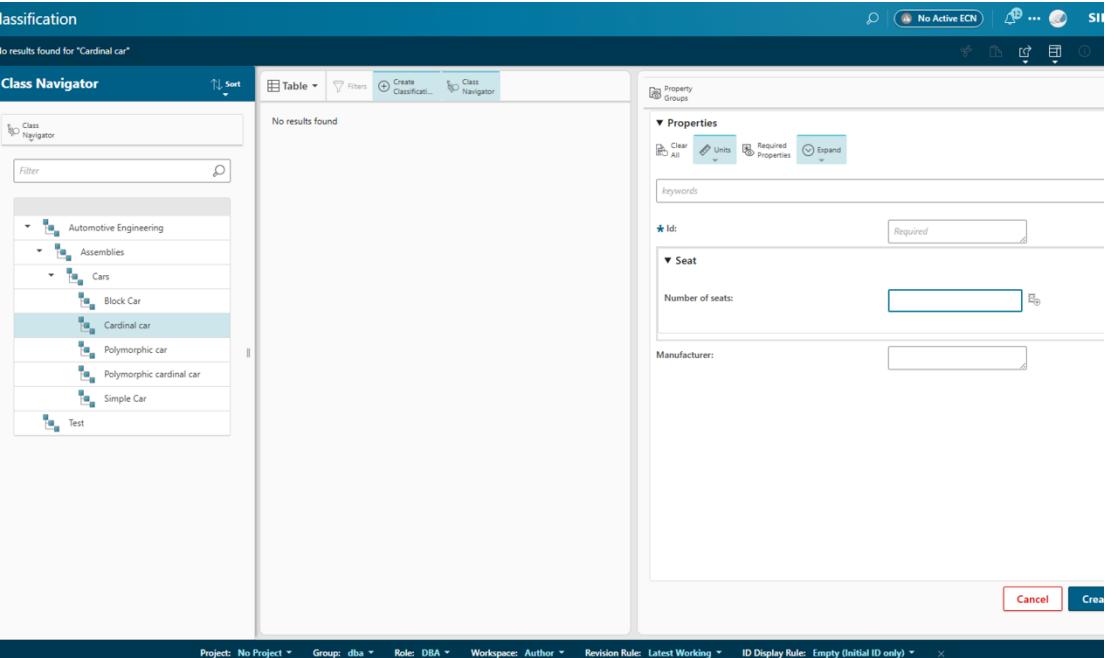
Tel +49 7031 410309-0
Fax +49 7031 410309-11
Mail kontakt@drwe.de
Web www.drwe.de



/// Was ist zu erwarten?

AGENDA

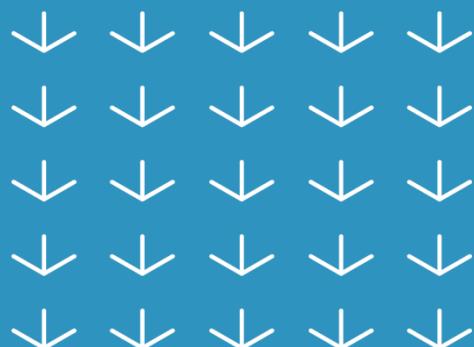
- Classification
 - Basic vs. Advanced
 - Features
 - Import
- AI
 - Funktion
 - Training
 - Demo
- Anwendung?



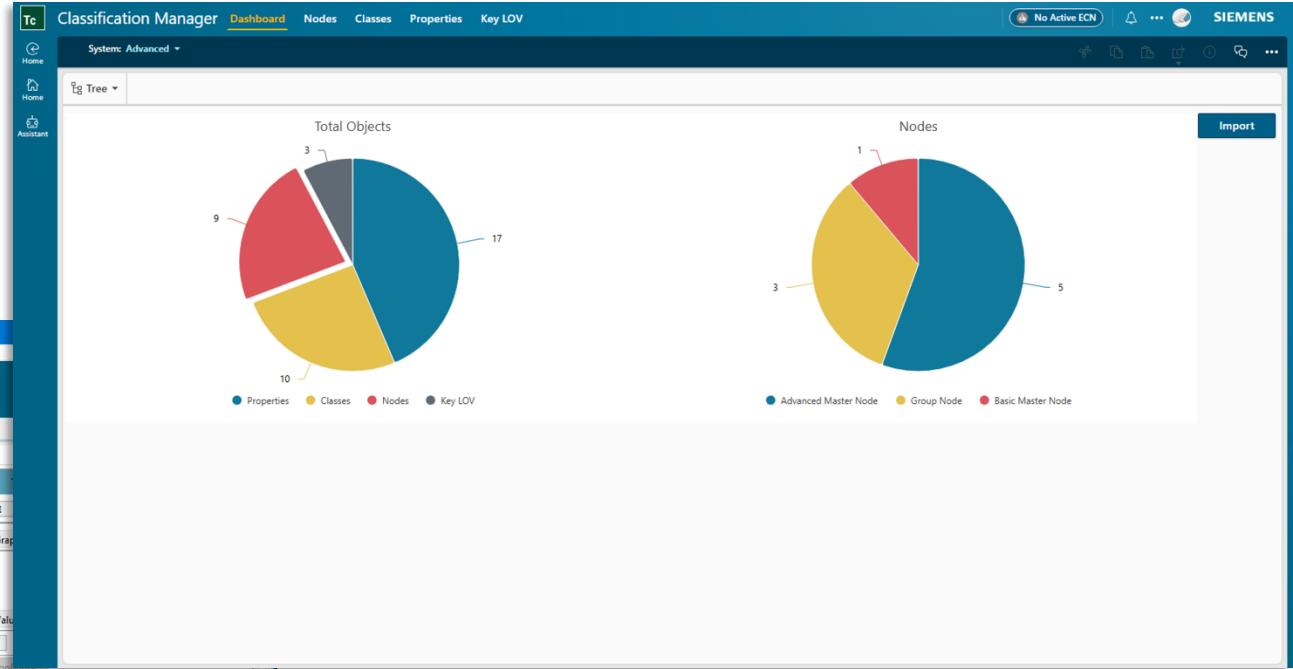
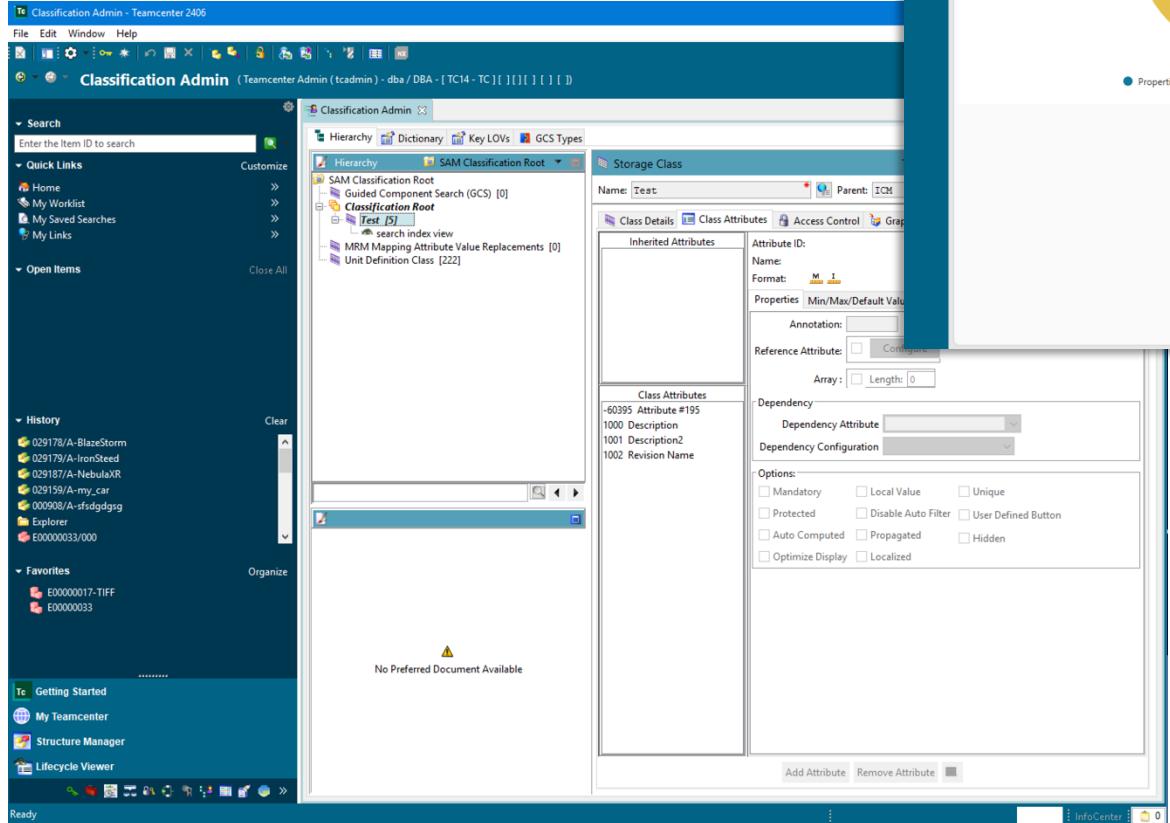
/// Classification

BASIC VS. ADVANCED

- Oder Old vs. New?
- Warum sollte ich wechseln?



