

IRIS 5 level product scopes - July 2015



Level 1	Level 2	Level 3	Level 4	Level 5
1	Car Body			
	1.1 Car body shell	1.1.1 Right side frame 1.1.2 Left side frame 1.1.3 Frame 1.1.4 Roof frame 1.1.5 Front end frame 1.1.6 Rear end frame 1.1.7 Intermediate ceiling 1.1.8 Structural partitions 1.1.9 Cab frame		
	1.2 Underframe	1.2.1 Front zone 1.2.2 Central zone 1.2.3 Rear zone		
	1.3 Floor	1.3.1 Floor plate 1.3.2 Floor cover 1.3.3 Floor heating		
	1.4 Crash structure	1.4.1 Energy absorber 1.4.2 Survival cell 1.4.3 Anti-climbing devices	1.4.1.1 Inter-trailer crash elements	
	1.5 Windows	1.5.1 Side windows - Passengers 1.5.2 Front wind-screen 1.5.3 Side windows - cab	1.5.2.1 Windscreen glass 1.5.2.2 Windscreen frame 1.5.2.3 Windscreen heating system 1.5.2.4 Wipers/washing system	
	1.6 Insulation			
	1.7 Painting and Sound damping			
	1.8 Fixing / connecting elements			
2	Car body fittings			
	2.1 Front/End car body fittings	2.1.1 Obstacle deflector 2.1.2 Hand rails 2.1.3 Front flap system 2.1.4 Gangway system	2.1.4.1 Bridge 2.1.4.2 Bellow	
	2.2 Roof car body fittings	2.1.5 Signal lamps and brackets		

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	2.3 Underframe car body fittings	2.3.1 Lifting points 2.3.2 Anti-roll		
	2.4 Lateral car body fittings			
3 Guidance (Bogies and running gear)				
	3.1 Motor bogie	3.1.1 Bogie linkage	3.1.1.1 Longitudinal force device	3.1.1.1.1 Traction rod watt's linkage 3.1.1.1.2 Central pivot included 3.1.1.1.3 Traction rope system
			3.1.1.2 Lifting devices 3.1.1.3 Lateral bump stop 3.1.1.4 Longitudinal bump stop 3.1.1.5 Vertical rotational rod 3.1.1.6 Yaw rotational stops 3.1.1.7 Friction pads 3.1.1.8 Bolster-beam	
		3.1.2 Bogie frame	3.1.2.1 Side frame 3.1.2.2 Transversal beam 3.1.2.3 Supports	
		3.1.3 Primary suspension	3.1.3.1 Vertical damper for primary suspension 3.1.3.2 Vertical stops 3.1.3.3 Axle guide system	3.1.3.3.1 Swing arm 3.1.3.3.2 Arm axle box 3.1.3.3.3 Pin guidance
			3.1.3.4 Vertical spring for primary suspension 3.1.3.5 Axle guide system steering device	
		3.1.4 Secondary suspension	3.1.4.1 Vertical Spring for secondary suspension 3.1.4.2 Pneumatic components for secondary suspension (set) 3.1.4.3 Vertical damper for secondary suspension 3.1.4.4 Lateral damper 3.1.4.5 Roll bar 3.1.4.6 Yaw damper 3.1.4.7 Active lateral suspension	
		3.1.5 3.1.5 Wheel set	3.1.5.1 Axle 3.1.5.2 Wheel 3.1.5.3 Torque transmission device connection	
		3.1.6 Auxiliary systems	3.1.6.1 De-icing device	

