



MTF for HL-LHC

Hector Garcia Gavela on behalf of the PDQR Office and WP4



HL-LHC Procurement, Baseline Documentation, Quality & Risk Office

Outline

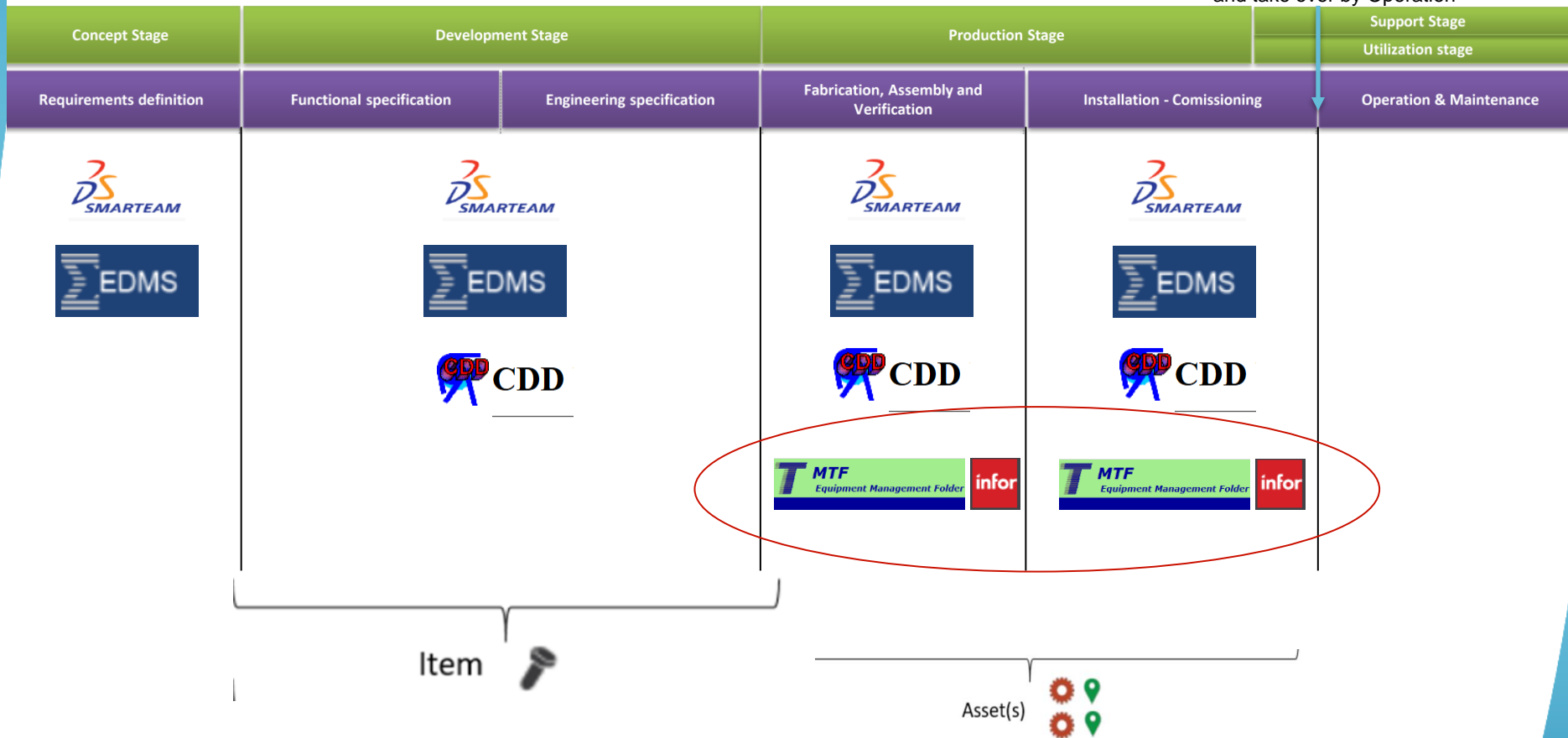
- Introduction
- Item vs Asset;
- MIP and MTF;
- MTF: Assets, Assemblies and Steps;
- Manufacturing Documents;

Why do we use MTF/EAM for HL-LHC?

- **Identification of the equipment** - Unique Serial Number for each component (asset) produced
- **Traceability of components** - what is the equipment made of
- **Production follow-up** – Electronic Manufacturing and Inspection Plan (Workflow for production and testing)
- **Storage of Manufacturing data** – Each asset will have its individual manufacturing folder with the QC reporting
- **Management of Nonconformities**
- **Installation in the machine** - What goes where

When – The full HL-LHC life-cycle

End of the HL-LHC Project
and take over by Operation





Identification

MTF / EAM is used to provide an **unique identifier** to **each component** manufactured for the Project (according to the **granularity agreed** with the **Technical teams**), based on the **PBS (Project Breakdown Structure)** and the **BOM (Bill of Materials)** of the **equipment**

H C A C F _ A 0 0 4 - U K 0 0 0 0 0 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
MACHINE CODE	EQUIPMENT CODE								SEQ. NUMBER	SEPARATOR	PRODUCTION SITE	SERIAL SEQUENTIAL NUMBER										
PREFIX CONTROLLED BY CERN								CONTROLLED BY SUPPLIER OR CERN	-	CONTROLLED BY CERN	CONTROLLED BY SUPPLIER											
PART NUMBER													-	SERIAL NUMBER								

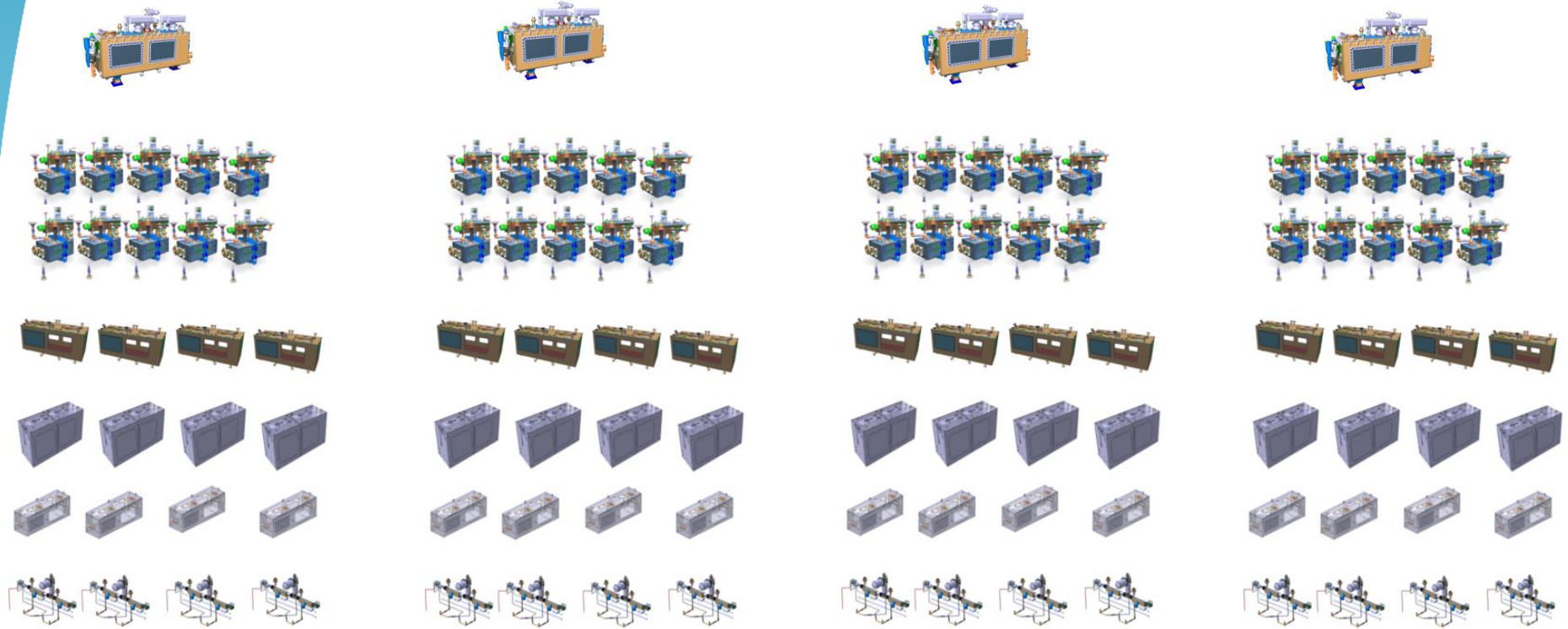
Item 

Asset(s) 

