

A detailed 3D wireframe model of a particle accelerator, showing a large circular ring structure and various internal components and support structures.

# **BINP and FAIR's product life cycle management**

Klaus Hoehne  
BINP Workshop May, 28 2020

- BINP is a key partner for the construction of FAIR
- For managing your contributions to FAIR it is necessary
  - to define your deliverables in detail
  - to document your work
  - to coordinate all logistics process of your deliverables
- FAIR's product lifecycle management (PLM) will support this
- PLM concept and system have been presented by Konstantin Istomin last workshop
- Today: Why?

# Functional Location w/ (Article) BoM

**Techn. Platz Strukturdarstellung: Strukturliste**

Ebene n. o. Aufr. gesamt Materialklassen Strukturvergleich

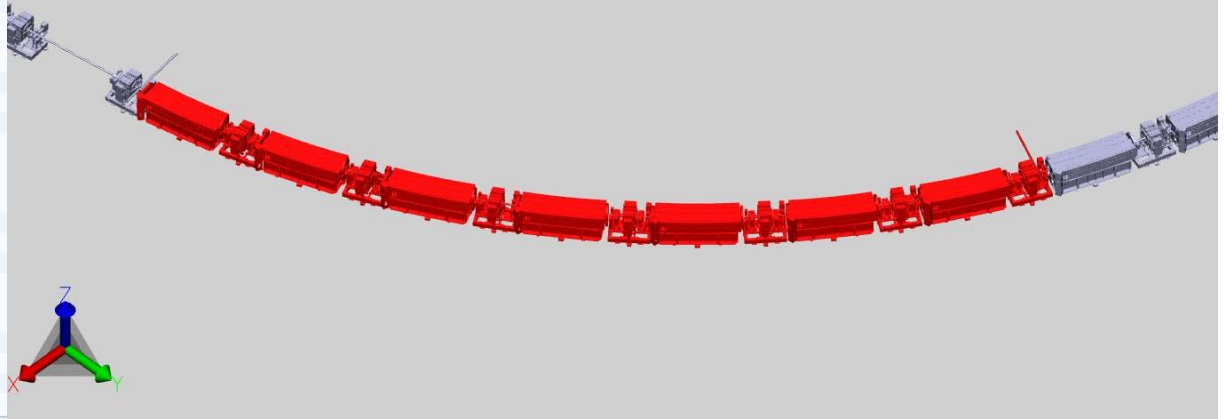
Technischer Platz F.HR.HR09 Gültig ab 15.10.2018

Bezeichnung HESR Section 09

Item	Description	Material Class	Quantity	Unit
F.HR.HR09	HESR Section 09			
F.HR.HR09.0010				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0020				
AID:0002095	Quadrupolmodul 4E		1	ST
AID:0002158	HR.Q1		1	ST
AID:0002157	HR.K1		1	ST
AID:0002157	HR.K1		1	ST
F.HR.HR09.0030				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0040				
AID:0002096	Quadrupolmodul 5		1	ST
AID:0002158	HR.Q1		1	ST
AID:0002157	HR.K1		1	ST
AID:0002157	HR.K1		1	ST
F.HR.HR09.0050				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0060				
AID:0002091	Quadrupolmodul 2E		1	ST
AID:0002158	HR.Q1		1	ST
AID:0002157	HR.K1		1	ST
F.HR.HR09.0070				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0080				
AID:0002097	Quadrupolmodul 7E		1	ST
AID:0002158	HR.Q1		1	ST
AID:0002157	HR.K1		1	ST
F.HR.HR09.0090				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0100				
AID:0002094	Quadrupolmodul 4		1	ST
AID:0002158	HR.Q1		1	ST
AID:0002157	HR.K1		1	ST
AID:0002157	HR.K1		1	ST
F.HR.HR09.0110				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0120				
AID:0002097	Quadrupolmodul 7E		1	ST
AID:0002158	HR.Q1		1	ST
AID:0002157	HR.K1		1	ST
F.HR.HR09.0130				
AID:0000355	HESR Dipole		1	ST
F.HR.HR09.0140				
AID:0002092	Quadrupolmodul 3		1	ST

## Functional locations w/ (Article) BoM define in detail

- your deliverables
- what is needed where
- enable installation planning





# Relevant Data of Articles/Components e.g. Attributes w.r.t. Logistics



The screenshot displays the SAP 'Equipment anzeigen : Klassifizierung' interface. It shows the object details for CID: 02000010034, including its class (PLM\_LOGISTICS) and various attributes. A table lists dates and values for FAT, test start/end, and delivery terms. Another table shows dimensions like weight, height, and length. A third table lists contact partners for campus, shipping, and sales.