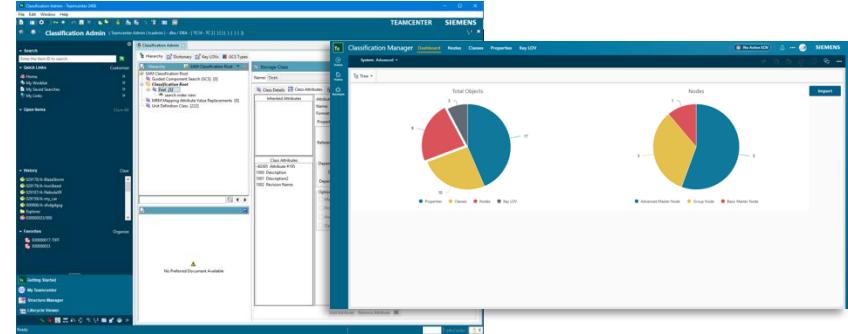
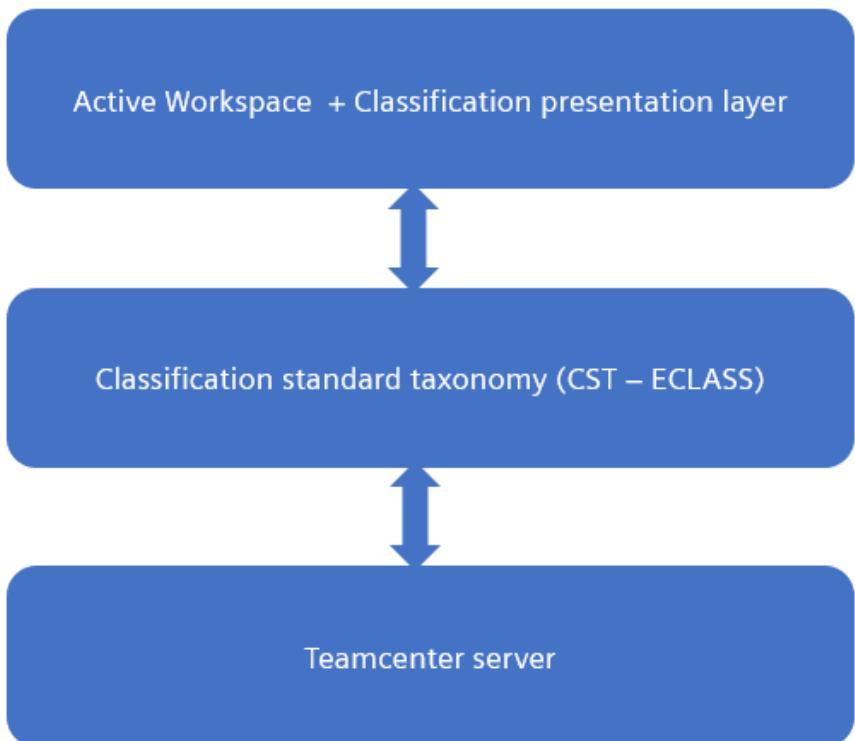
Old vs. New



- Warum überhaupt klassifizieren?
- Welche Voraussetzungen?

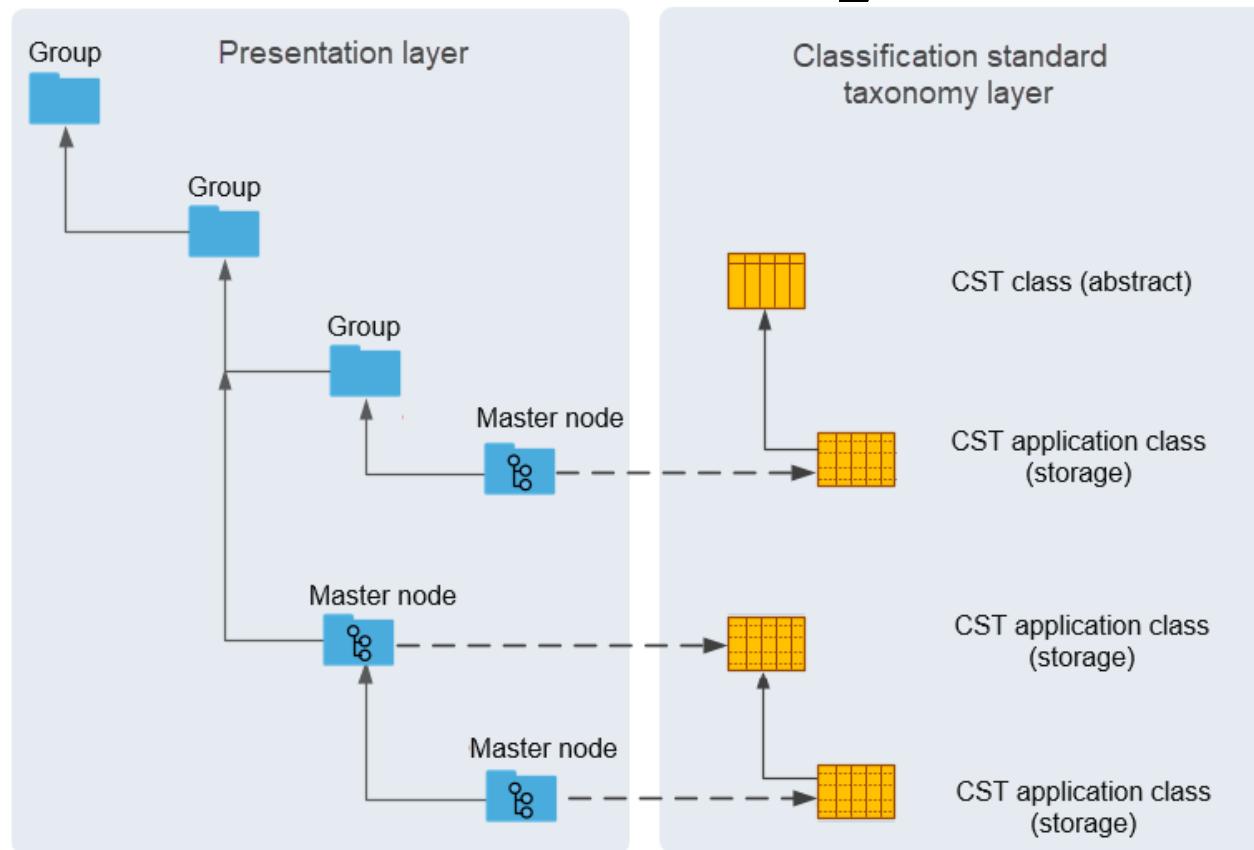
Basic vs. Advanced

- Schlüssel ist der Presentation Layer (CLS0) um von Alt nach Neu zu kommen

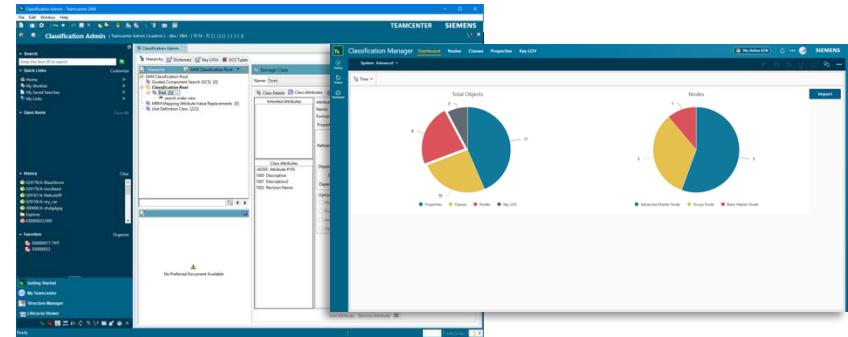


Quelle: https://docs.sw.siemens.com/en-US/do/c/282219420/PL20231129261301184.class_aw/xid1567127