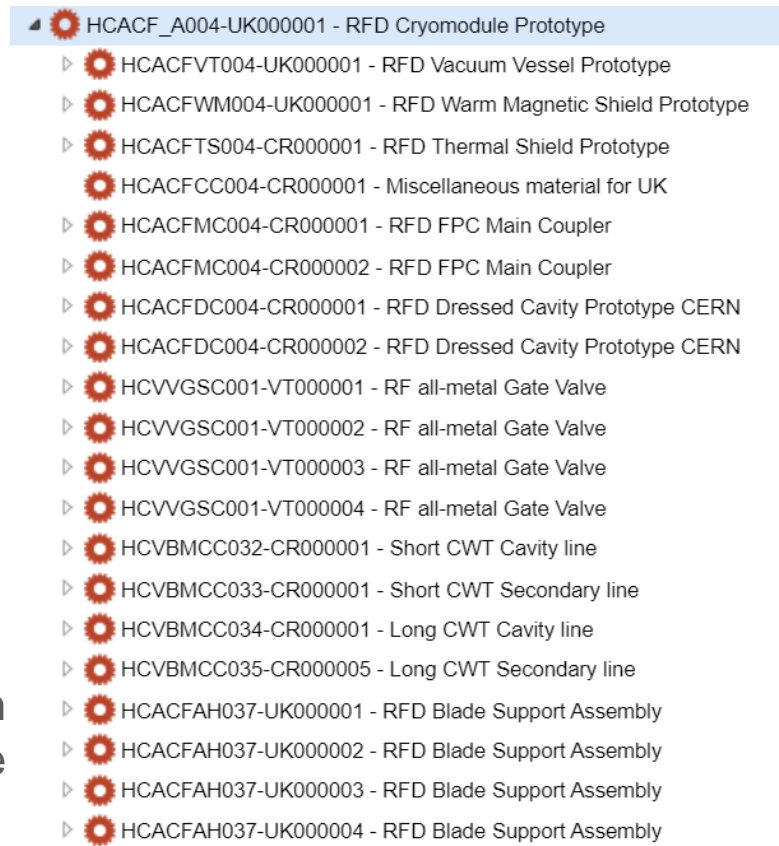
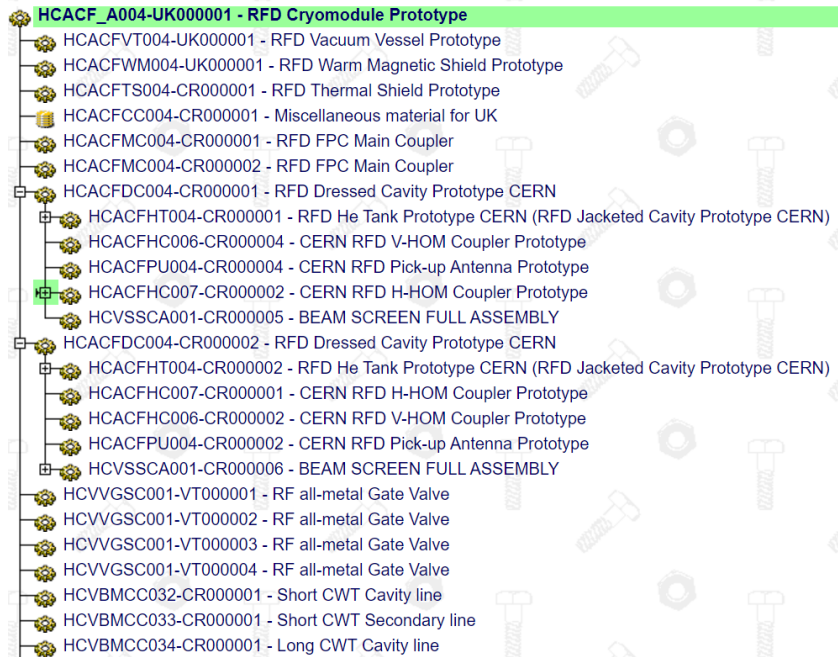
Equipment Identifier: HCACF_A004-UK000001 🔍
Other Identifier: None
Description: RFD Cryomodule Prototype

Main		Equipment data	Manufacturing	Operation	Non-conformities	Documents	History	Map
Actions: Edit View summary								
Physical								
Manufacturer	UK-2 Collaboration							
Resp. Technique	Manufacturing							
Status								
Other Identifier								
Parent Equipment								
Parent Slot								
Location								
State	Good	Service Unit	HL-WP4-UK					
Safety								
RP Classification								
Comments								
Design								
Item in ABS	RFD Cryomodule Prototype (ver:0)							
Audit								
Created on	2020-09-23	by	LQUAINSO					
Last modified on	2021-09-24	by	EAMJOB					
Responsible								

Traceability of components


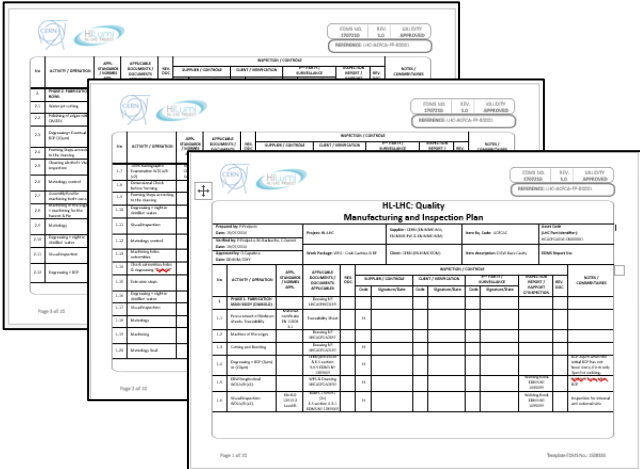


Traceability of components




MTF used to build the assembly tree of each equipment (subcomponents assembled to the main component)

From MIP to MTF – Production Follow-up

HL-LHC Quality Manufacturing and Inspection Plan

Page 1 of 12




Equipment Identifier: HCACFA004-CR00001
Other Identifier: CERN-DQW-ACFCA001
Description: DQW Bare Cavity (variant #1)

Manufacturer: CERN
Resp. Technique: Manufacturing
Status: Good
Parent Equipment: CERN-DQW-ACFCA001
Parent Slot: Good
Location: Good

Safety:
RP Classification:


Design:
Item in ABS: y/DQW Bare Cavity (variant #1) (ver.0)

Audit:
Created on: 2015-07-26 **by:** HGARCIAG
Last modified on: 2016-07-26 **by:** TKRASTEV
EDMS owner: HGARCIAG **EDMS group:** HL-LHC-ACFC-MTF



Workflow Diagram

Step ID	Name	Description	Status	Start	End
1	Colling and drying - Main Body	Colling and drying - Main Body	Accepted	01	01
2	E Beam Heating Insulation W/VA	E Beam Heating Insulation W/VA - Main Body (*)	Accepted	01	01
3	Visual inspection W/VA	Visual inspection W/VA (*)	Accepted	01	01
4	Photographic examination W/VA	Photographic examination W/VA (*)	Accepted	01	01
5	Forming - Main Body	Forming - Main Body	Accepted	01	01
6	Visual inspection after forming	Visual inspection after forming (*)	Accepted	01	01
7	Photology control after forming	Photology control after forming (*)	Accepted	01	01
8	Photology control final - Main Body (*)	Photology control final - Main Body (*)	Accepted	01	01
9	Photology control (*)	Photology control (*)	Accepted	01	01
10	Visual inspection	Visual inspection	Accepted	01	01
11	Photographic examination W/VA	Photographic examination W/VA (*)	Accepted	01	01
12	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
13	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
14	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
15	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
16	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
17	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
18	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
19	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
20	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
21	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
22	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
23	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
24	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
25	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
26	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
27	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
28	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
29	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
30	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
31	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
32	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
33	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
34	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
35	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
36	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
37	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
38	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
39	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
40	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
41	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
42	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
43	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
44	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
45	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
46	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
47	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
48	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
49	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01
50	Photographic examination W/VA & W/VA	Photographic examination W/VA & W/VA (*)	Accepted	01	01




Equipment Identifier: HCACFA004-CR00002
Other Identifier: CERN-DQW-ACFCA002
Description: DQW Bare Cavity (variant #1)

Manufacturer: CERN
Resp. Technique: Manufacturing
Status: Good
Parent Equipment: CERN-DQW-ACFCA002
Parent Slot: Good
Location: Good

Safety:
RP Classification:

Design:
Item in ABS: y/DQW Bare Cavity (variant #1) (ver.0)

Audit:
Created on: 2015-07-26 **by:** HGARCIAG
Last modified on: 2016-07-26 **by:** TKRASTEV
EDMS owner: HGARCIAG **EDMS group:** HL-LHC-ACFC-MTF




ITEM



ASSET (S)

H. Garcia Gavela - CERN-TRIUMF Use of MTF/Infor for HL-LHC

Production Follow-up and Storage of Manufacturing Data

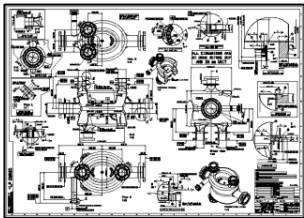
MANUFACTURING CHECKLIST									
NO.	DESCRIPTION	DATE	INITIALS	STATUS	REMARKS	DATE	INITIALS	STATUS	REMARKS
1	...								
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4	...								
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ENGINEERING SPECIFICATION	
DRESSED BULK NIOBIUM RADIO FREQUENCY CRAB CAVITIES	
<p>1.1. Description: Dressed Bulk Niobium Radio Frequency Crab Cavities</p> <p>1.2. Quantity: 100</p> <p>1.3. Material: Niobium</p> <p>1.4. Dimensions: See drawing</p> <p>1.5. Surface Finish: See drawing</p> <p>1.6. Heat Treatment: See drawing</p> <p>1.7. Inspection: See drawing</p> <p>1.8. Marking: See drawing</p> <p>1.9. Packaging: See drawing</p> <p>1.10. Storage: See drawing</p>	