Merkmalbezeichnung	Wert
FAT	13.10.2017
Test Start	
Test Ende	
Vormontage Start	
Vormontage Ende	
Einbautermin (geplant)	01.04.2021
Liefertan (geplant)	17.10.2017
Liefertan bestätigt	17.10.2017
Liefertan Baustelle	

Merkmalbezeichnung	Wert
Lieferort	STF
Lieferort Baustelle	T110
Einbauort (geplant)	1SXY, U30

Merkmalbezeichnung	Wert
Gewicht (brutto)	3.150,00 kg
Gewicht (netto)	3.150,00 kg
Höhe (brutto)	1.968,00 mm
Breite (brutto)	1.055,00 mm
Länge (brutto)	4.500,00 mm
Höhe (netto)	1.968,00 mm
Breite (netto)	1.055,00 mm
Länge (netto)	4.238,00 mm

Merkmalbezeichnung	Wert
Ansprechpartner Campus	C. ROUX, F. KAETHER
Ansprechpartner Spedit...	
Ansprechpartner Versen...	S. SATTler (BNG)

Logistics data for each CID are prerequisite for

- organization of **transport** to FAIR sites/Components are **classified** by classes, i.e. groups of attributes and **customs**
- provision of **storage** and **assembly space**
- all **transports on FAIR site**

All **attributes** and their **values** related to an article/component is **attached** to the articles/components **digital twin**, identified by **AID/CID**

Articles/components can be **found** by use of classes and/or attributes and their value

E.g. the class **PLM\_LOGISTICS** has all attributes defined by logistics team to handle logistics **To be provided asap**

[https://www.gsi.de/fileadmin/Project\\_Management\\_Office/PLM\\_Team/2.\\_Documents/YYMMDD-PLM-Logistics-Template.xlsx](https://www.gsi.de/fileadmin/Project_Management_Office/PLM_Team/2._Documents/YYMMDD-PLM-Logistics-Template.xlsx)

- Use of **SAP** standard classification system
- Information exchange (Excel) through **PLM** team

# Status Tracking

Progress is visualized by status of articles (AID) and components (CID)

**Material AID:0002050 anzeigen (FAIR PLM Material)**

Zusatzdaten OrgEbenen

Grunddaten 1 Grunddaten 2 Klassifizierung

Material AID:0002050 Vacuum chamber 069

A1 In Planning  
 A2 In Concept Engineering  
 A3 In Final Design  
 A4 In Design Validation  
 A5 In Production/Installat.  
 A6 Locked  
 A7 Inactive

Abmessungen/EAN

Bruttogewicht 0,000 Gewichtseinheit  
 Nettogewicht 0,000  
 Volumen 0,000 Volumeneinheit  
 Größe/Abmessung  
 EAN/UPC-Code EAN-Typ

Grunddatentexte

Gepflegte Sprachen: 0 Grunddatentext Sprache:

Materialberechtigungsgruppe

Berechtigungsgruppe

Of each article (AID) ...

