Technology Assembly

Team Tool Design, Team Layout Assembly

CAD-Documentation-Specification

(July 2010)

Basic Regulations

- In order to standardize planning for all the BMW plants, it is necessary to have up to date geometric documentation in the correct format for all production equipment. The following guidelines for CAD documentation describe the requirements for geometric design and documentation of production equipment in order to choose the best documentation method for the type of equipment. Layout and production equipment are generally documented differently, with production equipment being further separated into construction quality or DMU quality (Digital Mock-Up).

- The specific instructions and precise documentation are regulated by the following guidelines. These regulations are available in the BMW Partner Portal: https://b2b.bmw.com > public area > Departments > Technologies > Assembly ⁻ The CAD-Documentation-Specification specifies which systems are to be used and in which data format the information is to be delivered in. The details are further described in the table below, where the following abbreviations will be used:

Туре	System	Format	Delivery instruction		
L -> Layout quality	Microstation	.dgn	Delivery Instructions for CAD-Layout Planning		
K -> Construction quality	Catia V5 with CARISMA	.CATProduct, .CATPart, .CATDrawing, .xml	OEM-Guideline and Guideline for Design of production tooling		
D -> DMU quality	any system	.CATProduct, .CATPart, .xlsx, .pdf	DMU Delivery Instructions		
K (D)	Construction quality documentation is normally required. For some projects DMU quality documentation will be sufficient. This has to be agreed between the responsible BMW Tool Design Engineer, th BMW Project Manager and the contractor. The contractor is responsible for clarification of this point.				
(D)	DMU quality documentation is normally required. For some projects no 3D-documentation will be required. This has to be agreed between the responsible BMW Tool Design Engineer, the BMW Pre Manager and the contractor. The contractor is responsible for clarification of this point.				

The Layout Assembly Team is responsible for all issues regarding layouts.
The Tool Design Team is responsible for all issues regarding production equipment.
The contact people for each Fachteam are listed in the BMW Partner Portal.

Торіс	Layout Quality	Production equip. Quality	Examples	Comment		
Jigs, fixtures and tooling						
Standard fastening tools (pneumatic or battery) hand tools		D	All of the standardized tools in the tooling database (HSD) and other catalogues, e.g. nut	Only 3D geometries. Drawings or part lists are not required.		
Torque reaction arms and fixture devices		K (D)				
Custom made tools, fixtures and test		к		For test tools the most recent construction specification for master tools		
equipment		_		must also be applied.		
VIN engraving machine End effectors for assistors / robots	L	K	- Arm for glueing the windshields	-		
			Cockpit fitting Frontend and rearend fitting Sunroof and panorama roof fitting Gas tank fitting Seat installation Batterv installation			
Balancers / assistors	L	K (D)	Balance machine for fitting/installing: - Gas tank - Windschield glueing - Cockpit - Seat - Battery - Frontend and rearend - Sumoof and paparame roof	Documentation should include running rails but not existing support steelwork.		
Large fixtures and test equipment	L	к		Layout relevant if the required area is $>= 5m^2$.		
Robots	L			Layout with marked work areas.		
Conveyor equipment						
Assembly adapter (sill bar)		К				
Slings / Carriers	L	К (D)	Hangers for : - doors - motor - transmission - axles - gas tank - C-hangers - tilt hangers - Part sneediic hangers (eg. Cocknit)			
Sling trollies / Carrier trollies	L	D				
Skillets / Skids	L	D		-		
Plattens, load handling equipment, workpiece holder, etc.	L	к	MAT (Montage-Aggregate-Träger)			
Conveyors						
Overhead conveyor Floor conveyor	L	(D) (D)				
Poll belt or chain conveyors (e.g. dual		(D)				
strand conveyors)	-	(0)				
Stat conveyor, man nuers	-	(0)				
AGV	L	D				
Lifter, converter, etc.	L	D				
Miscellaneous equipment						
Facilities, automated cells, test rigs	L	K (D)	Machines for power train and marriage (lift table, tooling systems) Foaming machines Machines for the automatic conveyors and adapters Rolling test stand Axle alignment machine			
Storage racks, buffers, etc.	L	(D)				
Automatic racks	L	(D)				
Cranes	L	(D)				
Protective fences	L	(D)				
Team areas, line runner stations	L					
Structural steelwork, hangers, tool steel	L	(D)				
	-					
cabinets, etc.	-					
etc.	L	(U)				
Logistics Containers, special purpose containers (FFG)	L	K (D)	B to C containers			
Facilities, racks, live storage racks, heavy	L			-		
duty racks, etc.						
Building design (steel structure, concrete	L*			* Speedikon according to the supplier requirements from BMW		
structure)				Realestate and facility management. Geometry should be in dgn-tormat.		
Areas, assembly topology	FIS**			** BMW Area Information System is FIS (Flächen-Informations-System) based on the system Bentley Facilities Planner.		
Electric lighting	L			TriCAD HT		
Water supply, wastewater disposal	L			TriCAD HT		
Heating, ventilation	L			TriCAD HT		
Cable trays, network, electricity	L			TriCAD HT		

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