Equipment Identifier: HCACFA004-CR000001	
Other Identifier: CERN-DQW-ACFA001	
Description: DQW Bare Cavity (variant #1)	
Physical	
Manufacturer	CERN
Brand/Technique	Manufacturing
Other Identifier	CERN-DQW-ACFA001
Parent Equipment	
Parent Slot	
Location	
State	Good MRC M01
Safety	
RF Classification	
Design	
Item in ABS	\$/DQW Bare Cavity (variant #1) (ver.0)
Created on	2015-07-26 by HGARCJAO
Last modified on	2016-07-26 by TRARATV
EDMS owner	HGARCJAO EDMS group: HL-LHC/ACF-MTF



Item ID	Description	Location	Status
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REPORT	
DQW DRESSED CAVITY STRENGTH ASSESSMENT	
<p>1.1. Description: DQW Dressed Cavity Strength Assessment</p> <p>1.2. Quantity: 100</p> <p>1.3. Material: Niobium</p> <p>1.4. Dimensions: See drawing</p> <p>1.5. Surface Finish: See drawing</p> <p>1.6. Heat Treatment: See drawing</p> <p>1.7. Inspection: See drawing</p> <p>1.8. Marking: See drawing</p> <p>1.9. Packaging: See drawing</p> <p>1.10. Storage: See drawing</p>	
Created on	2015-07-26 by HGARCJAO
Last modified on	2016-07-26 by TRARATV
EDMS owner	HGARCJAO EDMS group: HL-LHC/ACF-MTF



ITEM

PROCEDURE	
ACFA - BARE CAVITIES	
PROCEDURE FOR CHEMICAL POLISHING OF NIOBIUM CRAB CAVITIES	
<p>1.1. Description: Procedure for chemical polishing of Niobium Crab Cavities</p> <p>1.2. Quantity: 100</p> <p>1.3. Material: Niobium</p> <p>1.4. Dimensions: See drawing</p> <p>1.5. Surface Finish: See drawing</p> <p>1.6. Heat Treatment: See drawing</p> <p>1.7. Inspection: See drawing</p> <p>1.8. Marking: See drawing</p> <p>1.9. Packaging: See drawing</p> <p>1.10. Storage: See drawing</p>	
Created on	2015-07-26 by HGARCJAO
Last modified on	2016-07-26 by TRARATV
EDMS owner	HGARCJAO EDMS group: HL-LHC/ACF-MTF

Equipment Identifier: HCACFA004-CR000002	
Other Identifier: CERN-DQW-ACFA002	
Description: DQW Bare Cavity (variant #1)	
Physical	
Manufacturer	CERN
Brand/Technique	Manufacturing
Other Identifier	CERN-DQW-ACFA002
Parent Equipment	
Parent Slot	
Location	
State	Good MRC M01
Safety	
RF Classification	
Design	
Item in ABS	\$/DQW Bare Cavity (variant #1) (ver.0)
Created on	2015-07-26 by HGARCJAO
Last modified on	2016-07-26 by TRARATV
EDMS owner	HGARCJAO EDMS group: HL-LHC/ACF-MTF



ASSET (S)

Nonconformities

Nonconformity Report (NCR) EDMS 1501109

HL-LHC Quality Non-Conformity Report

NCR Description:
The NCR is a report of a non-conformance (NC) found during the manufacturing process. It is used to track the status of the NC and to ensure that the root cause is identified and corrected. The NCR is created by the Manufacturing Folder (MF) and is linked to the specific step in the Manufacturing Folder (MF) where the NC was found. The NCR is then reviewed and approved by the Quality Assurance (QA) department. The NCR is then closed when the root cause is identified and corrected, and the NC is resolved.

NCR Details:
NCR No: 1501109
Date of Issue: 2011-12-07
Step: 15
Step Description: Radiographic examination EB17-HV (MIP 21) (*)

NCR Status:
Status: In Progress

HL-LHC Quality Non-Conformity Report

NCR Description:
The NCR is a report of a non-conformance (NC) found during the manufacturing process. It is used to track the status of the NC and to ensure that the root cause is identified and corrected. The NCR is created by the Manufacturing Folder (MF) and is linked to the specific step in the Manufacturing Folder (MF) where the NC was found. The NCR is then reviewed and approved by the Quality Assurance (QA) department. The NCR is then closed when the root cause is identified and corrected, and the NC is resolved.

NCR Details:
NCR No: 1501109
Date of Issue: 2011-12-07
Step: 15
Step Description: Radiographic examination EB17-HV (MIP 21) (*)

NCR Status:
Status: In Progress

Nonconformity via MTF

Equipment Identifier: HCACFCA005-UP000001
Other Identifier: None
Description: AUP RFD Bare Cavity Prototype

Main Made of Equipment data Manufacturing Operation Non-conformities Documents History Map

Actions: Add extra step

Workflow Diagram
No workflow diagram is defined for this equipment

Step ID	R/E	Other name	Description	Status	Result	NC	Last Repeated
0	0		MIP Attachment	Done	Ok		
1	0		Traceability of materials (*)	Accepted	Ok		
5	0		Visual inspection EB18-LV (MIP 14) (*)	In Progress			
10	0		Visual inspection EB17-HV (MIP 20) (*)	In Progress			
15	0		Radiographic examination EB17-HV (MIP 21) (*)	Pending			
20	0		Dimensional Control WHOM Por Weldment (MIP 24) (*)	In Progress			
25	0		Visual Inspection EB15-HV (MIP 32) (*)	In Progress			
30	0		Radiographic examination EB15-HV (MIP 33) (*)	In Progress			
35	0		Visual Inspection EB48-HV (MIP 39) (*)	In Progress			
40	0		Radiographic examination EB48-HV (MIP 40) (*)	In Progress			
45	0		Visual Inspection EB14-HV (MIP 47) (*)	In Progress			
50	0		Radiographic examination EB14-HV (MIP 48) (*)	In Progress			
55	0		Visual Inspection EB16-HV (MIP 54) (*)	In Progress			

A Nonconformity Report is attached to the step in which the deviation was found (Manufacturing Folder) and it is part of the Quality Dossier of the Project

Decision about Non Conformity

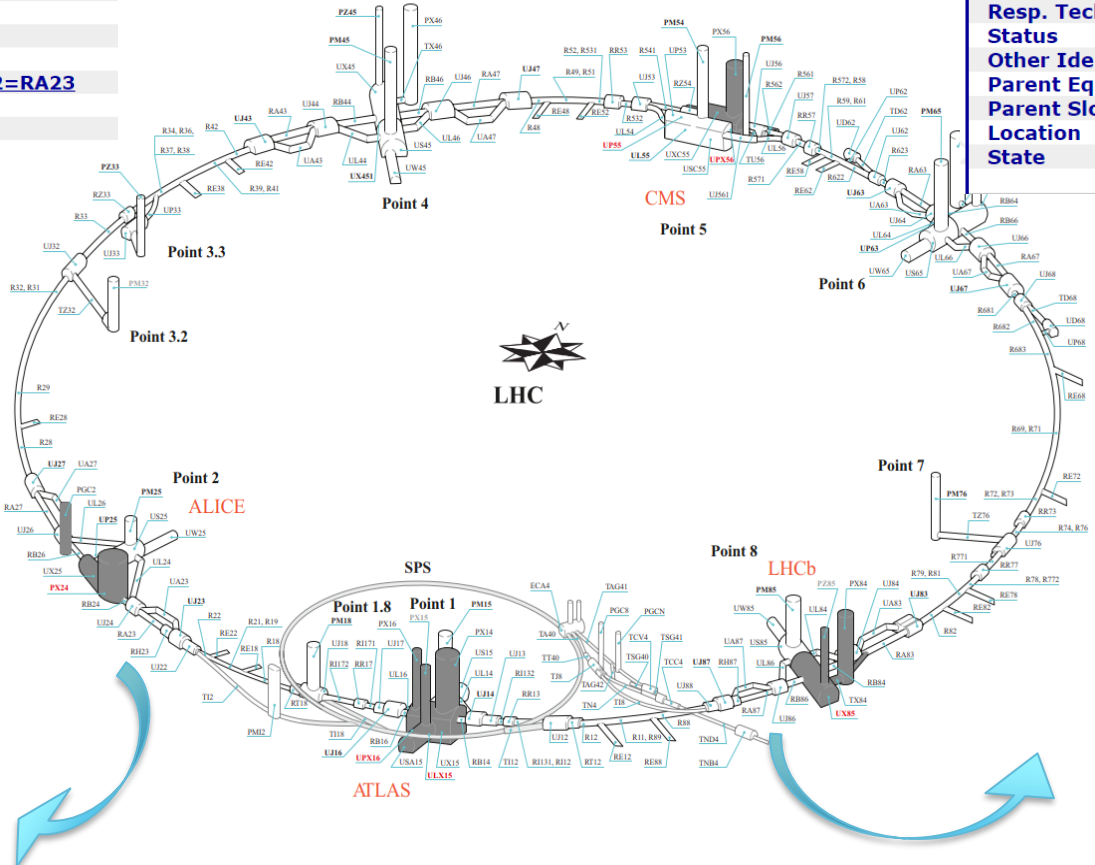
Repair	<input type="checkbox"/>	Regrade	<input type="checkbox"/>	Scrap	<input type="checkbox"/>	Return	<input type="checkbox"/>	Concession	<input type="checkbox"/>
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What goes where in the machine