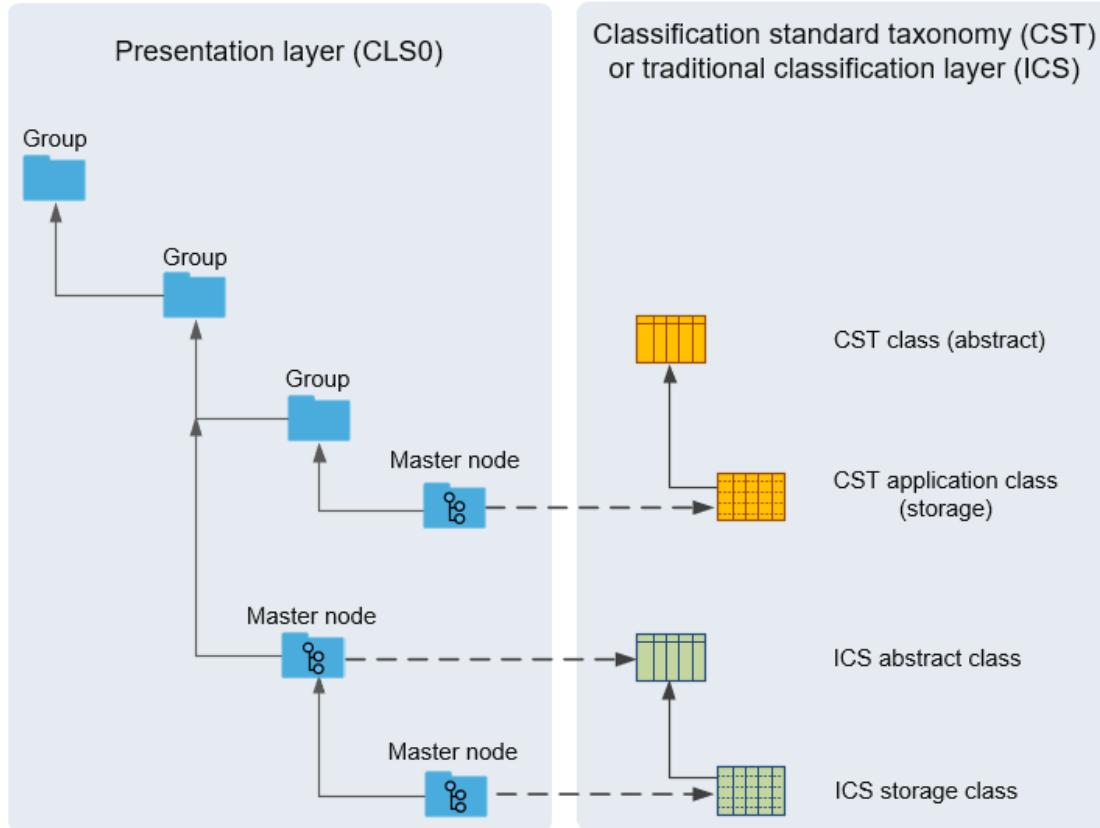
Basic vs. Advanced Der Presentation Layer



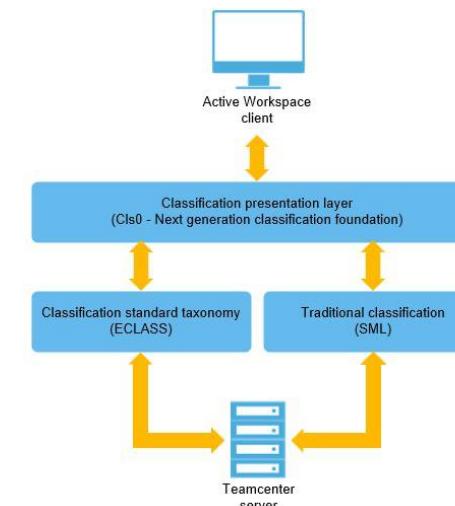
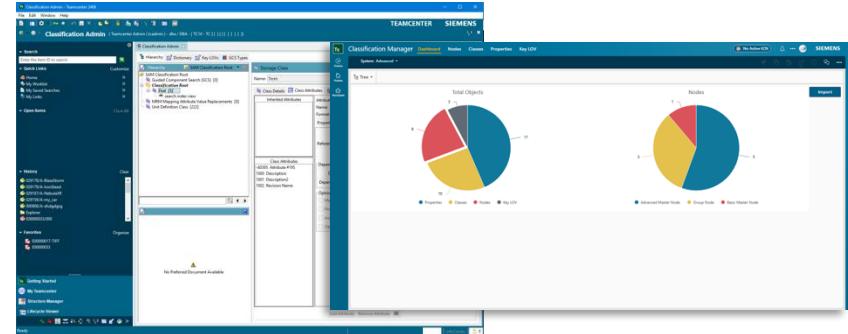
Quelle: https://do.cs.sw.siemens.com/en-US/do/c/282219420/PL20231129261301184.class_aw/xid1567127



Basic vs. Advanced Der Presentation Layer



Quelle: https://do.cs.sw.siemens.com/en-US/do/c/282219420/PL20231129261301184.class_a_w/x_id1567127



Basic nach Advanced Migration?

```
clsutility -migrate -classification2cst -cid=class-ID [-recursive | -confirm| -include_icos]
```

Migration summary for traditional objects				
TYPE	SML ID	CST ID	Status	Note
NodeDefinition	AD	SMPL1#AD#001	UNPROCESSED	
PropertyDefinition	-80001	SMPL1#02-f6f89w#001	UNPROCESSED	
PropertyDefinition	-80002	SMPL1#02-fsf89w#001	UNPROCESSED	
PropertyDefinition	-80005	SMPL1#02-e6f89w#001	UNPROCESSED	
PropertyDefinition	-80015	SMPL1#02-ccf89w#001	UNPROCESSED	
PropertyDefinition	-80018	SMPL1#02-bsf89w#001	UNPROCESSED	
KeyLOVDefinition	-80051	SMPL1#09-Tcf89w#001	UNPROCESSED	
PropertyDefinition	-80020	SMPL1#02-bmf89w#001	UNPROCESSED	
ClassDefinition	ADT-CONNECTION	SMPL1#01-ADT-CONNECTION#001	UNPROCESSED	
NodeDefinition	ADT-CONNECTION	SMPL1#ADT-CONNECTION#001	UNPROCESSED	
PropertyDefinition	-82005	SMPL1#02-q5989w#001	UNPROCESSED	
KeyLOVDefinition	-80040	SMPL1#09-WMf89w#001	UNPROCESSED	
PropertyDefinition	-86123	SMPL1#02-la989w#001	UNPROCESSED	
ClassDefinition	ADT-CONN-BUND	SMPL1#01-ADT-CONN-BUND#001	UNPROCESSED	
NodeDefinition	ADT-CONN-BUND	SMPL1#ADT-CONN-BUND#001	UNPROCESSED	

```
JSON input for KeyLOVDefinitions: C:\Users\ny6wyo\AppData\Local\Temp\KeyLOVDefinitions.json
JSON input for PropertyDefinitions: C:\Users\ny6wyo\AppData\Local\Temp\PropertyDefinitions.json
JSON input for ClassDefinitions: C:\Users\ny6wyo\AppData\Local\Temp\ClassDefinitions.json
JSON input for NodeDefinitions: C:\Users\ny6wyo\AppData\Local\Temp\NodeDefinitions.json

Operation completed successfully.
```

Quelle: https://docs.sw.siemens.com/en-US/doc/282219420/PL20231129261301184.class_awx/xId1567127

Warum?

- CST bietet mehr Features
- Wird in Zukunft erweitert (analog ECLASS)

Basic vs Advanced

Was ist CST?

- Basierend auf dem classification standard taxonomy framework
 - Standardisierter Aufbau von Klassen und Daten zum leichten Austausch von Kunden und Zulieferern
 - Unterstützt den ECLASS Standard
- Advanced Classification kann aber auch genutzt werden um eigene Hierarchien und Definitionen aufzubauen

ECLASS	CST	Traditional classification (ICS)
Value list	Key-LOV definition	Key-LOV
Property	Property definition	Dictionary attribute
Classification class	Node definition	--
Application class	Class definition	Group/class
IRDI	IRDI	ID
Property block	Property block	--
Application data	Classification object	ICO
Aspect	Aspect	--

Quelle: https://docs.sw.siemens.com/en-US/do/c/282219420/PL20231129261301184.class_awxid1567127

Basic vs Advanced Übersicht

	Basic classification	Advanced classification
Availability	Available on the rich client and Active Workspace.	Available Active Workspace.
Effectiveness	Effective in defining objects uniquely with properties for reuse.	Effective in capturing overall product information for PIM and MDM systems with support for ECLASS standard class hierarchy and definitions.
Standard Features	<ul style="list-style-type: none"> • Classification hierarchical representation • Flat list of properties • List of values • Unit of measure • Support for views • Limited to 200 Properties in a class 	<ul style="list-style-type: none"> • Class definition versioning • Flexible data modeling with attribute blocks, aspects, cardinality, and polymorphism. • Complex data type attributes • Native data storage • Support for namespaces • Unlimited number of properties • No Array limitations
Data model standards	Supports DIN-4000 standard and confirms to underlying specifications of ISO/TS-13399 standard.	Supports ECLASS standard and conforms to DIN 4002, ISO 13584-32, ISO 13584-42, IEC 61360 standards.
Hierarchy and class definitions	Define custom hierarchy and class definitions.	Define custom hierarchy and class definitions. Additionally supports standard based ECLASS hierarchy spanning more than 48 domains.
Data exchange support	Supports PLMXML, TCXML, and multisite.	Supports JSON, OntoML, BMEcat.

