

Status of Document Uploading and Data Transfer to XFEL Cavity Data Base

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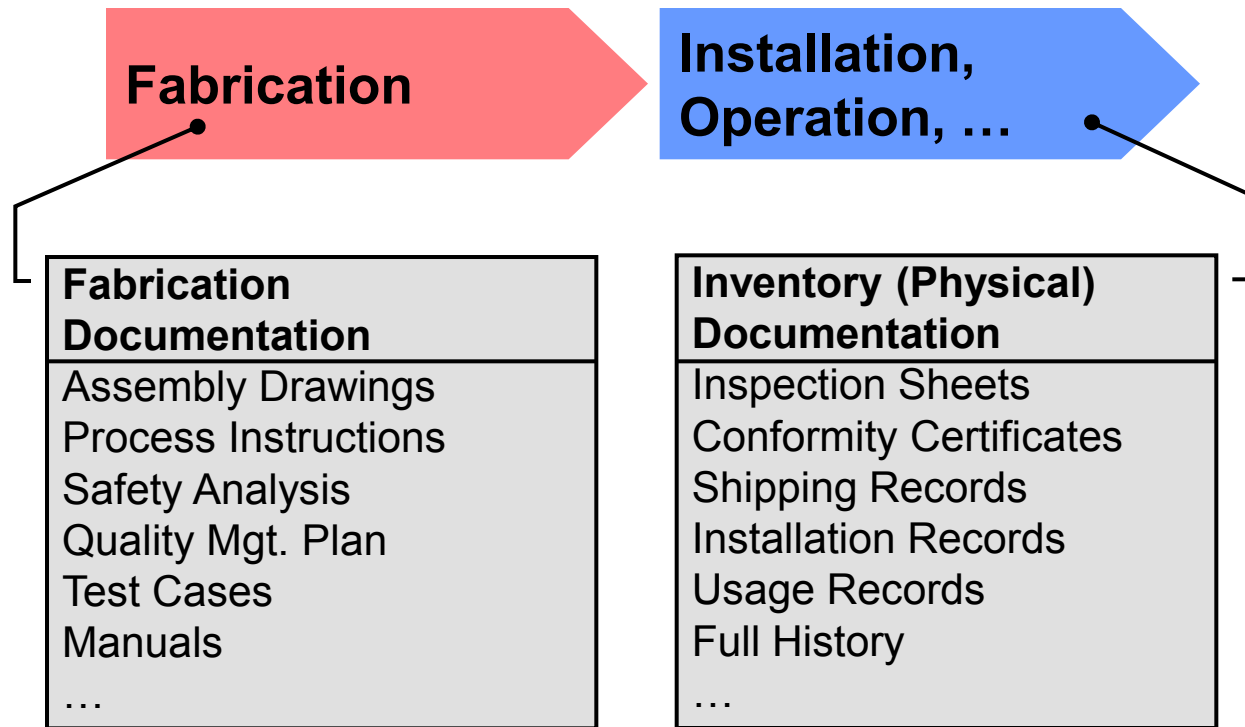
17.04.2012

Agenda

- > **MBOM Concept and Example**
- > Data Handling in Cavity Production



- > The documentation of any **deliverable**, aka **part** comprises:

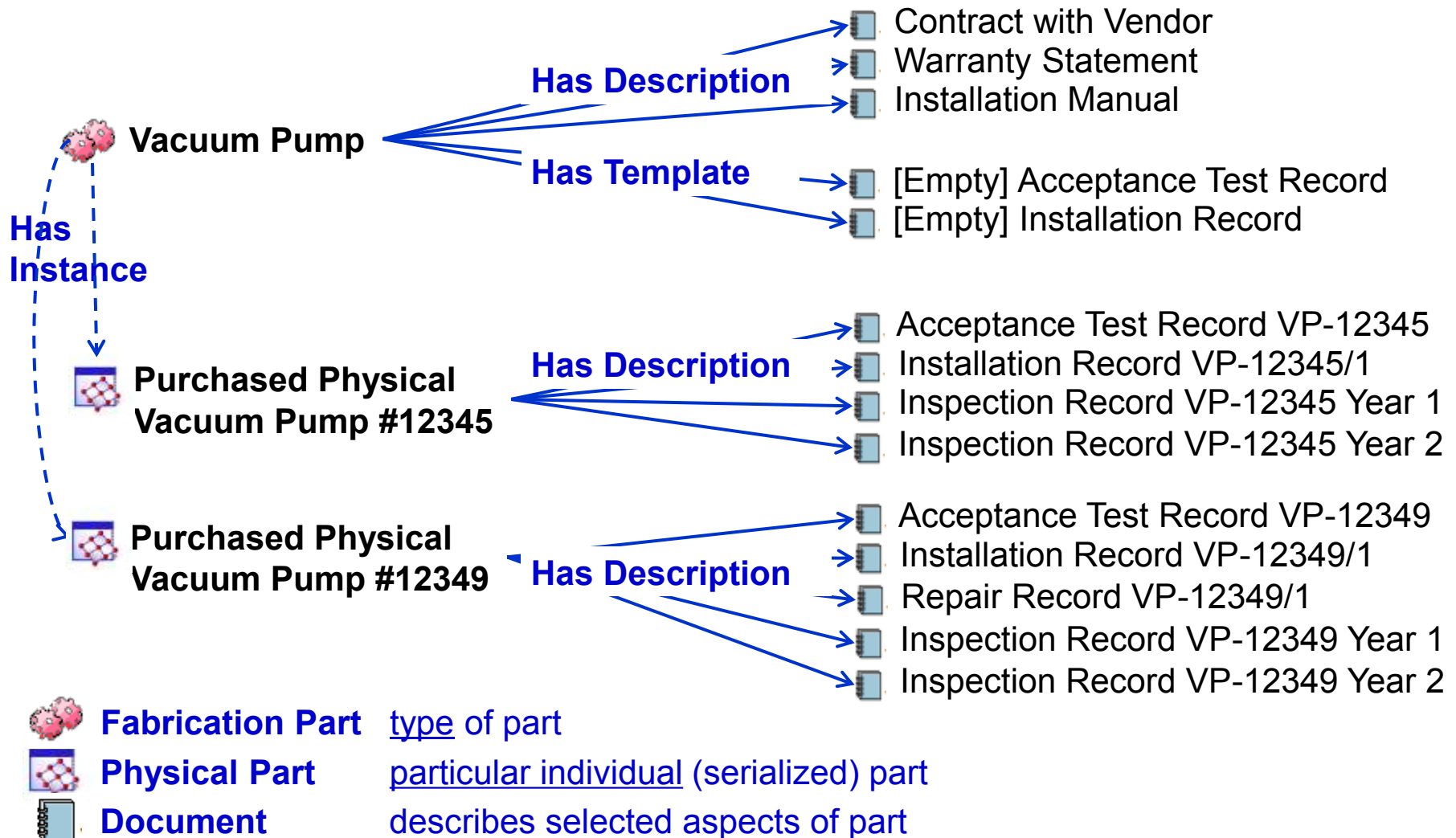


Fabrication Documentation for that **type of part**: Define how the part shall be realized (aka manufacturing dossier).

Inventory Documentation for that particular **individual physical part**: Keep track and record the history of each physical part.


















Example: Parts & Documents



- > More complex components are hierarchically decomposed into smaller, better manageable parts, yielding the so-called **product breakdown structure PBS**.
- > **PBS** level of detail depends on purpose: PBS for fabrication is called “**Manufacturing Bill of Materials, MBOM**” and shall contain all parts that occur in assembly, inspection, maintenance processes.