Manufacturer	CERN
Resp. Technique	
Status	Installed
Other Identifier	
Parent Equipment	
Parent Slot	TDIS.A4L2=RA23
Location	RA23
State	Good

Manufacturer	CERN
Resp. Technique	
Status	Installed
Other Identifier	
Parent Equipment	
Parent Slot	TDIS.A4R8=RA87
Location	RA87
State	Good



Equipment Identifier: HCTDIS_002-CR000001
 Other Identifier: None
 Description: Beam Absorber for Injection Segmented (Pre-series P2)

Manufacturer	CERN
Resp. Technique	Installed
Other Identifier	
Parent Equipment	
Parent Slot	TDIS.A4L2=RA23
Location	RA23
State	Good
Service Unit	TD1

RP Classification

Design Item in ABS: y/Beam Absorber for Injection Segmented Pre Series (ver:0)

Created on: 2018-04-24 by BEALHEID
 Last modified on: 2022-07-08 by EDGRNHE

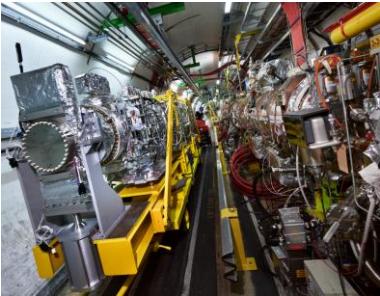
Equipment Identifier: HCTDIS_001-CR000001
 Other Identifier: None
 Description: Beam Absorber for Injection Segmented (serie)

Manufacturer	CERN
Resp. Technique	Installed
Other Identifier	
Parent Equipment	
Parent Slot	TDIS.A4R8=RA87
Location	RA87
State	Good
Service Unit	TD1

RP Classification

Design Item in ABS: y/Beam Absorber for Injection Segmented Series (ver:0)

Created on: 2018-08-01 by BEALHEID
 Last modified on: 2022-09-15 by RSEDBB



H. Garcia Gavela - CERN-TRIUMF Use of MTF/Intor for HL-LHC

MTF

- MTF (Equipment management Folder formerly **M**anufacturing and **T**esting **F**older) is the dedicated tool for the follow-up of Production/QC activities and the storage of documentation during this phase of the project (All the Manufacturing & Test data).
- MTF is an integral part of EDMS. Documents uploaded to MTF will become EDMS docs, documents already in EDMS can be attached to MTF.
- Handling and storage of manufacturing and test data (including nonconformities) of the equipment.
- MIP (Manufacturing & Inspection Plan) is the main input in order to build the MTF of the equipment.

MTF



Welcome to the MTF Application Homepage

- EQUIPMENT**
 - Access Equipment Data
 - Register New Equipment
 - Generate Properties Report
 - Generate Slots Properties Report
 - Generate Steps Report (by part number)
 - Generate Steps Report (eqp. + structure)
 - Generate NCR Overview (by profile)
 - Delete Object
- INSTALLATION**
 - Find an LHC Location
 - LINAC4 Locations
 - Access Location Data
 - QRL Installation Dashboard
 - Magnet Installation Dashboard
 - LHC Circular Dashboard
- MY MTF**
 - My search and report criteria
 - My custom reports
- NEWS**
 - 2008-04-01**
Version 4.0
New functionalities... [more](#)
 - 2007-08-23**
Version 3.9.6
New functionalities... [more](#)
 - 2007-03-20**
Version 3.9.5
New functionalities... [more](#)
- PRODUCTION SITES**
 - Access Production Sites Data
 - Create New Production Site
- MANAGEMENT**
 - Access Profiles Data
- ADMINISTRATION**
 - Import Standard MTFs from AX Application

Link to MTF -

<https://edms5.cern.ch/pls/asbuilt/mtf.home?cookie=25019603>

Equipment Folder : Main Info

Equipment Identifier: HCACFCM003-UK000001
Other Identifier: None
Description: DQW Cold Magnetic Shield Series

Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map	
Actions: Edit View summary								
Physical								
Manufacturer	UK-2 Collaboration							
Resp. Technique	Manufacturing							
Status								
Other Identifier								
Parent Equipment								
Parent Slot								
Location								
State	Good						MRC	AC01
Safety								
RP Classification								
Comments								
Design								
Item in ABS	▶ DQW Cold Magnetic Shield Series (ver.0)							
Audit								
Created on	2018-11-11			by	DGOMEZTR			
Last modified on	2020-04-20			by	BEALMEID			
EDMS owner	DGOMEZTR			EDMS group	HL-LHC-WP4-MTF			

Equipment Folder : Main Info

Equipment Identifier: HCACFCM003-UK000002
Other Identifier: None
Description: DQW Cold Magnetic Shield Series

Main	Made of	Equipment data	Manufacturing	Operation	Non-conformities	Documents	History	Map
Actions: Edit View summary								
Physical								
Manufacturer	UK-2 Collaboration							
Resp. Technique	Manufacturing							
Status								
Other Identifier								
Parent Equipment								
Parent Slot								
Location								
State	Good						MRC	AC01
Safety								
RP Classification								
Comments								
Design								
Item in ABS	▶ DQW Cold Magnetic Shield Series (ver.0)							
Audit								
Created on	2018-11-11			by	DGOMEZTR			
Last modified on	2020-04-20			by	BEALMEID			
EDMS owner	DGOMEZTR			EDMS group	HL-LHC-WP4-MTF			



Outline

- EDMS and MTF;
- **Item vs Asset;**
- MIP and MTF;
- MTF: Assets, Assemblies and Steps;
- Manufacturing Documents;
- Handling Nonconformities.

Item vs Asset



Item

- The concept;
- Associated with technical specifications, drawings, conceptual specification, manufacturing procedures, test procedures;
- Everything needed before production.



Asset

- The real thing;
- Associated with all the manufacturing documentation (e. g. Metrological Reports, Material Certificates, Welds inspection ...);
- Manufacturing Records.



One item can have one or more assets!

Outline

- EDMS and MTF;
- Item vs Asset;
- MIP and MTF;
- MTF Assets and Assemblies, Steps;
- Manufacturing Documents;

Manufacturing Inspection Plan - MIP

Manufacturing and Inspection Plan

PROCEDURE: 1563887

CERN		HiLumi HL-LHC PROJECT		EDMS NO. 0000000	REV. 0.0	VALIDITY DRAFT					
REFERENCE: LHC-EQCOD-FP-XXXXX											
HL-LHC: Quality Manufacturing and Inspection Plan											
Prepared by: N. Surname Date: DD/MM/YYYY	Project: HL-LHC	Supplier:	Item Eq. Code:	Asset Code (LHC Part Identifier):							
Verified by: N. Surname Date: DD/MM/YYYY	Work Package: WPXX	Client: CERN (XX-NYXVZ)	Item description:	EDMS Report No.:							
Approved by: N. Surname Date: DD/MM/YYYY											
No	ACTIVITY / OPERATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES	REV. DOC.	INSPECTION / CONTRÔLE				NOTES / COMMENTAIRES		
					SUPPLIER / CONTRÔLE	CLIENT / VÉRIFICATION	3 rd PARTY / SURVEILLANCE	INSPECTION REPORT / RAPPORT D'INSPECTION		REV. DOC.	
1	NAME OF OPERATION				Code	Signature/Date	Code	Signature/Date	Code	Signature/Date	
1.1	Operation step (Fabrication or control etc...)										
1.2	Operation step (Fabrication or control etc...)										
1.3	Operation step (Fabrication or control etc...)										
2	NAME OF OPERATION										
2.1	Operation step (Fabrication or control etc...)										
2.2	Operation step (Fabrication or control etc...)										
2.3	Operation step (Fabrication or control etc...)										