Quelle: https://docs.sw.siemens.com/en-US/doc/c/282219420/PL20231129261301184.class_aw/xid2022380

/// Classification

FEATURES

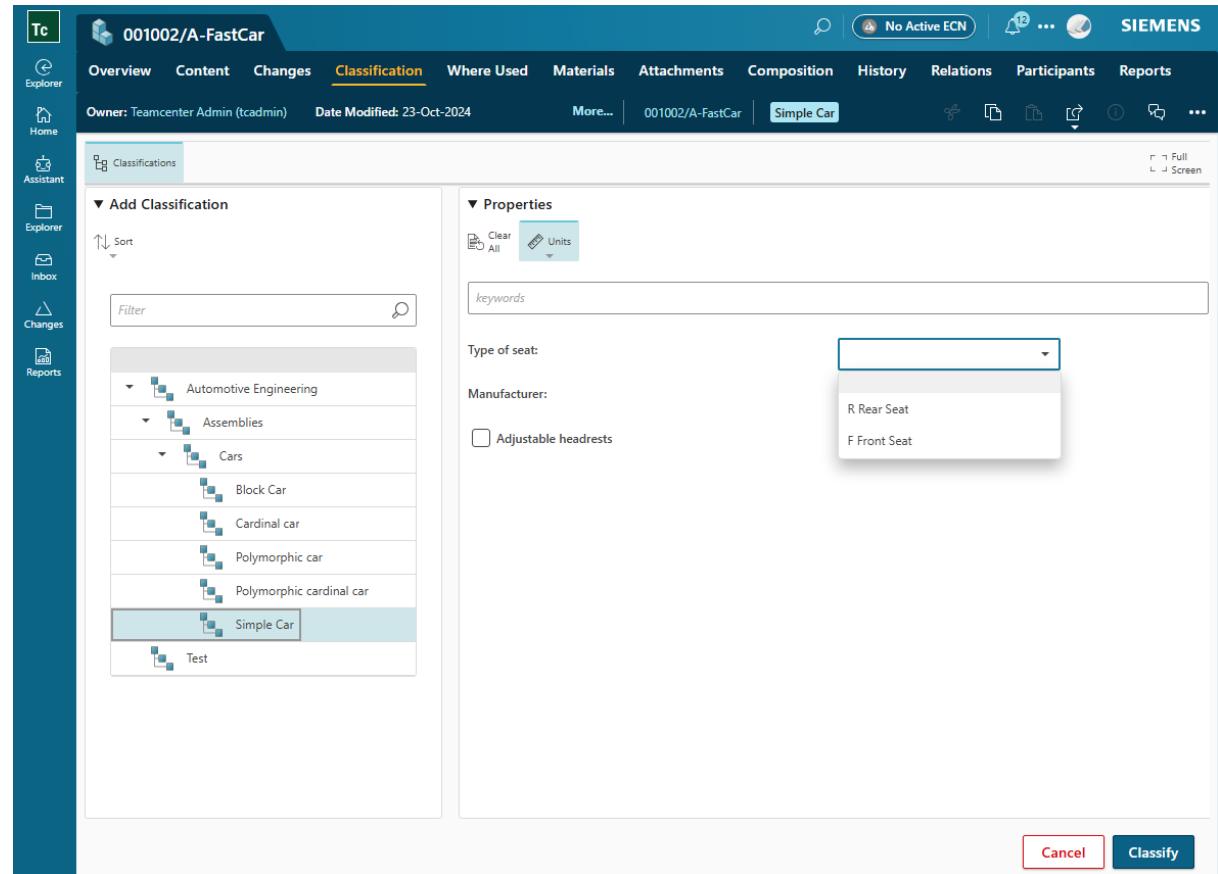
- Basics
- Neuerungen



Features

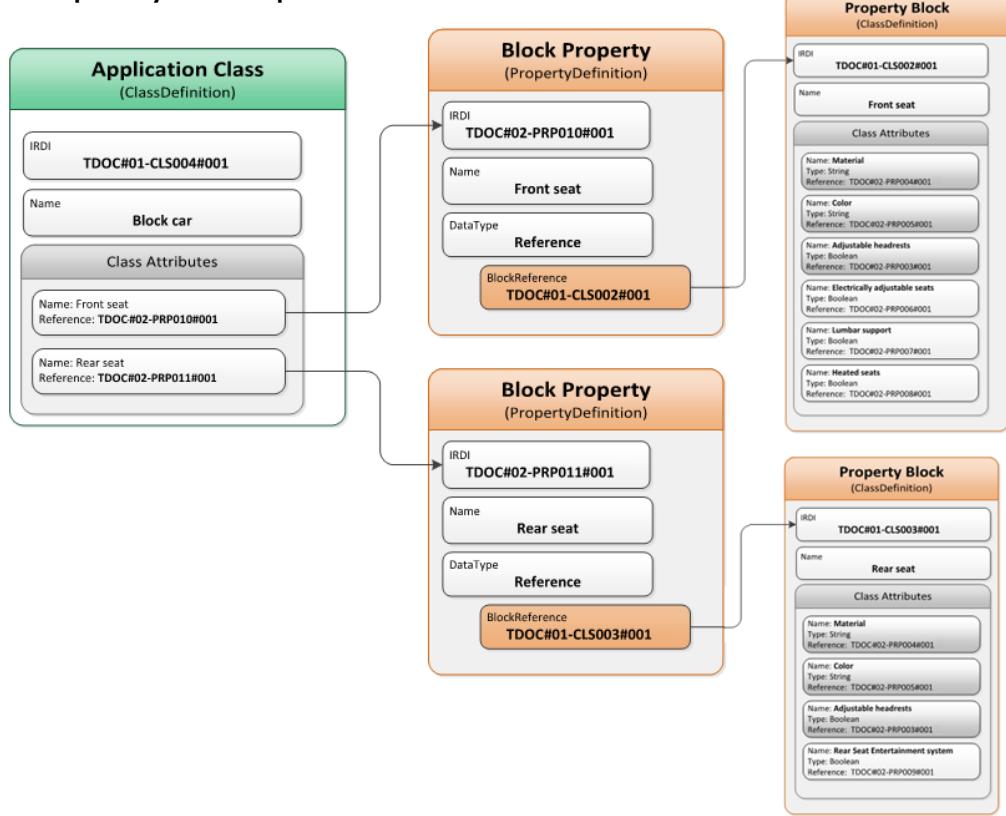
Die Basics...

- KeyLov
 - Listen können verschachtelt sein
 - Referenzieren immer auf ein Property
- Properties
 - Beschreiben Attribute einer Klasse
 - String, Integer, Double, Bool,...
- Classes
 - Anwendungsklasse wird von Knoten referenziert und kann zum Speichern von Daten verwendet werden. Sie enthalten die Eigenschaften, die zur Definition der Klasse verwendet werden
 - Eigenschaftsblockklasse fasst Gruppen von Eigenschaften zusammen. Sie können häufig verwendete Eigenschaften gruppieren, um zu vermeiden, dass jede Eigenschaft wiederholt einer Klasse zugewiesen werden muss
- Nodes
 - Ein Gruppenknoten dient der Organisation und kann keine Daten enthalten.
 - Ein Masterknoten verweist auf eine Anwendungsklasse, die Daten enthält. Stammknoten können andere Stammknoten als Kinder haben.



Features Die Neuerungen...

Property Groups



Screenshot of the Siemens Teamcenter interface showing the Classification tab for a document (001002/A-FastCar).

Classification Tab:

- Owner: Teamcenter Admin (tcaadmin)
- Date Modified: 23-Oct-2024
- More... | 001002/A-FastCar | Block Car

Classification Tree:

- Automotive Engineering
 - Assemblies
 - Cars
 - Block Car
 - Cardinal car
 - Polymorphic car
 - Polymorphic cardinal ca
 - Simple Car
 - Test

Property Groups:

- Front seat
- Back seat

Properties:

- Front seat
- Back seat

Material: (Input field)

Color: (Input field)

Checkboxes:

- Adjustable headrests
- Electrically adjustable seats
- Lumbar support
- Heated seats

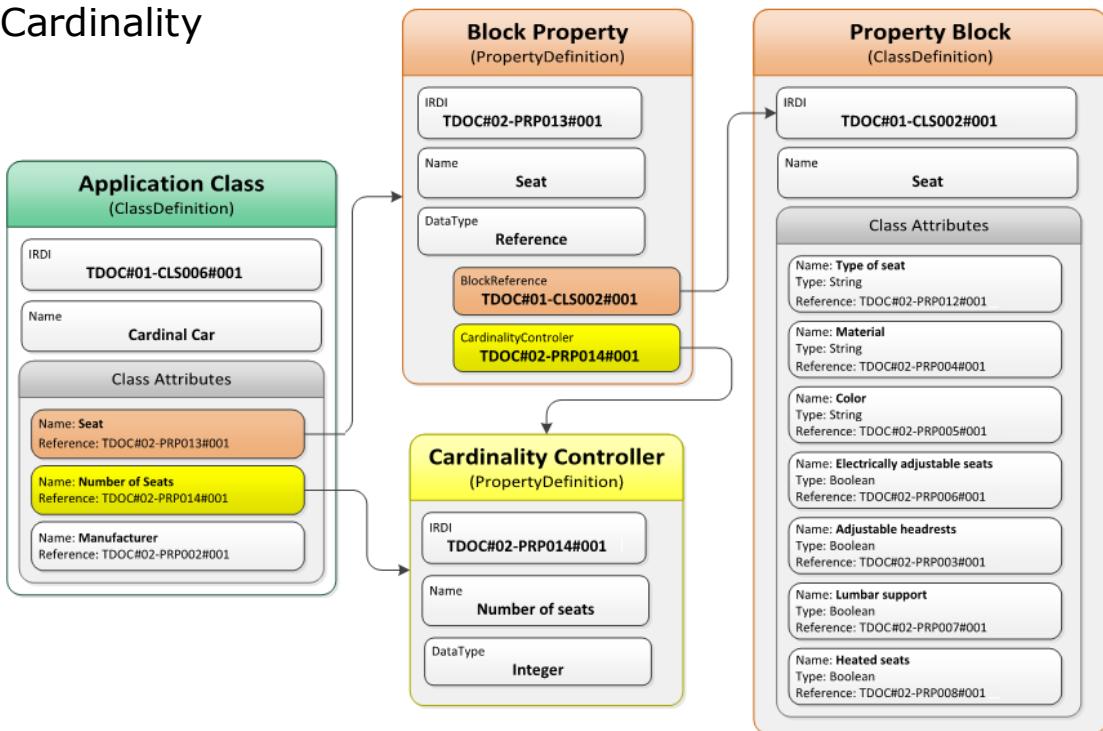
Buttons:

- Cancel
- Classify

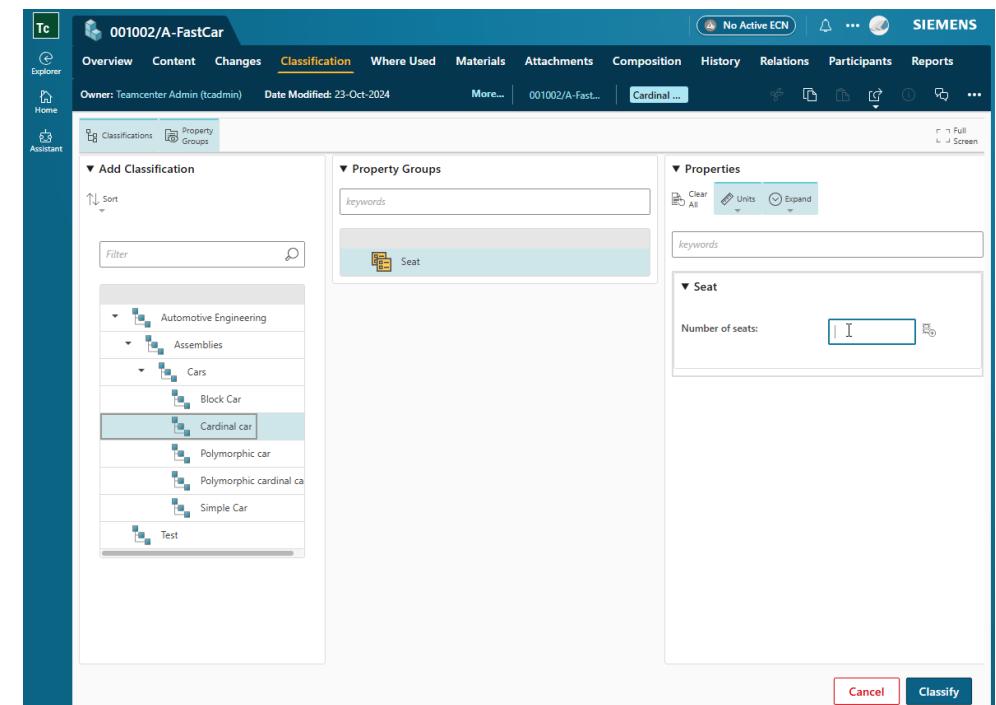
Quelle: https://docs.siemens.com/en-US/doc/282219420/PL20231129261301184.class_aw/xid1567127

Features Die Neuerungen...

Cardinality

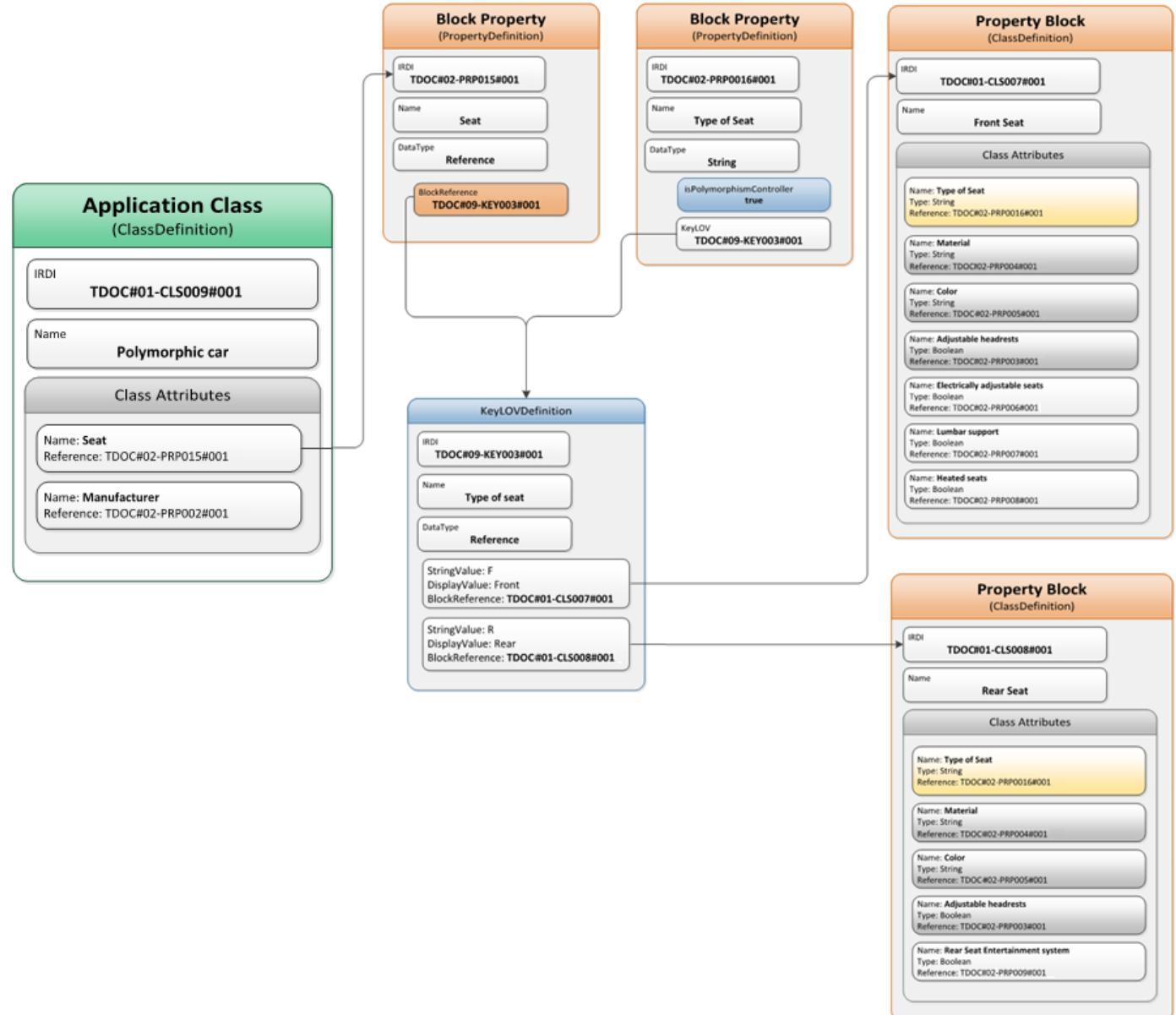
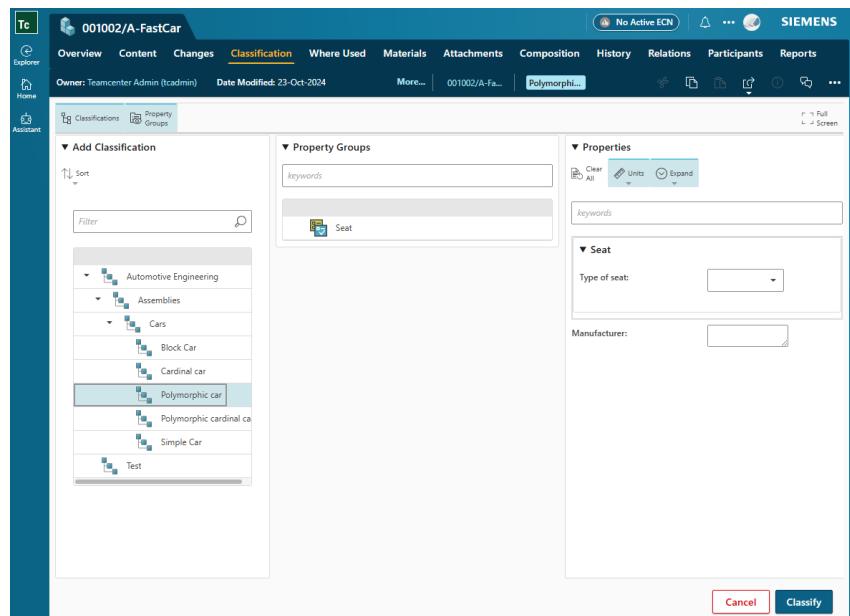


Quelle: https://docs.sw.siemens.com/en-US/doc/282219420/PL20231129261301184.class_a_w/x_id1567127



Features Die Neuerungen...