... and each component (CID)

**Equipment anzeigen : Allgemeine Daten**

Klassenübersicht Meßpunkte/Zähler

Equipment CID:07000010312 Typ FAIR - Equ

Bezeichnung Vacuum chamber 069

Status EHEQ **INTG**

Gültig ab 04.12.2018 Gültig bis

Allgemein Standort Struktur Dokumente Ser.daten

Allgemeine Daten

Klasse PIM\_VAC\_CHA Vacuum chamber

Objektart

BerechtGruppe

Gewicht 0,000 Größe/Abmessung

InventarNr In Betrieb ab

Bezugsdaten

AnschaffWert 0,00 AnschaffDatum

Herstelldaten

Hersteller BINP Herstellerland RU

Typbezeichnung Baujahr/-monat / 00

HerstTeilNr

HerstSerialNr SERIAL

Status mit Ordnungsnummer

X	Stat	Text	Nr
<input type="radio"/>	INIT	Initial	1
<input type="radio"/>	PROD	Production [FAT]	10
<input type="radio"/>	SHIP	Shipment [SAT Aa]	20
<input type="radio"/>	FUNC	Functional Test [SAT Ab]	30
<input type="radio"/>	ADWN	Additional Work Needed	35
<input checked="" type="radio"/>	INTG	Integrated to an assembly	38
<input type="radio"/>	STOR	Storage	40
<input type="radio"/>	INST	Installation [SAT Ba]	50
<input type="radio"/>	COMM	Commissioning [SAT Bb]	60
<input type="radio"/>	OPER	In Operation	70
<input type="radio"/>	MNTN	In Maintenance	80

- Provision of
  - functional locations and articles defines your and (y)our partner's deliverables
  - documentation documents your work and is indispensable for the following phases of FAIR's lifecycle
  - logistics data enables support by GSI's logistics team for transport, assembly and storage
  - status data visualizes your progress
- The data are a prerequisite for permission to ship

First steps have been made by you - thank you!

Let's make the next steps

- We will support you
  - contact person: Konstantin Istomin
  - [konstantin.istomin@fair-center.eu](mailto:konstantin.istomin@fair-center.eu)
  
- Service email addresses
  - PLM: [plm-service@gsi.de](mailto:plm-service@gsi.de)
  - EDMS: [edms-service@gsi.de](mailto:edms-service@gsi.de)
  - Logistics: [logistik@gsi.de](mailto:logistik@gsi.de)



**Thank you for your attention!**

# BACKUP

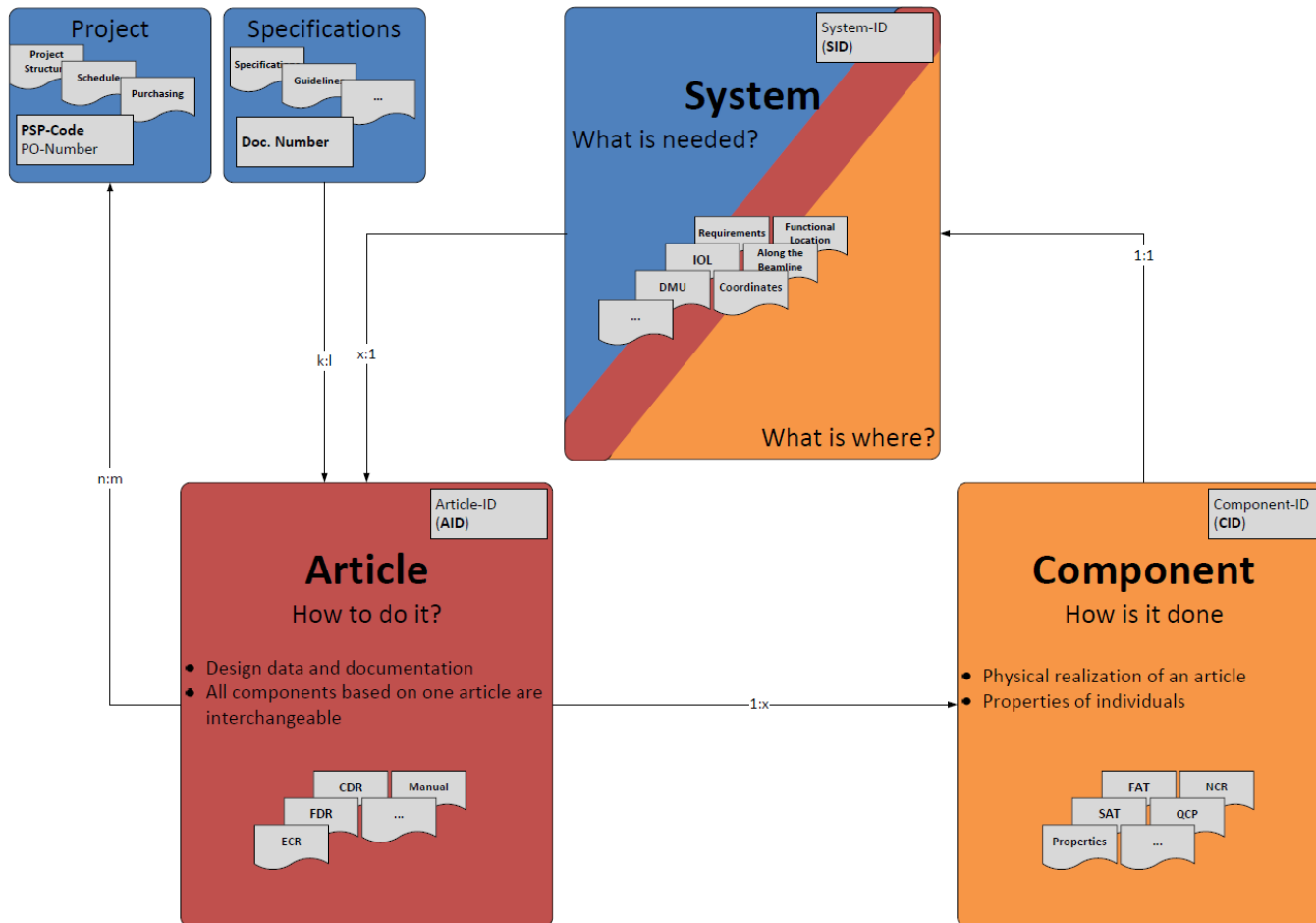
“Although the **introduction** of the CERN EDMS initially was marked by a certain **reluctance** and normal **resistance to change**, the **PLM** platform has **today** become an **integral part** of the Organization’s engineering activities.