Page 1 of 2 Template EDMS No.: 1528333

CERN		HiLumi HL-LHC PROJECT		EDMS NO. 0000000	REV. 0.0	VALIDITY DRAFT				
REFERENCE: LHC-EQCOD-FP-XXXXX										
HL-LHC: Quality Manufacturing and Inspection Plan										
Prepared by: N. Surname Date: DD/MM/YYYY	Project: HL-LHC	Supplier:	Item Eq. Code:	Asset Code (LHC Part Identifier):						
Verified by: N. Surname Date: DD/MM/YYYY	Work Package: WPXX	Client: CERN (XX-NYXVZ)	Item description:	EDMS Report No.:						
Approved by: N. Surname Date: DD/MM/YYYY										
No	ACTIVITY / OPERATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES	REV. DOC.	INSPECTION / CONTRÔLE				NOTES / COMMENTAIRES	
					SUPPLIER / CONTRÔLE	CLIENT / VÉRIFICATION	3 rd PARTY / SURVEILLANCE	INSPECTION REPORT / RAPPORT D'INSPECTION		REV. DOC.
2.4	Operation step (Fabrication or control etc...)									
2.5	Operation step (Fabrication or control etc...)									
*Ajouter en double (dans les deux sens) / Ajouter autour de lignes que nécessaire										
NOTE:		SUPPLIER:		CLIENT:		3rd PARTY (if any):				
H = HOLD POINT / Point d'arrêt (A)		Approved by: N. Surname		Approved by: N. Surname		Approved by: N. Surname				
N = NOTIFICATION POINT / Point d'information (I)		Signature:		Signature:		Signature:				
W = WITNESS POINT / Inspection sur Site (S)		Date: DD/MM/YYYY		Date: DD/MM/YYYY		Date: DD/MM/YYYY				
R = REVIEW AND APPROVAL OF REPORT / Révision de la Documentation										
<ol style="list-style-type: none"> H (Hold Point): CERN, or its authorized representative, is informed 3 working days in advance that a specific step has been completed and that the following step in the approved work-flow will be performed. A Notification Point does not affect the work-flow. Work can continue without CERN, or its authorized representative, input. N (Notification Point): CERN, or its authorized representative, is informed that a specific step has been completed. The work-flow is stopped until CERN, or its authorized representative, provides a Hold Point Clearance. The clearance is provided within 5 working days upon submission of the quality control documentation relative to the performed step. In case of clearance the work-flow can continue. In case of rejection, a recovery plan shall be discussed with CERN and submitted to CERN for final approval within 10 working days. W (Witness Point): CERN, or its authorized representative, intends to attend any specific step of the production. The supplier will notify the client with 10 working days in advance that the activity will be performed. R (Review): The quality records will be reviewed. 										

Page 2 of 2 Template EDMS No.: 1528333

CERN		HiLumi HL-LHC PROJECT		EDMS NO. 1563887	REV. 0.0	VALIDITY DRAFT
REFERENCE: LHC-EQCOD-FP-XXXXX						
HL-LHC: Manufacturing & Inspection Plan						
<p>Supplier: Will issue the Manufacturing & Inspection Plan (MIP) for the equipment to be produced and will be responsible to ensure that the equipment meets the established requirements. It can be internal, external or subcontracted.</p> <p>WFE: Will review the MIP and will follow up the process during the Fabrication, Assembly and Verification (AV) phase.</p> <p>WPE: Will assess the content of the MIP together with the WFE and will approve it.</p> <p>PO: Will support the process and provide assistance at any step.</p> <p>As soon as the design of the equipment is finished and before starting the Fabrication, Assembly and Verification phase of the equipment.</p> <p>MIP Template: EDMS, MTF</p>						
<p>A Supplier: Preparation: Once the design of the equipment is finalized and all requirements are defined, the supplier will prepare the MIP of the equipment. The MIP will contain the sequence of manufacturing steps required to produce the equipment and the Quality Controls that need to be performed throughout the process in order to ensure that the equipment meets the requirements. These inspections are clearly defined in the MIP (at which step they are performed). Each step of the MIP has to be referred to the applicable project documentation (drawing, manufacturing/testing procedures, etc.) in order to ensure the full traceability. If not indicated in the Functional or Technical Specification of the equipment, the supplier shall provide the standards or internal procedures that will be used in the different steps.</p> <p>B WFE, WPE, PO: Check Points Identification: The MIP is checked and at the same time the different main manufacturing or inspection steps (either) are identified as Notification Point (N), Hold Point (H) or Review (R). The proposed MIP is checked in order to ensure that no step is missing and the verification to be carried out is in line with the project requirements. Each step of the MIP is identified as follows:</p> <ul style="list-style-type: none"> H (Hold Point): CERN, or its authorized representative, is informed 3 working days in advance that a specific step has been completed and that the following step in the approved work-flow will be performed. A Notification Point does not affect the work-flow. Work can continue without CERN, or its authorized representative, input. N (Notification Point): CERN, or its authorized representative, is informed that a specific step has been completed. The work-flow is stopped until CERN, or its authorized representative, provides a Hold Point Clearance. The clearance is provided within 5 working days upon submission of the QC documentation relative to the performed step. In case of clearance the work-flow can continue. In case of rejection, a recovery plan shall be discussed with CERN and submitted to CERN for final approval. R (Review): The quality records will be reviewed. <p>C WPE: Approval: The WPE will approve the proposed MIP and give the go-ahead to the supplier to start the production.</p>						

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TEMPLATE: 1528333

CERN		HiLumi HL-LHC PROJECT		EDMS NO. 0000000	REV. 0.0	VALIDITY DRAFT					
REFERENCE: LHC-EQCOD-FP-XXXXX											
HL-LHC: Quality Manufacturing and Inspection Plan											
Prepared by: N. Surname Date: DD/MM/YYYY	Project: HL-LHC	Supplier:	Item Eq. Code:	Asset Code (LHC Part Identifier):							
Verified by: N. Surname Date: DD/MM/YYYY	Work Package: WPXX	Client: CERN (XX-NYXVZ)	Item description:	EDMS Report No.:							
Approved by: N. Surname Date: DD/MM/YYYY											
No	ACTIVITY / OPERATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES	REV. DOC.	INSPECTION / CONTRÔLE				NOTES / COMMENTAIRES		
					SUPPLIER / CONTRÔLE	CLIENT / VÉRIFICATION	3 rd PARTY / SURVEILLANCE	INSPECTION REPORT / RAPPORT D'INSPECTION		REV. DOC.	
1	NAME OF OPERATION				Code	Signature/Date	Code	Signature/Date	Code	Signature/Date	
1.1	Operation step (Fabrication or control etc...)										
1.2	Operation step (Fabrication or control etc...)										
1.3	Operation step (Fabrication or control etc...)										
2	NAME OF OPERATION										
2.1	Operation step (Fabrication or control etc...)										
2.2	Operation step (Fabrication or control etc...)										
2.3	Operation step (Fabrication or control etc...)										

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CERN		HiLumi HL-LHC PROJECT		EDMS NO. 1563887	REV. 0.0	VALIDITY DRAFT
REFERENCE: LHC-EQCOD-FP-XXXXX						
HL-LHC: Manufacturing & Inspection Plan						
<p>Supplier: Will issue the Manufacturing & Inspection Plan (MIP) for the equipment to be produced and will be responsible to ensure that the equipment meets the established requirements. It can be internal, external or subcontracted.</p> <p>WFE: Will review the MIP and will follow up the process during the Fabrication, Assembly and Verification (AV) phase.</p> <p>WPE: Will assess the content of the MIP together with the WFE and will approve it.</p> <p>PO: Will support the process and provide assistance at any step.</p> <p>As soon as the design of the equipment is finished and before starting the Fabrication, Assembly and Verification phase of the equipment.</p> <p>MIP Template: EDMS, MTF</p>						
<p>A Supplier: Preparation: Once the design of the equipment is finalized and all requirements are defined, the supplier will prepare the MIP of the equipment. The MIP will contain the sequence of manufacturing steps required to produce the equipment and the Quality Controls that need to be performed throughout the process in order to ensure that the equipment meets the requirements. These inspections are clearly defined in the MIP (at which step they are performed). Each step of the MIP has to be referred to the applicable project documentation (drawing, manufacturing/testing procedures, etc.) in order to ensure the full traceability. If not indicated in the Functional or Technical Specification of the equipment, the supplier shall provide the standards or internal procedures that will be used in the different steps.</p> <p>B WFE, WPE, PO: Check Points Identification: The MIP is checked and at the same time the different main manufacturing or inspection steps (either) are identified as Notification Point (N), Hold Point (H) or Review (R). The proposed MIP is checked in order to ensure that no step is missing and the verification to be carried out is in line with the project requirements. Each step of the MIP is identified as follows:</p> <ul style="list-style-type: none"> H (Hold Point): CERN, or its authorized representative, is informed 3 working days in advance that a specific step has been completed and that the following step in the approved work-flow will be performed. A Notification Point does not affect the work-flow. Work can continue without CERN, or its authorized representative, input. N (Notification Point): CERN, or its authorized representative, is informed that a specific step has been completed. The work-flow is stopped until CERN, or its authorized representative, provides a Hold Point Clearance. The clearance is provided within 5 working days upon submission of the QC documentation relative to the performed step. In case of clearance the work-flow can continue. In case of rejection, a recovery plan shall be discussed with CERN and submitted to CERN for final approval. R (Review): The quality records will be reviewed. <p>C WPE: Approval: The WPE will approve the proposed MIP and give the go-ahead to the supplier to start the production.</p>						