Polymorphism



Quelle: https://docs.sw.siemens.com/en-US/do/c/282219420/PL20231129261301184.class_aw/x/d1567127

/// Classification

IMPORT

- JSON
- Classification Manager

Import JSON-Files

Generelle Struktur von JSON-Files

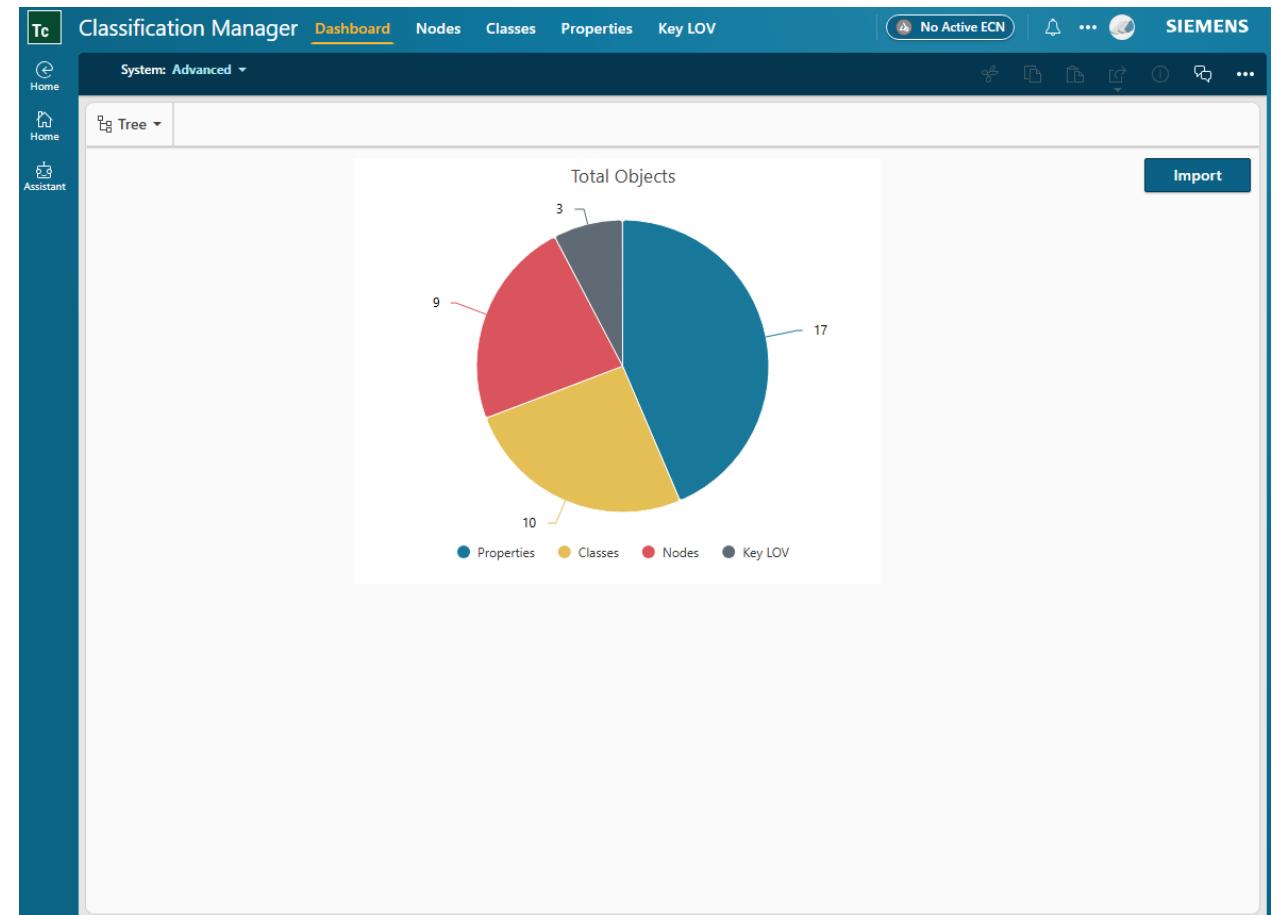
Zusatzinfo:

- Auch nützlich für das Anlegen von neuen Objekten
- `clsutility -create -classification_objects -request=itemCSTExample.json`

```
{  
  "SchemaVersion": "1.0.0",  
  "Locale": "en_US",  
  "KeyLOVDefinitions": [  
    {  
      "ObjectType": "09",  
      "Namespace": "DRWE",  
      "ID": "KEY001",  
      "Revision": "001",  
      "Name": "Type of seat",  
      "Status": "Develop",  
      "LOVItems": {  
        "DataType": "String",  
        "LOVStringItems": [  
          {  
            "StringValue": "R",  
            "DisplayValue": "Rear Seat"  
          },  
          {  
            "StringValue": "F",  
            "DisplayValue": "Front Seat"  
          }  
        ]  
      }  
    }  
  ]  
}
```

Import Classification Manager

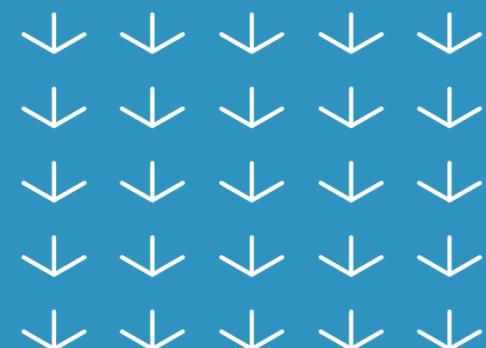
- Reihenfolge beachten
- Im- / Export in AWC möglich



/// Classification

AI

- Funktion
- Training



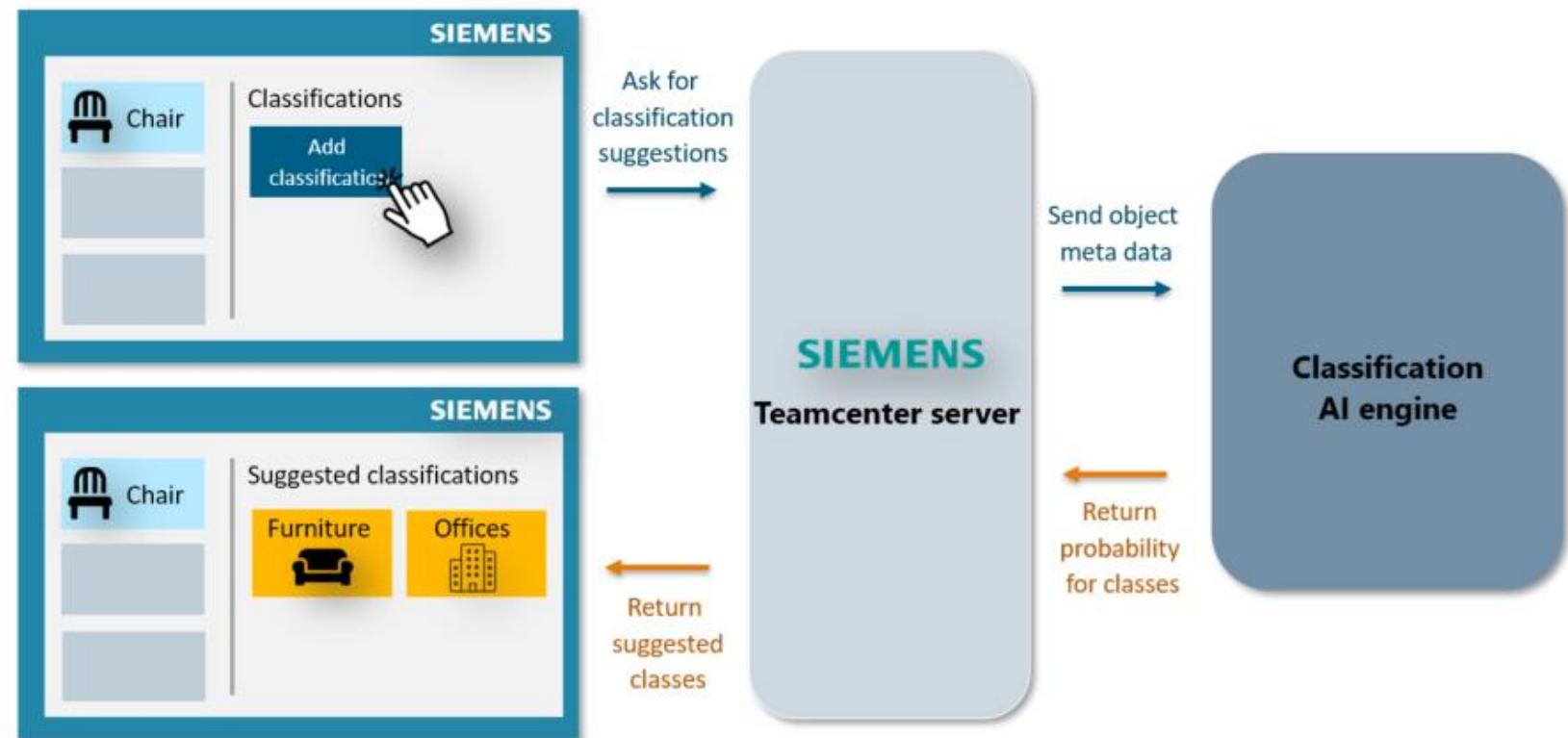
AI Funktion?