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	3.2 Trailer bogie (refer to level 3 and 4 of 3.1)	3.1.7 Safety add-ons	3.1.6.2 Load measurement device 3.1.6.3 Signal receptor 3.1.6.4 RPM measurement device 3.1.6.5 Pneumatic equipment on bogie 3.1.6.6 Earthing and bonding 3.1.6.7 Removing obstacle on the track device 3.1.6.8 Transversal axle accelerometer 3.1.7.1 Derail detection device 3.1.7.2 Wheel flat detection device 3.1.7.3 Hot axle box detection device 3.1.7.4 Non rotating axle detector 3.1.7.5 Mechanical Condition Monitoring Device 3.1.7.6 Clearance device	
4 Power System				
	4.1 Power supply	4.1.1 Current collectors 4.1.2 Earthing switch 4.1.3 High voltage Circuit 4.1.4 High voltage converter 4.1.5 Voltage transducer 4.1.6 Current transducer 4.1.7 Insulators 4.1.8 Isolators 4.1.9 Lightning arrestors 4.1.10 Lightning protection 4.1.11 Main fuses 4.1.12 Main circuit breaker 4.1.13 Main transformer 4.1.14 Roof disconnecter 4.1.15 Systems changeover switch	4.1.1.1 Roof pantograph 4.1.1.2 Third rail shoe	
	4.2 Power generation	4.2.1 Internal combustion machine	4.2.1.1 Starter 4.2.1.2 Turbo charger 4.2.1.3 Combustion air intake 4.2.1.4 Silencer	
	4.3 Power conversion	4.3.1 Brake chopper 4.3.2 Brake current circuit 4.3.3 Brake resistor 4.3.4 Direction switch 4.3.5 Electrical Filter 4.3.6 Line power converter	4.3.6.3 Rectifier for the synchron alternator 4.3.6.4 Inverter for asynchron alternator	

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	4.4 Power dissipation	4.3.7 Line power supply control unit 4.3.8 Voltage limiter 4.3.9 Switch gear 4.3.10 Voltage selector device 4.3.11 Alternator	4.3.8.1 Crow bar 4.3.11.1 Excitation	
	4.5 Power storage	4.4.1 Earthing facility 4.4.2 Return current bar 4.4.3 Return current transformer 4.4.4 Short circuit device 4.4.5 Exhaust gas facility 4.4.6 Exhaust gas after treatment 4.5.1 Flywheel 4.5.2 Fuel system 4.5.3 Fuel cell system 4.5.4 Super capacities		
5	Propulsion			
	5.1 Traction Control Unit (TCU) 5.2 Gear box	5.2.1 Transmission torque device 5.2.2 Gear box condition monitoring devices		
	5.3 Traction motor 5.4 Mechanical transmission	5.4.1 Hydraulic unit 5.4.2 Mechanical transmission chain	5.4.2.1 Propeller shaft	
	5.5 Power converter			
6	Auxiliary Systems			
	6.1 Air supply system	6.1.1 Main air system	6.1.1.1 Monitoring and control unit 6.1.1.1 Compressor 6.1.1.2 Air dryer 6.1.1.3 Reservoir	
	6.2 Hydraulic system	6.1.2 Auxiliary air system 6.2.1 Oil pump 6.2.2 Oil reservoir 6.2.3 Oil cooling system		
	6.3 Auxiliary electric system	6.3.1 Auxiliaries distribution circuit 6.3.2 Battery distribution circuit 6.3.3 Power supply circuit		
	6.4 Main auxiliary converter equipment	6.4.1 Auxiliary circuit 6.4.2 Auxiliary converter		

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	6.5 Low voltage power supply / Battery charger equipment 6.6 Special auxiliary converter equipment 6.7 Battery equipment 6.8 External supply system 6.9 Cooling unit for power and drive systems 6.10 Fire protection system 6.11 Sanding equipment 6.12 Horn 6.13 Flange lubrication device	6.4.3 Auxiliary intermediate circuit 6.6.1 Emergency converter 6.6.2 Low power converter for auxiliary functions 6.9.1 Brake resistor ventilator 6.9.2 Cooling water system 6.9.3 Gearbox cooling 6.9.4 Heat exchanger 6.9.5 Oil cooling unit 6.9.6 Roof cooling unit 6.9.7 Traction motor ventilator 6.9.8 Control circuits 6.10.1 Fire detection system 6.10.2 Fire extinguish system 6.11.1 Sand box 6.11.2 Sand ejector 6.11.3 Sand pipe heater		
7	Braking System			
	7.1 Brake control system 7.2 Friction brake equipment 7.3 Wheel Slip Protection (WSP) equipment	7.1.1 Drivers desk actuators 7.1.2 Electronic Brake Control Unit (BCU) 7.1.3 Pneumatic brake control 7.1.4 Indicators 7.1.5 Cocks 7.2.1 Disc brake 7.2.2 Parking brake 7.2.3 Block tread brake 7.2.4 Wheel tread equipment 7.3.1 Electronic control unit 7.3.2 Pole wheels	7.1.1.1 Brake handle 7.1.1.2 Emergency brake button 7.1.3.1 Pneumatic panel 7.1.3.2 Pneumatic brake control unit 7.2.1.1 Disc 7.2.1.2 Calliper 7.2.1.3 Pad	