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CERN		HiLumi HL-LHC PROJECT		EDMS NO. 0000000	REV. 0.0	VALIDITY DRAFT				
REFERENCE: LHC-EQCOD-FP-XXXXX										
HL-LHC: Quality Manufacturing and Inspection Plan										
Prepared by: N. Surname Date: DD/MM/YYYY	Project: HL-LHC	Supplier:	Item Eq. Code:	Asset Code (LHC Part Identifier):						
Verified by: N. Surname Date: DD/MM/YYYY	Work Package: WPXX	Client: CERN (XX-NYXVZ)	Item description:	EDMS Report No.:						
Approved by: N. Surname Date: DD/MM/YYYY										
No	ACTIVITY / OPERATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES	REV. DOC.	INSPECTION / CONTRÔLE				NOTES / COMMENTAIRES	
					SUPPLIER / CONTRÔLE	CLIENT / VÉRIFICATION	3 rd PARTY / SURVEILLANCE	INSPECTION REPORT / RAPPORT D'INSPECTION		REV. DOC.
1.4	Operation step (Fabrication or control etc...)									
1.5	Operation step (Fabrication or control etc...)									
*Ajouter en double (dans les deux sens) / Ajouter autour de lignes que nécessaire										
NOTE:		SUPPLIER:		CLIENT:		3rd PARTY (if any):				
H = HOLD POINT / Point d'arrêt (A)		Approved by: N. Surname		Approved by: N. Surname		Approved by: N. Surname				
N = NOTIFICATION POINT / Point d'information (I)		Signature:		Signature:		Signature:				
W = WITNESS POINT / Inspection sur Site (S)		Date: DD/MM/YYYY		Date: DD/MM/YYYY		Date: DD/MM/YYYY				
R = REVIEW AND APPROVAL OF REPORT / Révision de la Documentation										
<ol style="list-style-type: none"> H (Hold Point): CERN, or its authorized representative, is informed 3 working days in advance that a specific step has been completed and that the following step in the approved work-flow will be performed. A Notification Point does not affect the work-flow. Work can continue without CERN, or its authorized representative, input. N (Notification Point): CERN, or its authorized representative, is informed that a specific step has been completed. The work-flow is stopped until CERN, or its authorized representative, provides a Hold Point Clearance. The clearance is provided within 5 working days upon submission of the quality control documentation relative to the performed step. In case of clearance the work-flow can continue. In case of rejection, a recovery plan shall be discussed with CERN and submitted to CERN for final approval within 10 working days. W (Witness Point): CERN, or its authorized representative, intends to attend any specific step of the production. The supplier will notify the client with 10 working days in advance that the activity will be performed. R (Review): The quality records will be reviewed. 										



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Manufacturing Inspection Plan - MIP

Verification and approval following HL-LHC documentation approval process.

Sequence of required steps to manufacture the equipment (both fabrication and QC activities).

EDMS NO. 000000	REV. 0.0	VALIDITY DRAFT
REFERENCE: LHC-EQCOD-FP-XXXX		

HL-LHC: Quality Manufacturing and Inspection Plan

Prepared by: N. Surname Date: DD/MM/20YY		Project: HL-LHC	Supplier:	Item Eq. Code:	Asset Code (LHC Part Identifier):
Verified by: N. Surname Date: DD/MM/20YY		Work Package: WPXX	Client: CERN (XY-XYZ-XYZ)	Item description:	EDMS Report No:
Approved by: N. Surname Date: DD/MM/20YY					

No	ACTIVITY / OPERATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES	REV. DOC.	INSPECTION / CONTRÔLE									
					SUPPLIER / CONTRÔLE		CLIENT / VÉRIFICATION		3 RD PARTY / SURVEILLANCE		INSPECTION REPORT / RAPPORT D'INSPECTION	REV. DOC.	NOTES / COMMENTAIRES	
					Code	Signature/Date	Code	Signature/Date	Code	Signature/Date				
1	NAME OF OPERATION													
1.1	Operation step (fabrication or control either)													
1.2	Operation step (fabrication or control either)													
1.3	Operation step (fabrication or control either)													
2	NAME OF OPERATION													
2.1	Operation step (fabrication or control either)													
2.2	Operation step (fabrication or control either)													
2.3	Operation step (fabrication or control either)													

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Template EDMS No.: 1528333

Applicable documentation which supports the related activity such as drawings, procedures, standards, guidelines, acceptance criteria, checklists, etc.

Codification of the activity by the client (see next slide)

Manufacturing Inspection Plan - MIP

- The different activities will be categorized by the client during the verification and approval process. The assigned categories shall be respected along the process (N, H, W, R or a combination of those).

No	ACTIVITY / OPERATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES	REV. DOC.	INSPECTION / CONTRÔLE						REV. DOC.	NOTES / COMMENTAIRES
					SUPPLIER / CONTRÔLE		CLIENT / VÉRIFICATION		3 rd PARTY / SURVEILLANCE			
					Code	Signature/Date	Code	Signature/Date	Code	Signature/Date		
2.4	Operation step (fabrication or control either)											
2.5	Operation step (fabrication or control either)											
*												

EDMS NO. 0000000 REV. 0.0 VALIDITY DRAFT
REFERENCE: LHC-EQCDD-FP-3000X

NOTE: HOLD POINT / Point d'arrêt (A) SUPPLIER: Approved by: N. Surname CLIENT: Approved by: N. Surname 3rd PARTY (if any): Approved by: N. Surname

We can set these categories on MTF. Since parallel activities are not allowed in the platform, it is not recommended to stop the workflow. Therefore, we can at least indicate the activity code in the name of the activity as per the MIP.

NOTE:

H = HOLD POINT / Point d'arrêt (A)

N = NOTIFICATION POINT / Point d'information (I)

W = WITNESS POINT / Inspection sur Site (S)

R = REVIEW AND APPROVAL OF REPORT / Révision de la Documentation

SUPPLIER:

Approved by: N. Surname

Signature:

Date: DD/MM/20YY

CLIENT:

Approved by: N. Surname

Signature:

Date: DD/MM/20YY

3rd PARTY (if any):

Approved by: N. Surname

Signature:

Date: DD/MM/20YY

- N (Notification Point):** CERN, or its authorized representative, is informed 5 working days in advance that a specific step has been completed and that the following step in the approved work-flow will be performed. A Notification Point does not affect the work-flow. Work can continue without CERN, or its authorized representative, reply.
- H (Hold Point):** CERN, or its authorized representative, is informed that a specific step has been completed. The work-flow is stopped until CERN, or its authorized representative, provides a Hold Point Clearance. The clearance is provided within 5 working days upon submission of the quality control documentation relative to the performed step. In case of clearance the work-flow can continue. In case of rejection, a recovery plan shall be discussed with CERN and submitted to CERN for final approval within 10 working days.
- W (Witness Point):** CERN, or its authorized representative, intends to attend any specific step of the production. The supplier will notify the client with 10 working days in advance that the activity will be performed.
- R (Review):** The quality records will be reviewed.

Manufacturing Inspection Plan - MIP

- MTF shall be the Electronic MIP (e-MIP). We will extract from the MIP those steps that are relevant for the production and will have documentation associated to build the MTF.
- There is no stopper to have the full MIP on MTF, however from practical point of view it is highly recommended to have a MTF Workflow more simplified (easier management).
- Intermediate steps are fully necessary to check that requirements are being met but we can just leave the final step, which confirms that requirements are achieved.

Example:

No	ACTIVITY / OPÉRATION	APPL. STANDARDS / NORMES APPL.	APPLICABLE DOCUMENTS / DOCUMENTS APPLICABLES
3	MACHINING		LHCMCBXFA002
1.1	Vast machining		
1.2	Dimensional check		
1.3	Intermediate machining		
2.1	Dimensional check		
2.2	Fine machining		
2.3	Final dimensional check		
4	WELDING		
2.4	Edges preparation		WPS / WPQR
2.5	Welding W12		

MIP



MTF

5	Traceability of materials
10	Dimensional control after fine machining

Outline

- EDMS and MTF;
- Item vs Asset;
- MIP and MTF;
- **MTF: Assets, Assemblies, Steps;**
- Manufacturing Documents;

Access to MTF

We may access to the MTF of each asset through EDMS, Equipment Search (1), or directly from MTF Application Homepage (2).

1

Identifier: Type:

Range from: to: Status:

Description: Usage:

Location:

Resp. Technique:

Part Number: - Click for Part Numbers list

Manufacturer: Click for Manufacturer's list

2



Page 1 : Results 1 ... 15 of 15

Type	Part Identifier	Manufacturer	Status
Used	Description	Other Identifier	Location
✓	HCACFCM001-S9000001 DQW Cold Magnetic Shield (Variant #1)	STFC	Accepted SPS
✓	HCACFCM001-S9000002 DQW Cold Magnetic Shield (Variant #1)	STFC	Accepted SPS
	HCACFCM002-S9000001 RFD Cold Magnetic Shield (Variant #2)	STFC	Manufacturing
	HCACFCM002-S9000002 RFD Cold Magnetic Shield (Variant #2)	STFC	Manufacturing
	HCACFCM003-UK000001 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000002 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000003 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000004 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000005 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000006 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000007 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000008 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000009 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000010 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000011 DQW Cold Magnetic Shield Series	UK2C	Manufacturing

Page 1



Access to MTF

- From EDMS - <https://edms.cern.ch/ui/#!/master/portal/tab?home>



MTF can be only used with a CERN Nice Account
Externals to apply for one!

The screenshot displays the EDMS portal interface. At the top, there is a navigation bar with 'Home', 'Equipment', 'Buildings & Sites', 'Safety', and 'CAD'. Below this, there are icons for 'Browse', 'Document search', and 'Register Import Request'. A central box highlights 'Other applications' with 'CDD', 'MTF', and 'Infor EAM' listed below it. To the right, there is a 'News' section with a date of 'September 21, 2016'. At the bottom, there is a 'Please, identify yourself:' login form with fields for 'Login:' and 'Password*', and 'Ok' and 'Clear' buttons. A note below the form states: '*if your EDMS and NICE logins are the same, you can use your NICE password. Reminder: you have agreed to comply with the CERN Computing Rules'. The footer includes the CERN logo and the text '© CERN - 2016-11-22 11:30:43'.