Quality assurance methodology and advanced management tools for engineering have **proven their worth to** both project **managers and** project **engineers**.

A key factor in achieving this success was the very close collaboration between the EDMS Service team, the LHC project management and the main LHC equipment groups.”

D. Widegren, PLM at CERN – A True Challenge, CERN, 2008

# PLM Concept: Data Model & Life Cycle



# PLM Concept: Product Structure

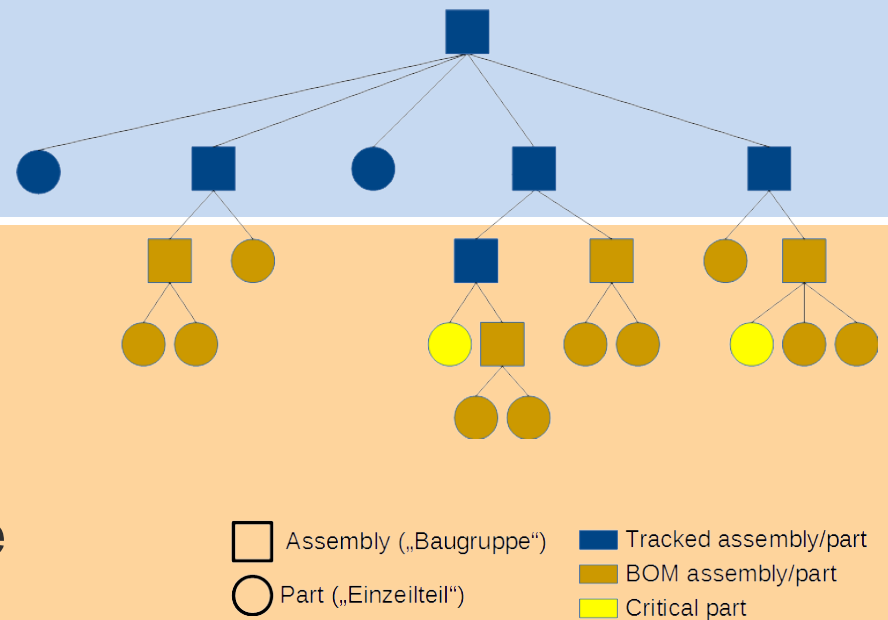
A **component** is an assembly or a part which has to be **tracked by PLM** due to technical, commercial, legal, safety, or operating reasons.