Cavity MBOM

EDMS-ID	Name ▼	Description	Quantity	Status
  D00000000551357,A,1,1	Cavity (CAV)			Working
 D00000000551707,A,1,1	bellow unit for cavity (BU)		1	Working
  D00000000551267,A,1,1	Dumb-bell (DB)		8	Working
  D00000000539167,A,1,1	Half cell		2	Released
 D00000000539087,A,1,1	Nb sheet		1	Released
 D00000000551977,A,1,1	Siffening Ring (SR)		1	Working
  D00000000551437,A,1,1	Long End Group (EGL)		1	Working
 D00000000552247,A,1,1	Long End Half Cell Unit (HCUL)		1	Working
 D00000000552157,A,1,1	Long End Tube Unit (ETUL)		1	Working
 D00000000592167,A,1,1	Reduction Ring (RR)		1	Working
 D00000000551527,A,1,1	Short End Group (EGS)		1	Working

The MBOM lists all parts which have to be tracked because ... (for many reasons)




Fabrication Part: Half Cell

Related Items


Attaches

There are no attached files






Is In Team Folder : 1 object

Name
 QM MBOM-fabrication structure...


Uses Fabrication Part : 1 object

Name
 Nb-sheet 265x265x2.8,A,1,1

Has Instances : 5 objects

Name
 P00215,A,1,1
 P00220,A,1,1
 P00229,A,1,1
 P00245,A,1,1
 P00262,A,1,1

Has Design : 1 object

Name
 01L 02.01.2--Normal Half Cell Pre-Turned Part,A,1,1

Properties

Name:

normal half cell

Description:

Access Scheme in Use:

Project: XFEL_WP04_MBOM

Designated Access Scheme (Project):

XFEL_WP04_MBOM

Creator:

Dammann_Jasper

Work Status:

Released

Serialized?:

True

Lot?:

True

More Properties ...



Physical Part: Half Cell P00168

Check Out From Team Submit Item Reports Bookmark History More Actions...



Physical Part , D00000000109129,A,1,1 , Item Info : Summary

Summary

BOM

Properties

Related Items

Assignment

All Versions

Related Items

Has Description : 2 objects

Name



[P00168-dimension record,A,1,1](#)



[P00168-frequency record,A,1,1](#)

Is Instance of : 1 object

Name



[normal half cell,A,1,1](#)

Properties

Description: normal half cell
Serial Number: P00168
Life Cycle State: Completed
Access Scheme Team:
in Use: XFEL_WP04_EZ_Team
Designated
Access Scheme XFEL_WP04_Parts
(Project):
Creator: system_test_EZ
Work Status: Working

[More Properties ...](#)

Preview Image(s)

Type (Instance of)
normal half cell
Serial Number
P00168
EDMS-ID
D00000000109129



Inspection Sheets for P00168: M01 and F01

Related Items

Attaches

[Export Table As](#) ☒ CSV ☐ HTML ☐ XML

File Name

- [V_F01-EZ_P00168.pdf](#)
- [V_F01-EZ_P00168.jpg](#)
- [V_F01-EZ_P00168.xlsx](#)
- [V_F01-EZ_P00168_stamp.pdf](#)

Is Description For : 1 object

Name

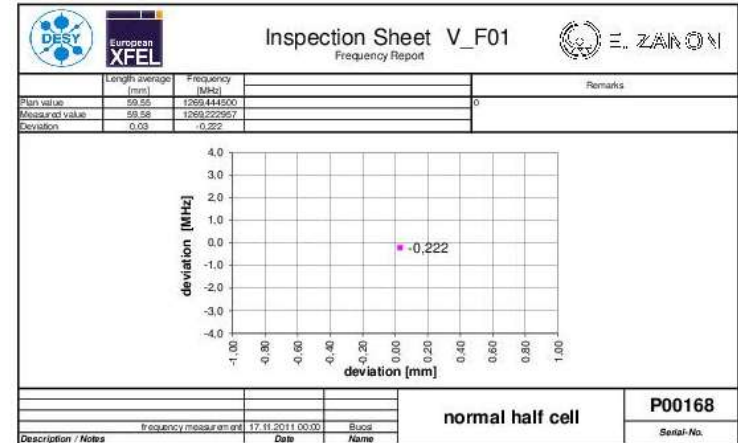
[P00168.A.1.1](#)

Properties

Name: P00168-frequency record
 Description: Inspection sheet, frequency, normal half cell, Pruefprotokoll, Frequenz, Normalhalbzelle (test number V_F01)
 Access Scheme in Use: Project XFEL_WP04_EZ_Internal
 Designated Access Scheme XFEL_WP04_EZ_Internal (Project):
 Creator: system_test_EZ
 Work Status: Released