- From MTF - <https://edms5.cern.ch/asbuilt/plsql/mtf.home?cookie=15935572>

Access to MTF

Items/Assets?

We can see the number of assets (physical entity/ies produced from one design) that belong to an item (conceptual entity).

How we may see the assets?

We introduce the name of the item and therefore we will see the number of assets that will be manufactured from this item.

Identifier: Type:

Range from: to Status:

Description: Usage:

Location:

Resp. Technique:

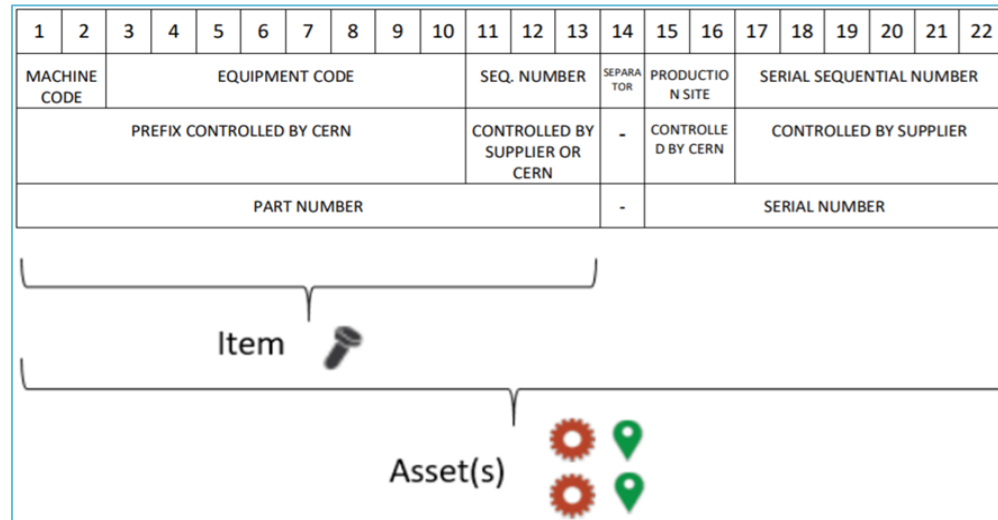
Part Number: - Click for Part Numbers list

Manufacturer: Click for Manufacturer's list

Page 1 : Results 1 ... 15 of 15

Type	Part Identifier	Manufacturer	Status
Used	Description	Other Identifier	Location
✓	HCACFCM001-S9000001 DQW Cold Magnetic Shield (Variant #1)	STFC	Accepted SPS
✓	HCACFCM001-S9000002 DQW Cold Magnetic Shield (Variant #1)	STFC	Accepted SPS
	HCACFCM002-S9000001 RFD Cold Magnetic Shield (Variant #2)	STFC	Manufacturing
	HCACFCM002-S9000002 RFD Cold Magnetic Shield (Variant #2)	STFC	Manufacturing
	HCACFCM003-UK000001 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000002 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000003 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000004 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000005 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000006 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000007 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000008 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000009 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000010 DQW Cold Magnetic Shield Series	UK2C	Manufacturing
	HCACFCM003-UK000011 DQW Cold Magnetic Shield Series	UK2C	Manufacturing

Page 1



MTF Assets

Each asset will have its Manufacturing and Testing Folder (MTF), where all documentation/data generated during the FAV & Installation will be stored.

Equipment Folder : Main Info

Equipment Identifier: HCACFCM003-UK000001
Other Identifier: None
Description: DQW Cold Magnetic Shield Series

Main			
Actions : Edit View summary			
Physical			
Manufacturer	UK-2 Collaboration		
Resp. Technique			
Status	Manufacturing		
Other Identifier			
Parent Equipment			
Parent Slot			
Location			
State	Good	MRC	AC01
Safety			
RP Classification			
Comments			
Design			
Item in ABS	▶ DQW Cold Magnetic Shield Series (ver.0)		
Audit			
Created on	2018-11-11	by	DGOMEZTR
Last modified on	2020-04-20	by	BEALMEID
EDMS owner	DGOMEZTR	EDMS group	HL-LHC-WP4-MTF

If you have the access rights, you can use the 'Edit' button to change the status, manufacturer, state and other information about equipment.

Main information of the asset

Equipment Folder : Main Info

Equipment Identifier: HCACFCM003-UK000001
Other Identifier: None
Description: DQW Cold Magnetic Shield Series

Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map
Actions : Edit View summary							
Physical							
Manufacturer	UK-2 Collaboration						
Resp. Technique							
Status	Manufacturing						
Other Identifier							
Parent Equipment							
Parent Slot							
Location							
State	Good						MRC AC01
Safety							
RP Classification							
Comments							
Design							
Item in ABS	▶ DQW Cold Magnetic Shield Series (ver.0)						
Audit							
Created on	2018-11-11	by	DGOMEZTR				
Last modified on	2020-04-20	by	BEALMEID				
EDMS owner	DGOMEZTR	EDMS group	HL-LHC-WP4-MTF				

Main information of the asset may be found in this tab:

- Manufacturer of the equipment
- Current Status
- Current Location
- State
- RP Classification
- Access rights
- Etc.

Assembly Breakdown Structure

Assembly Breakdown Structure (ABS)

ABS allows to keep traceability of the components that are used to build the equipment (these components to have their MTF as well)

We just have to attach the 'child' (component) that have been previously set up within the system

Equipment Folder : Made Of

Equipment Identifier: HCMQYYP001-CR000001
Other Identifier: None
Description: Insertion Region Enlarged Aperture (90mm) Quadrupole - Prototype

Main Made of Equipment data Manufacturing Operation Documents History Map
 Actions: **Attach child** ABS Comparison: Show
 Order # | Type | Id/Missing Part Number | Other Id

Attach New Child to Equipment

1 Search child ... 2 Select child ... 3 Confirm data ... 4 Attach

Search child
 Input a search criteria for the desired child
 Identifier:
 Description:
 Type: Any

EDMS Home Favourites Inbox Caddie
 Navigator
 Manufacturing procedures
 Inspection & test procedures
 Qualifications
 Manufacturing records
 HCLMBXF001-KJ000001 - Cold Mass for Single Aperture (150mm) SC Separation Dipole (D1) 2m Model
 HCMBXFC004-KJ000001 - Splice box
 HCMBXFC005-KJ000001 - Wires
 HCMBXFC006-KJ000001 - Half shells

D1 - Separation Magnet						
Level	Eq. Code	Item Description		Category/Item	Own Class	Quantity
	MBXFM	Separation Dipole				1
	LMBXFM	Cold Mass		HCLMBXF0001		1
	MBXFC		End covers	HCMBXFC001		2
	MBXFC		Nozzles	HCMBXFC002		Batch
	MBXFC		Beam tube	HCMBXFC003		1
	MBXFC		Splice box	HCMBXFC004		Batch
	MBXFC		Wires	HCMBXFC005		Batch
	MBXFC		Half shells	HCMBXFC006		2
	MBXFC		End plates	HCMBXFC007		Batch
	MBXFC		Yoke-stacks	HCMBXFC008		Batch
	MBXFC		Keys	HCMBXFC009		Batch
	MBXFC		SS Collars	HCMBXFC010		Batch
	MBXFC		GFRP Lead Collars	HCMBXFC011		Batch
	MBXFC		Quench heaters	HCMBXFC012		Batch
	MBXFC		Ground Insulations	HCMBXFC013		Batch
	MBXFC		Brass protection	HCMBXFC014		Batch
	MBXFM	Magnet		HCMBXFM001		1
	MBXFC	Upper Coil		HCMBXFC015		1
	MBXFC		Cable	HCMBXFC016		Batch
	MBXFC		Wedges	HCMBXFC017		Batch
	MBXFC		End spacers	HCMBXFC018		Batch
	MBXFC		Layer Ramp Box	HCMBXFC019		Batch
	MBXFC		Lead Cover	HCMBXFC020		Batch
	MBXFC	Lower Coil		HCMBXFC021		1
	MBXFC		Cable	HCMBXFC022		Batch
	MBXFC		Wedges	HCMBXFC023		Batch
	MBXFC		End spacers	HCMBXFC024		Batch
	MBXFC		Layer Ramp Box	HCMBXFC025		Batch
	MBXFC		Lead Cover	HCMBXFC026		Batch

Main Made of Equipment data Manufacturing Operation Documents History Map
 Actions: **Attach child** | **Suffix child** | **Detach child** ABS Comparison: Show
 Order # | Type | Id/Missing Part Number | Other Id

40	Batch	HCMBXFC004-KJ000001	Splice box	1 Unit(s)
50	Batch	HCMBXFC005-KJ000001	Wires	1 Unit(s)
60	Equipment	HCMBXFC006-KJ000001	Half shells	
60	Equipment	HCMBXFC006-KJ000002	Half shells	
70	Equipment	HCMBXFC007-KJ000001	End plates	
70	Equipment	HCMBXFC007-KJ000002	End plates	
80	Batch	HCMBXFC008-KJ000001	Yoke-stacks	1 Unit(s)
90	Batch	HCMBXFC009-KJ000001	Keys	1 Unit(s)
150	Equipment	HCMBXFM001-KJ000001	Single Aperture (150mm) Separation Dipole (D1) 2m Model	MBXFS01 (a&b) D1