Vorschlag von Klassen auf Basis von definierten Metadaten

- Basiert auf Tensorflow ML
- Kann auch mit Geolus Shape Search verknüpft werden

Achtung:

Nur bei großen Hierarchien und viele Daten sinnvoll.



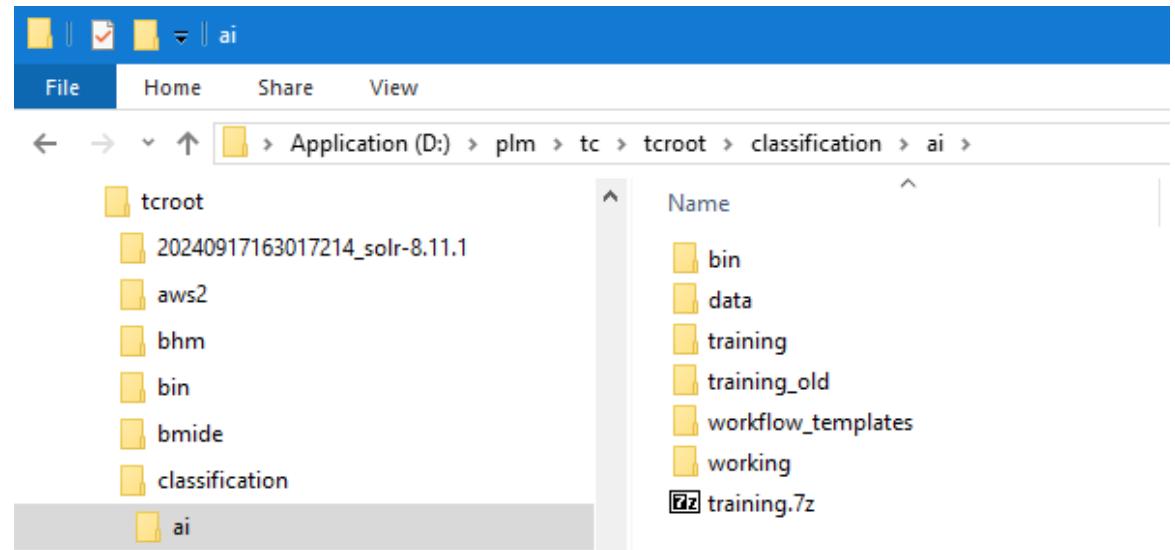
Quelle: https://docs.sw.siemens.com/en-US/doc/c/282219420/PL20231129261301184.class_aw/id1567127

AI Installation?

Installation laut Doku:

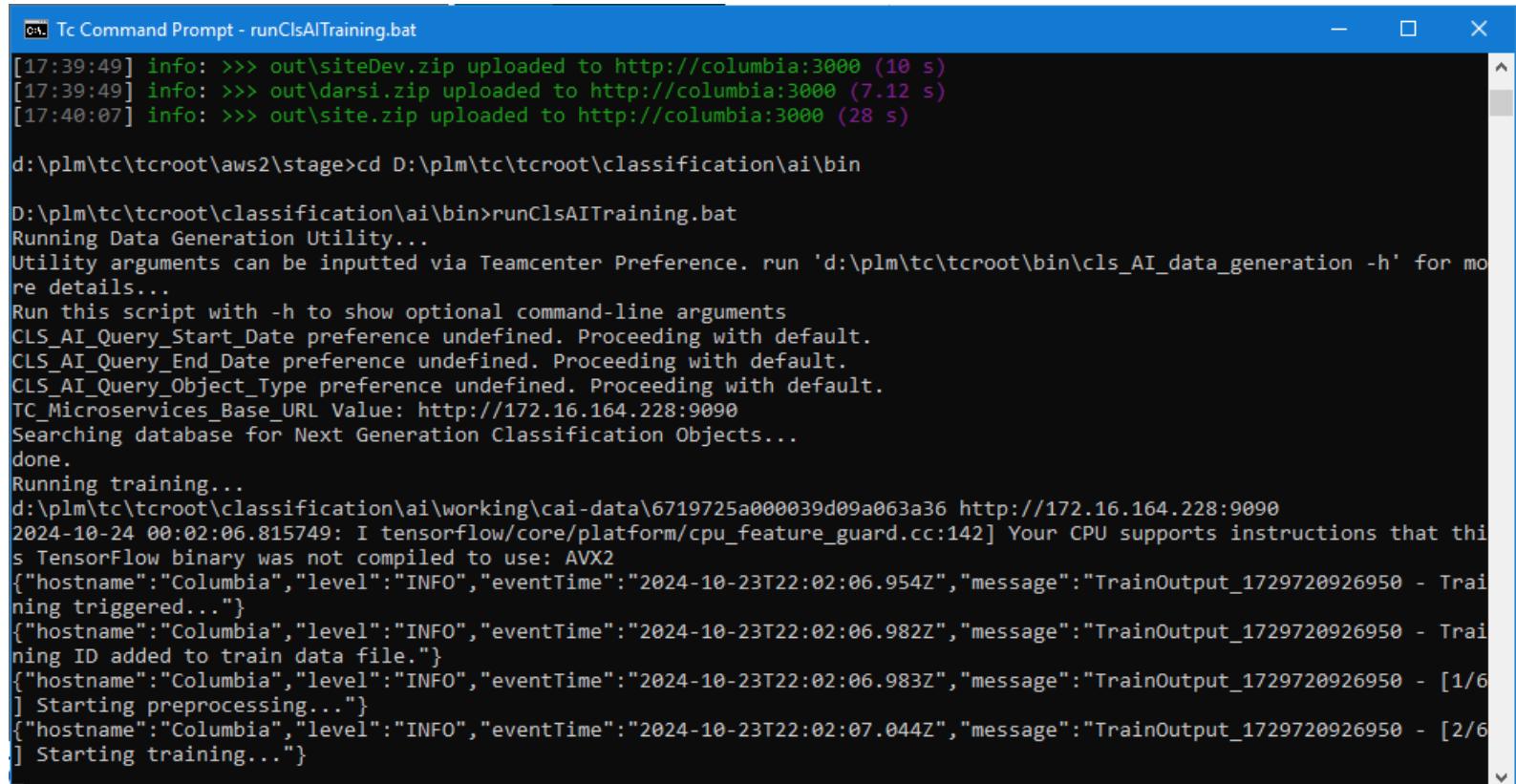
- Feature: Classification AI
- Feature: Classification AI Serving MS

Setzen von diversen Präferenzen nötig.



AI Training?

- Skript runClsAITraining ausführen
- CSV Files monitoren per:
 - cls_AI_data_generation
- CSV Files landen automatisch im Filerepo und sind verfügbar



```
[17:39:49] info: >>> out\siteDev.zip uploaded to http://columbia:3000 (10 s)
[17:39:49] info: >>> out\darsi.zip uploaded to http://columbia:3000 (7.12 s)
[17:40:07] info: >>> out\site.zip uploaded to http://columbia:3000 (28 s)

d:\plm\tc\tcroot\aws2\stage>cd D:\plm\tc\tcroot\classification\ai\bin

D:\plm\tc\tcroot\classification\ai\bin>runClsAITraining.bat
Running Data Generation Utility...
Utility arguments can be inputted via Teamcenter Preference. run 'd:\plm\tc\tcroot\bin\cls_AI_data_generation -h' for more details...
Run this script with -h to show optional command-line arguments
CLS_AI_Query_Start_Date preference undefined. Proceeding with default.
CLS_AI_Query_End_Date preference undefined. Proceeding with default.
CLS_AI_Query_Object_Type preference undefined. Proceeding with default.
TC_Microservices_Base_URL Value: http://172.16.164.228:9090
Searching database for Next Generation Classification Objects...
done.
Running training...
d:\plm\tc\tcroot\classification\ai\working\cai-data\6719725a000039d09a063a36 http://172.16.164.228:9090
2024-10-24 00:02:06.815749: I tensorflow/core/platform/cpu_feature_guard.cc:142] Your CPU supports instructions that this TensorFlow binary was not compiled to use: AVX2
{"hostname":"Columbia","level":"INFO","eventTime":"2024-10-23T22:02:06.954Z","message":"TrainOutput_1729720926950 - Training triggered..."}
{"hostname":"Columbia","level":"INFO","eventTime":"2024-10-23T22:02:06.982Z","message":"TrainOutput_1729720926950 - Training ID added to train data file."}
{"hostname":"Columbia","level":"INFO","eventTime":"2024-10-23T22:02:06.983Z","message":"TrainOutput_1729720926950 - [1/6] Starting preprocessing..."}
{"hostname":"Columbia","level":"INFO","eventTime":"2024-10-23T22:02:07.044Z","message":"TrainOutput_1729720926950 - [2/6] Starting training..."}]
```

AI Demo

The screenshot shows the Siemens Teamcenter software interface. The top navigation bar displays "Home (9 Objects)" under "rxc_mill_01_00002/A/1-FaceMill", with details: Owner: Cls. Nodeuser (clsnodeuser), Date Modified: 19-Oct-2021, Release Status: Type: Home Folder. The top right corner features the SIEMENS logo and a search icon.