[More Properties...](#)

Preview Image(s)



Related Items

Attaches

[Export Table As](#) ☒ CSV ☐ HTML ☐ XML

File Name

- [V_M01-EZ_P001682.pdf](#)
- [V_M01-EZ_P001682.jpg](#)
- [V_M01-EZ_P001682.xlsx](#)
- [V_M01-EZ_P00168_stamp2.pdf](#)

Is Description For : 1 object

Name

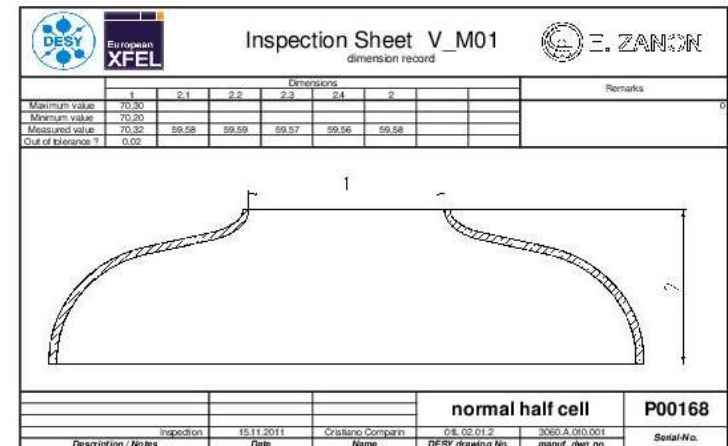
[P00168.A.1.1](#)

Properties

Name: P00168-dimension record
 Description: Inspection sheet, mechanical, normal half cell, Pruefprotokoll, mechanisch, Normalhalbzelle (test number V_M01)
 Access Scheme in Use: Project XFEL_WP04_EZ_Internal
 Designated Access Scheme XFEL_WP04_EZ_Internal (Project):
 Creator: system_test_EZ
 Work Status: Released

[More Properties...](#)

Preview Image(s)



Design Part: Half Cell

Related Items

Attaches

There are no attached files


Is In Team Folder : 1 object

Name
 CAD Working Data...

Has Description : 2 objects

Name
 01L 02.01.2--Normal Half Cell Pre-Turned Part.A.1.2
 01L 02.01.2--Normal Half Cell Pre-Turned Part.B.1.3

Is Design for Fabrication Part : 14 objects

Name
 normal half cell.A.1.1

Properties

Name: 01L 02.01.2--Normal Half Cell_Pre-Turned Part

Description:

Access Scheme in Use: Project XFEL_WP04

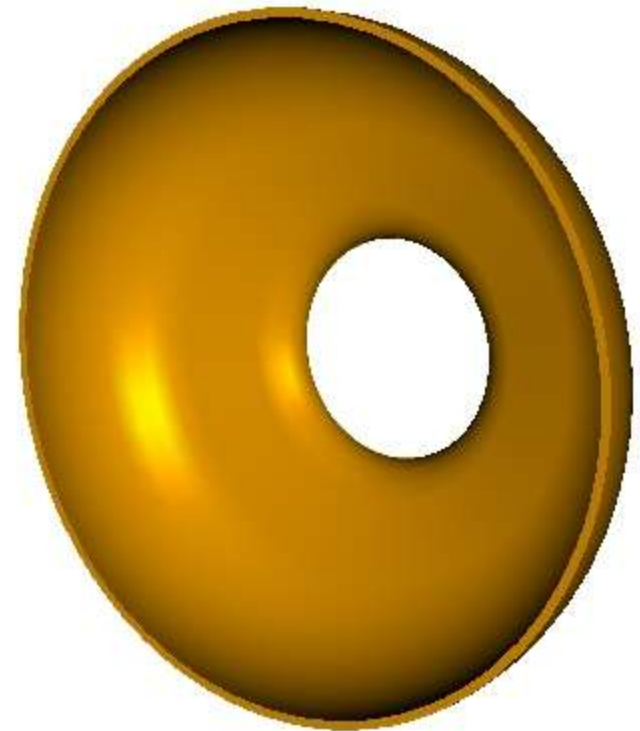
Designated Access Scheme (Project): XFEL_WP04

Creator: Klinke_Daniel

Work Status: Released

[More Properties ...](#)

Preview Image(s)



CAD-Drawing: Half Cell

Related Items

Is In Team Folder : 1 object

Name
02L Cavity in Helium Tank Drawings (DE_en)...