HCMBXFC024-KJ000001 - End spacers
 HCMBXFC025-KJ000001 - Layer Ramp Box
 HCMBXFC026-KJ000001 - Lead Cover

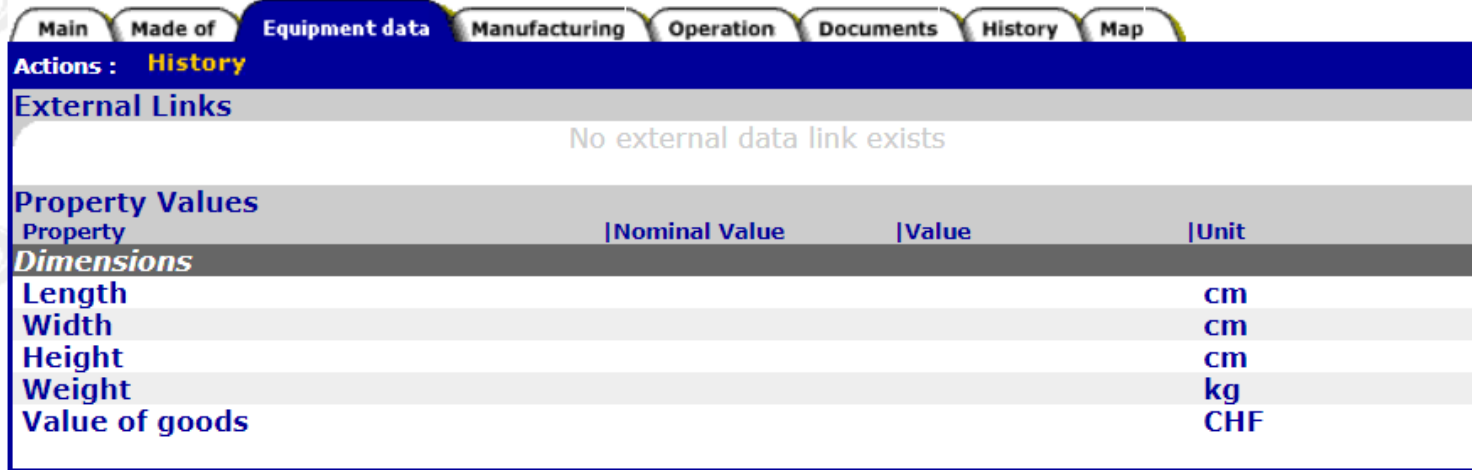


Main information of the equipment

Equipment Identifier: HCACFCM003-UK000001

Other Identifier: None

Description: DQW Cold Magnetic Shield Series



The screenshot shows a software interface with several tabs: Main, Made of, Equipment data (selected), Manufacturing, Operation, Documents, History, and Map. Below the tabs is a dark blue bar with the text "Actions : History". Underneath is a section titled "External Links" with the message "No external data link exists". The main part of the interface is a table titled "Property Values".

Property	Nominal Value	Value	Unit
Dimensions			
Length			cm
Width			cm
Height			cm
Weight			kg
Value of goods			CHF

This option will allow us to set the main parameters (nominal values) that will be checked during production (dimensions, mechanical properties, electrical values, magnetic checks, etc.). During the inspection the actual values shall be added (more for performance point of view).

Manufacturing Workflow

Equipment Identifier: HCACFCM003-UK000001
Other Identifier: None
Description: DQW Cold Magnetic Shield Series

Main Made of Equipment data Manufacturing Operation Documents History Map							
Actions : Add extra step							
Workflow Diagram							
No workflow diagram is defined for this equipment							
Workflow Steps							Last Repeated
Step ID	R/E	Other name	Description	Status	Result	NC	
5		()	Traceability of Materials	Pending			
10		()	Sheet Metal Working	Pending			
15		()	Visual Inspection	Pending			
20		()	Dimensional Control	Pending			
25		()	Cleaning-Degreasing	Pending			
30		()	Heat Treatment	Pending			
35		()	Visual Inspection	Pending			
40		()	Magnetic Measurements	Pending			
45		()	Shipping	Pending			
50		()	Reception at CERN	Pending			
55		()	Validation Test & Acceptance	Pending			

Before starting the production, productions steps (manufacturing and QC) to be settled (MIP):

- Implementation on MTF;
- Feed MTF folder of each asset during the production.

Approval of fabrication steps

Each step to be approved upon completion. We click in the Workflow Step number and then we EDIT to give the acceptance of the step and results **OK** (if the step would not have been accepted, then in results we select **Not OK**)

1

Actions: Back to list | **Edit** | Attach results doc | Attach non-conformity

Step ID	2.1	Other name	
Description	Electrical checks		
Status	Pending	Result	
Completed on			
Provided by		Expected by	
Responsible		Executed by	

Step Documents

- Applicable Standard
- Results
- Non Conformity

Audit

Created on	2015-10-12		
Last modified on	2016-10-11	by	HGACIAG

2

Actions: Save | Cancel

Step ID	2.1	Other name	
Description	Electrical checks		
Status	Pending	Result	
Completed on			
Provided by		Expected by	
Responsible		Executed by	

Step Comments

Step Documents

- Applicable Standard
- Results
- Non Conformity

3

Actions: Save | Cancel

Step ID	2.1	Other name	
Description	Electrical checks		
Status	Pending	Result	
Completed on			
Provided by		Expected by	
Responsible		Executed by	

Step Comments

Step Documents

- Applicable Standard
- Results
- Non Conformity

4

Actions: Save | Cancel

Step ID	2.1	Other name	
Description	Electrical checks		
Status	Pending	Result	
Completed on			
Provided by		Expected by	
Responsible		Executed by	Technician1

Step Comments

Step Documents

- Applicable Standard
- Results
- Non Conformity



Once we finish, do not forget to save!!!!

Outline

- EDMS and MTF;
- Item vs Asset;
- MIP and MTF;
- MTF: Assets, Assemblies, Steps;
- Manufacturing Documents;

Manufacturing Documentation

Reports and documents related to each step to be attached in the MTF folder of each asset. Documents can be previously uploaded on EDMS or can be attached directly in MTF (if so, EDMS document is created automatically).

Equipment Identifier: HCACFCM001-S9000001
Other Identifier: None
Description: DQW Cold Magnetic Shield (Variant #1)

Step ID	R/E	Other name	Description	Status	Result	Last Repeated	INC
1			Cutting	Pending			
1.1			Visual inspection	Pending			
2			Deburring	Pending			
2.2			Visual inspection	Pending			
2.3			Dimensional control	Pending			
3			Bending	Pending			
3.1			Visual inspection	Pending			
3.2			Cleaning-Degreasing	Pending			
4			Heat treatment	Pending			
5			Internal magnetic field	Pending			
6			Cleaning	Pending			
7			Shipping to CERN	Pending			

Step Generic Data	
Step ID	2.3
Description	Dimensional control
Status	Pending
Completed on	
Provided by	
Responsible	
Expected by	
Executed by	
Comments	
Step Documents	
Applicable Standard	
Results	
Non Conformity	
Audit	
Created on	2015-04-30
Last modified on	2016-04-29
	by HGARCIAG

The step is approved and the report with results is attached. If the step is not approved and a Non Conformity is opened, we can also attach it.

1 Select Document ... 2 Confirm data

Document to attach from EDMS or directly on the step (it will be then automatically created on EDMS).

Select the existing EDMS Document

Input the Document Number (in case you know it)
 or click on the first blue arrow to jump to the EDMS Search page
 or click on the second blue arrow to jump to EDMS create document wizard

EDMS Document Number

or

▶ Click to **search** for documents in EDMS

or

▶ Click to **create** a new document in EDMS

The document associated to this step of the asset is attached in MTF.

This process is to be repeated for each asset.

Other documents to be attached

Equipment Identifier: HCACFCM003-UK000001
Other Identifier: None
Description: DQW Cold Magnetic Shield Series

Main Made of Equipment data Manufacturing Operation Documents History Map

Actions : **Attach document** Display: **Extended**

LHC-ACFCM-FR-0003 v.0.9	Dimensional Control DQW CMS HCACFCM003-UK000001 and HCACFCM003-UK000002	In Work
Doc. page	31022_-_M4K0175_DIMENSIONAL_REPORT xlsx (260 Kb)	
	Dimensional_Report_Deviations_Analysis xlsx (16 kb)	

1 Document Type ... **2** Select Document ... **3** Confirm data

Select Document Type

Chose if the Document is a:
(ONLY these two cases should be attached here)

Additional Document

Additional Non-Conformity (not linked to any Step)

Cancel Continue >

Any other document can be attached to the MTF of the asset:

- Material certificates
- Manufacturing drawings
- MIP
- Welding maps
- Etc.

Outline

- EDMS and MTF;
- Item vs Asset;
- MIP and MTF;
- MTF: Assets, Assemblies, Steps;
- Manufacturing Documents;

Conclusions

- Manufacturing Records (Material Certificates, Quality Control Records, Test Records, Vérifications, etc.) are to be stored in MTF (integral part of EDMS)
- The tool is also granting the traceability of the assemblies (what goes where)
- Each asset represents the produced entities and they are individually traced



***Thanks
Questions?***