The left sidebar contains a vertical navigation menu with the following items:

- Home
- Home
- Assistant
- Discussions
- Folders
- Active Folders
- Inbox
- Changes
- Schedules
- Schedule Tasks
- Reports
- Favorites
- Quick Access
- Settings
- Alerts
- Help
- No Active Change

The main workspace has tabs at the top: Navigate, Overview, Audit Logs, Overview, Finishes, Classification (which is selected), Made From, 3D, Where Used, Attachments, History, Parameters, Relations, Collaboration, Participants, Simulation, Reports, and Audit Logs. The "Classification" tab displays a section titled "CLASSIFICATIONS" with the message "This object has not been classified". A large blue "Add" button is centered below this message. To the right of the main workspace is a vertical toolbar with icons for Information, Discuss, Open, Cut, Copy, Paste, New, Edit, Manage, Share, and View.

The list of objects on the left includes:

- Square Insert (tc_insert_10_00_120_1013, Revision: A)
- Rhombic Insert (tc_insert_10_00_120_1020, Revision: A)
- Rhombic Insert (nxc_insert_02_00002, Revision: A)
- Newstuff (Owner: Cls. Nodeuser (clsnodeuser), Date Modified: 19-Oct-2021 19:00)
- Milling Cutter (tc_mill_20_50_120_1010, Revision: A)
- Mailbox (Owner: Cls. Nodeuser (clsnodeuser), Date Modified: 28-May-2021 14:02)
- Insert (tc_insert_10_00_110_1010, Revision: A)
- FaceMill (rxc_mill_01_00002, Revision: A) - This item is highlighted with a light blue background.
- Edge Insert (tc_insert_10_00_100_1011, Revision: A)

AI Demo

Home (9 Objects) nxc_mill_01_00002/A/1-FaceMill
Owner: Cls. Nodeuser (clsnodeuser) Date Modified: 19-Oct-2021 Release Status: Type: Home Folder

SIEMENS

Navigate Overview Audit Logs

List with Summary Excel Rows... Selection Mode Select All

Square Insert tc_insert_10_00_120_1013 Revision: A

Rhombic Insert tc_insert_10_00_120_1020 Revision: A

Rhombic Insert nxc_insert_02_00002 Revision: A

Newstuff Owner: Cls. Nodeuser (clsnodeuser) Date Modified: 19-Oct-2021 19:00

Milling Cutter tc_mill_20_50_120_1010 Revision: A

Mailbox Owner: Cls. Nodeuser (clsnodeuser) Date Modified: 26-May-2021 14:02

Insert tc_insert_10_00_110_1010 Revision: A

FaceMill nxc_mill_01_00002 Revision: A

Edge Insert tc_insert_10_00_100_1011 Revision: A

ADD CLASSIFICATION

Release: eCI@ss 9.0, eCI@ss 9.1, eCI@ss 10.0.1, eCI...

Filter

SUGGESTED CLASSIFICATIONS

(O) - Face Milling Cutter Manufacturing Resource Library > Tools > Co... Node representing Class [TC_MILL_20_20_100] 84% match

(O) - Disc Milling Cutter, three sid... Manufacturing Resource Library > Tools > Co... Node representing Class [TC_MILL_20_50_100] 12% match

GB_SOA_TEST

ICS_Library_Test_Group

Manufacturing Resource Library

Material Families

Miscellaneous

eCI@ass ADVANCED 4711-A1

Node 01

Node 01 Release

Automotive Engineering

CST Test Group

CST Test Group Release

Node With Unit in ID format

Root Node for Complex Data Hierarchy

SimpleNode01-name_value

GB_SOA_TEST

ICS_Library_Test_Group

Manufacturing Resource Library

Material Families

Miscellaneous

eCI@ass ADVANCED 4711-A1

Node 01

Node 01 Release

Automotive Engineering

The screenshot shows the SIMATIC 3D software interface with a sidebar containing various navigation and management icons. The main area displays a list of objects under 'Home' (9 Objects), including 'Square Insert', 'Rhombic Insert', 'Newstuff', 'Milling Cutter', 'Mailbox', 'Insert', 'FaceMill', and 'Edge Insert'. The 'FaceMill' object is currently selected. On the right, there's a detailed view of the 'FaceMill' object with tabs like 'Overview', 'Finishes', 'Classification', etc. Under the 'Classification' tab, there's a section for 'ADD CLASSIFICATION' where users can enter a release number and filter suggestions. A prominent feature is the 'SUGGESTED CLASSIFICATIONS' section, which lists several manufacturing classes with their names, descriptions, and match percentages. Below this, there are smaller sections for 'GB_SOA_TEST', 'ICS_Library_Test_Group', 'Manufacturing Resource Library', 'Material Families', 'Miscellaneous', and specific nodes like 'Node 01' and 'Node 01 Release'. Each suggestion includes a small icon and a hierarchical tree diagram.

AI Demo

Home (9 Objects) > nxc_mill_01_00002/A/1-FaceMill

Owner: Cls.Nodeuser (clsnodeuser) Date Modified: 19-Oct-2021 Release Status: Type: Home Folder

NAVIGATE Overview Audit Logs

ADD CLASSIFICATION

Release: eC1@ss 9.0, eC1@ss 9.1, eC1@ss 10.0.1, eC1@ss 10.1, eC1@ss 10.2

Filter

- Assemblies
- Components
 - Adapter and Extender
 - Boring
 - Drilling
 - Inserts
 - Milling
 - Cartridge
 - Milling Cutter with Indexable Insert
 - Angle Milling Cutter
 - Ball Mill / Radius Cutter
 - Bell Cutter
 - Disc Milling Cutter
 - End Mill
 - Face Mill
 - (O) - Face Milling Cutter
 - (O) - Plain Cutter, multiple rows
 - (O) - Shell End Mill, multiple rows
 - (O) - Square Shoulder Cutter

IMAGES

PROPERTIES

keywords

MASTER DATA

Tool Description	[DES]:
Comments	[REM]:
Tool Style Code	[TSCV]:
ISO Tolerance Class Shank Diameter	[TCDMM]:
Mill Tool Type ISO	[MILTTY]: A Face Mills, cutting side...
Milling Cutter Style	[MCSY]: A DIN 8030 - cutters wi...
Standard Number of Properties Layout	[NSM]:
Standard Number	[STDNO]:
Company Code	[COMPC]: IS
Identifying Order Number	[IDNR]: 3105675
Status:	

SITE SPECIFIC DATA

Minimal Amount:	
Weight of Item	[WT]: kg
Product Designation	[PRODDES]: SOF45 8/16-D100-08-31.75R
Vendor Reference Package	[VENPID]:

AI Demo

Home (9 Objects) > nxc_mill_01_00002/A/1-FaceMill

Owner: Cls.Nodeuser (clsnodeuser) Date Modified: 19-Oct-2021 Release Status: Type: Home Folder

Navigate Overview Audit Logs

Classification

CLASSIFICATIONS

(O) - Face Milling Cutter

IMAGES

Properties

MASTER DATA

Tool Description [DES]: Facemill
Mill Tool Type ISO [MILTTY]: A Face Mills, cutting sideways
Milling Cutter Style [MCSY]: A DIN 8030 - cutters with countersink screw
Company Code [COMPC]: IS
Identifying Order Number [IDNR]: 3105675

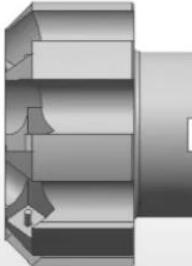
SITE SPECIFIC DATA

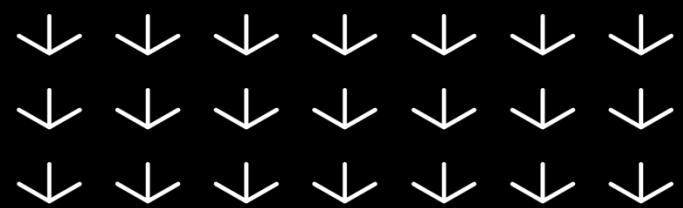
Product Designation [PRODDES]: SOF45 8/16-D100-08-31.75R
Master Insert Identification, Position A [MIIDA]: SN1306ANXN

GEOMETRY DATA

Shank Diameter/Connection Bore Diameter	[DMM]: 35	mm
Cutting Diameter	[DC]: 96	mm
Cutting Diameter Maximum	[DCX]: 109.63	mm
Body Diameter	[BD]: 110.4	mm
Hub Diameter	[DHUB]: 70	mm
Counterbore Diameter Connection Bore	[DCCB]: 60	mm
Cutting Depth Maximum	[CDX]: 6	mm
Countersunk Depth of Connection Bore	[LCCB]: 21.2	mm
Overall Height	[OAH]: 52.2	mm
Tool Cutting Edge Angle	[KAPR]: 45	°

"nxc_mill_01_00002/A/1-FaceMill" was classified to "(O) - Face Milling Cutter".





VIELEN DANK!





DR. WALLNER ENGINEERING