Is Description for : 1 object

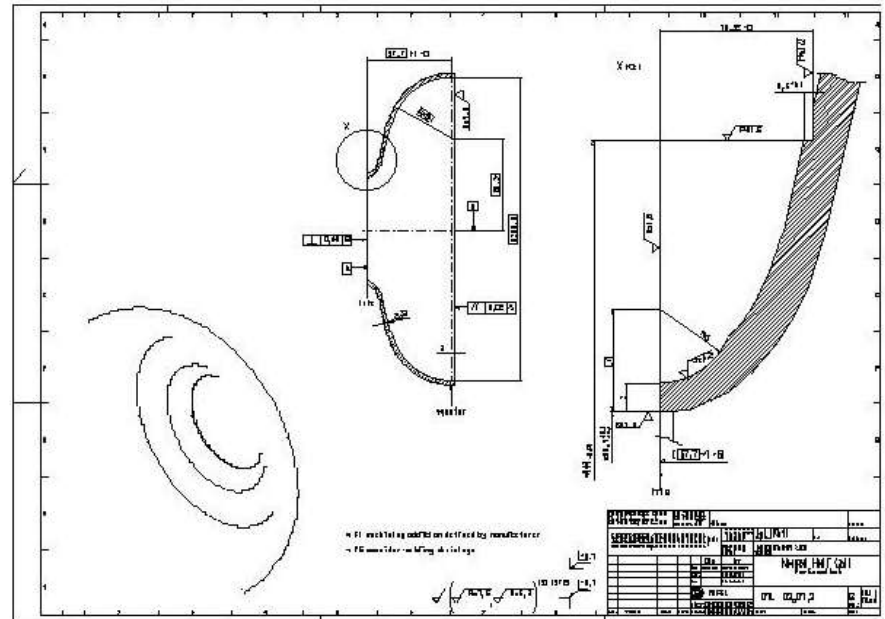
Name
01L 02.01.2--Normal Half Cell Pre-Turned Part A.1.1

Properties

Name: 01L 02.01.2--Normal Half Cell_Pre-Turned Part
Description: Normal Half Cell Pre-Turned Part
Access Scheme in Use: Team: XFEL_WP04_CAD_Team
Designated Access Scheme (Project): XFEL_WP04
Creator: Klinke_Daniel
Work Status: Working

[More Properties...](#)

Preview Image(s)