A component can be part of another component.

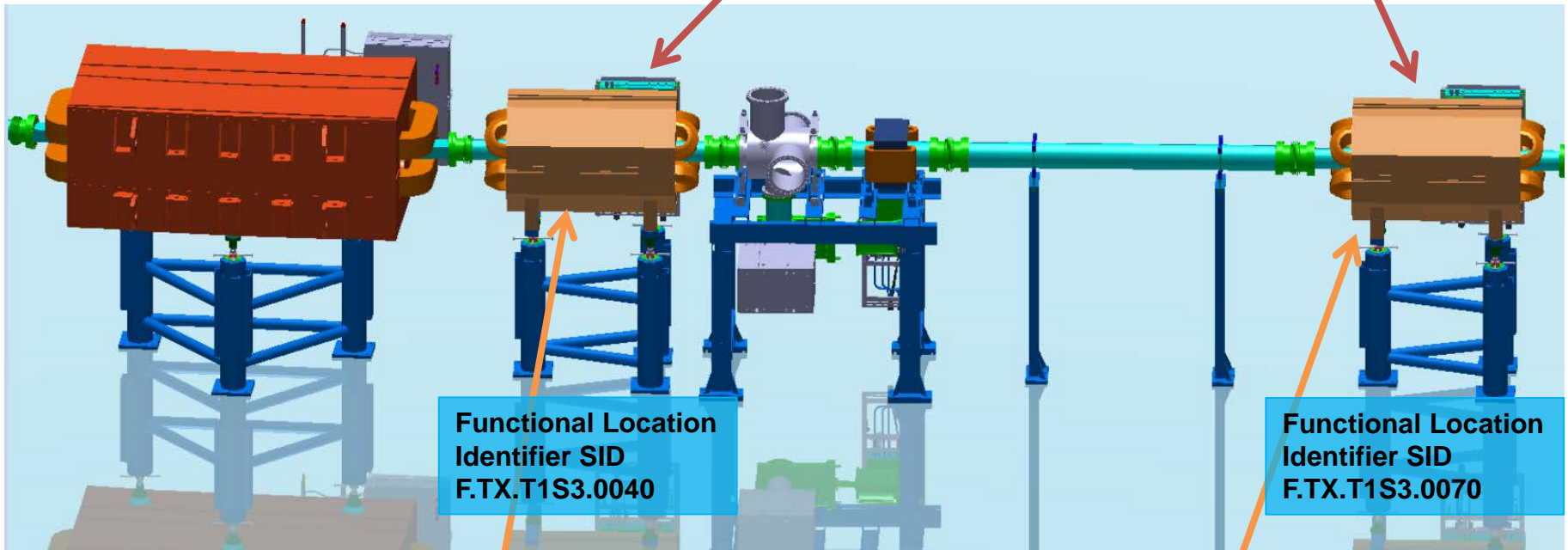
Virtual components, e.g. dipole strings are possible.

**Critical part** is a part of the component's **BOM\***, which needs **special attention**, e.g. replacement after a limited number of operating hours, high impact when cannot be replaced immediately.

\* BOM: bill of material



**Article Identifier AID (AID:0000073)**  
*Data/Documentation Quadrupole Type A parameters, specification, design data, BOM, risk analysis, CDR, FDR, engineering change request, ...*



**Functional Location Identifier SID (F.TX.T1S3.0040)**

**Functional Location Identifier SID (F.TX.T1S3.0070)**

**Individual Component Identifier CID (CID:18000009107)**  
*Data/Documentation 1. Quadrupole of Type A FAT, SAT A, SAT B, NCR, measurements, ...*

**Individual Component Identifier CID (CID:18000009162)**  
*Data/Documentation 2. Quadrupole of Type A FAT, SAT A, SAT B, NCR, measurements, ...*

## Interface to external partners

Input by provider



## Internal product lifecycle management system

FAIR PLM