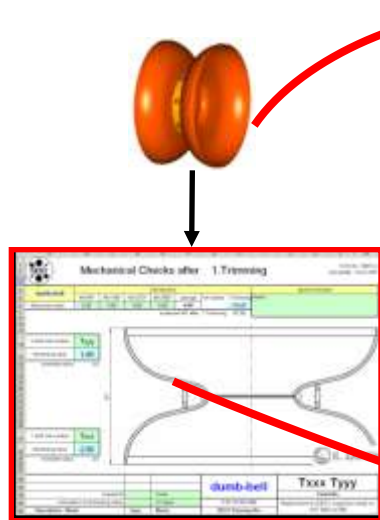
Agenda

- > MBOM Concept and Example
- > **Data Handling in Cavity Production**



Data model

Real World



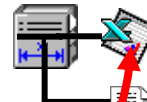
Inspection Sheet

EDMS



Physical Part

Quality-Management-Document

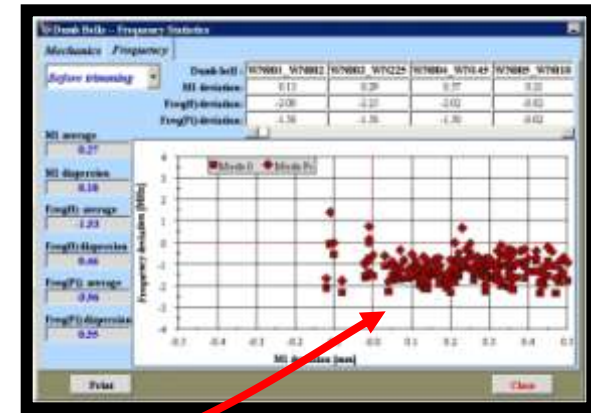


Files

Parts Tracking & Documentation

- Parts based
- Process based

Cavity-DB

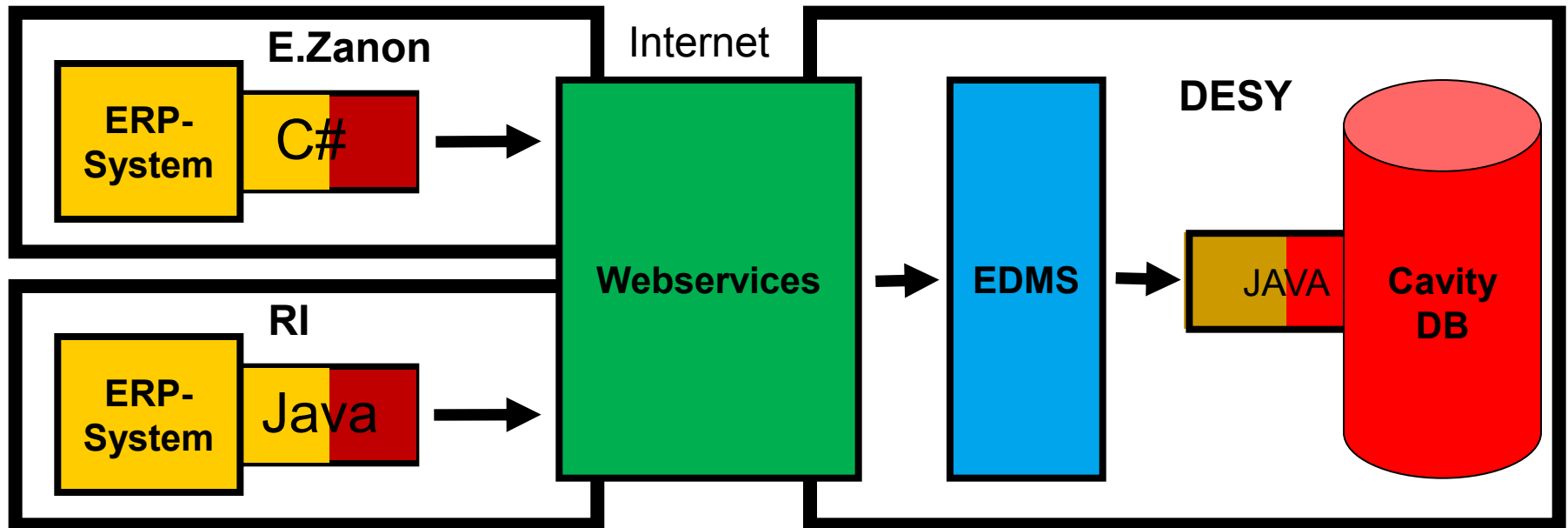


Statistical evaluation



Systems used for data transfer

Automated data transfer from system to system



Status: Interfaces are developed and tested

Next steps: Tests of data transfer for all types of inspection sheets



Types of inspection sheets until acceptance level 1

29 types of inspection sheets until acceptance level 1

Test number first letter	second letter	Spec Chapter	Type of test or documentation	Test object	Test point of time	Store in EDMS	Use DESY form	Add paper	Pre- scribed
V Up to finished semi-finished product									
V	F01		Frequency	HCN	acc. to TP	+	D*2088851	-	f
V	F02		Frequency	HCL	acc. to TP	+	D*2089041	-	f
V	F03		Frequency	HCS	acc. to TP	+	D*2089101	-	f
V	M01		mechanical, geometry	HCN	acc. to TP	+	D*2089251	-	m*
V	M02		mechanical, geometry	HCL	acc. to TP	+	D*2089341	-	m*
V	M03		mechanical, geometry	HCS	acc. to TP	+	D*2089401	-	m*
V	S01		3D measurement	HCN	acc. to TP	+	-	-	f
V	S02		3D measurement	HCL	acc. to TP	+	-	-	f
V	S03		3D measurement	HCS	acc. to TP	+	-	-	f

W Fabrication groups									
W	F01		Frequency	DB	after trimming	+	D*2192711	-	m
W	F02		Frequency	EGL	after trimming	+	D*2192851	-	m
W	F03		Frequency	EGS	after trimming	+	D*2192781	-	m
W	M01		mechanical, geometry	DB	after trimming	+	D*2193151	-	m
W	M02		mechanical, geometry	EGL	after trimming	+	D*2193291	-	m
W	M03		mechanical, geometry	EGS	after trimming	+	D*2193431	-	m
W	S01		3D measurement	DB	after trimming	+	-	-	m
W	S02		3D measurement	EGL	after trimming	+	-	-	m
W	S03		3D measurement	EGS	after trimming	+	-	-	m
W	L01		leak check between space I and III	EGL	after trimming	+	-	-	m*
W	L02		leak check between space I and III	EGS	after trimming	+	-	-	m*

X Finished cavity									
X	HCP		half cell position, expected (foreseeable) length after tuning	CAV	after equator welding	+	D*2548891	+	m
X	V01		Optical inspection of the equator welding seams	CAV	after equator welding	+	-	+	m
X	M01		Mechanical, geometry	CAV	after equator welding	+	D*2552011	+	m
X	F01		RF-Measurement - frequencies of the fundamental mode pass band	CAV	after equator welding	+	D*2549301	+	m
X	L01		Leak check space II	CAV	after equator welding	+	-	+	m
X	V02		Final visual examination, all welds, all surfaces	CAV	after equator welding	+	-	+	m

ACCEPTANCE LEVEL 1

Test number first letter	second letter	Spec Chapter	Type of test or documentation	Test object	Test point of time	Store in EDMS	Use DESY form	Add paper	Pre- scribed
V Up to finished semi-finished product									
V	F01		Frequency	HCN	acc. to TP	+	D*2088851	-	f
V	F02		Frequency	HCL	acc. to TP	+	D*2089041	-	f
V	F03		Frequency	HCS	acc. to TP	+	D*2089101	-	f
V	M01		mechanical, geometry	HCN	acc. to TP	+	D*2089251	-	m*
V	M02		mechanical, geometry	HCL	acc. to TP	+	D*2089341	-	m*
V	M03		mechanical, geometry	HCS	acc. to TP	+	D*2089401	-	m*
V	S01		3D measurement	HCN	acc. to TP	+	-	-	f
V	S02		3D measurement	HCL	acc. to TP	+	-	-	f
V	S03		3D measurement	HCS	acc. to TP	+	-	-	f



To Do for each Type of Inspection Sheet

1. Create template for each inspection sheet (DESY) and agree with supplier
2. Generate filled inspection sheets during production by supplier's ERP system
3. Test format and content of the generated inspection sheets
4. Upload inspection sheets into EDMS-Test-Environment
5. Import data from EDMS into XFEL-Cavity DB
6. Test finished successfully
→ Approval for upload to production systems
7. Upload into EDMS production system
8. Import data into XFEL-Cavity DB
→ Monitor the automated data transfer continuously



Status of data transfer

- For acceptance level 1: 29 types of inspection sheets per supplier
 - All inspection sheet templates exist and are reviewed
 - All types of inspection sheets can be generated by supplier's ERP systems
 - All types of inspection sheets of E. Zanon are checked by DESY (RI in progress)
 - For 7 types of inspection sheets: Upload tests to EDMS test environment successful
 - For 7 types of inspection sheets: Test data import into XFEL Cavity-DB successful
 - Ongoing work for remaining types of inspection sheets

- For acceptance level 2 and 3: ca. 50 types of inspection sheets per supplier
 - Draft templates exist for all inspection sheets (?)
 - Six templates of inspection sheets are reviewed, import to XFEL Cavity-DB is prepared
 - ...



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