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	7.4 Magnetic track brake equipment	7.4.1 Magnetic brake control & monitoring system 7.4.2 Bogie mounted mechanics	7.4.2.1 Spreader frame 7.4.2.2 Actuating cylinders 7.4.2.3 Centring device 7.4.2.4 Brake force transmission device	
	7.5 Emergency brake equipment 7.6 Eddy current brake equipment			
8 Interiors				
	8.1 Interior architecture	8.1.1 Compartment 8.1.2 Disabled provision		
	8.2 Interior equipment	8.2.1 Passenger seat	8.2.1.1 Folding Table 8.2.1.2 Video equipment 8.2.1.3 Audio equipment 8.2.1.4 Newspaper net 8.2.1.6 Footrest 8.2.1.8 Handhold	
		8.2.2 Folding seat 8.2.3 Manual curtain 8.2.4 Cloths hanger 8.2.5 Table 8.2.6 Luggage rack 8.2.7 Litter bin 8.2.8 Emergency brake call device 8.2.9 Fire detector 8.2.10 Fire fighting equipment	8.2.10.1 Fire extinguisher 8.2.10.2 Emergency exit hammer	
		8.2.11 Interior trim 8.2.12 Ash trays 8.2.13 Carpets and floor covering 8.2.14 Signage 8.2.15 Partitions 8.2.16 Bike racks 8.2.17 Ski racks 8.2.18 power outlet 8.2.19 Conference compartment special equipment	8.2.19.1 Whiteboard	
		8.2.20 Mother/Child compartment special equipment 8.2.21 Train crew compartment special equipment	8.2.21.1 Stretcher	
		8.2.22 Driver`s cab special equipment	8.2.22.1 Drivers desk module	

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				8.2.22.1.1 Desk 8.2.22.1.2 Sun shield 8.2.22.1.3 Sub-cab boards 8.2.22.1.4 Holder - Mobile Phone 8.2.22.1.5 Foot rest 8.2.22.1.6 Foot pushbuttons 8.2.22.1.9 Heating elements
	8.3 Toilet system	8.3.1 Toilet system control device 8.3.2 Emergency call device 8.3.3 Toilet bowl unit	8.2.22.2 Driver seat 8.2.22.3 Tool box 8.2.22.4 First Aid box 8.2.22.5 Emergency exit ladder 8.2.22.6 Comfort elements	
		8.3.4 Washbowl unit	8.3.3.1 Vacuum pump 8.3.3.2 Surge tank 8.3.3.3 Inlet/Outlet valve 8.3.3.4 Top cover 8.3.3.5 Paper dispenser	
		8.3.5 Fresh, grey or waste water system	8.3.4.1 Soap dispenser 8.3.4.2 Hand dryer 8.3.4.3 Water tap 8.3.4.4 Drain	
		8.3.6 Toilet door	8.3.5.1 Fresh, grey or waste water tank with isolation 8.3.5.2 Fresh, grey or waste water tank heater	
		8.3.7 Diaper changing table 8.3.8 Ventilation	8.3.8.1 Toilet occupied status indicator 8.3.8.2 Motors	
	8.4 Engine room 8.5 Catering system	8.5.1 Self contained catering module 8.5.2 Catering compartments		
		8.5.3 Cooking equipment	8.5.2.1 Preparation 8.5.2.2 Servery 8.5.2.3 Full Kitchen	
		8.5.4 Cold storage equipment	8.5.3.1 Microwave 8.5.3.2 Fan oven 8.5.3.3 Hob 8.5.3.4 Bain marie 8.5.3.5 Coffe machine	
			8.5.4.1 Chillers 8.5.4.2 Freezers	

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		8.5.5 Water system 8.5.6 Ventilation system 8.5.7 Serving equipment 8.5.8 Waste system 8.5.9 Payment system	8.5.4.3 Refrigerator 8.5.5.1 Boiler 8.5.5.2 Sink boil 8.5.5.3 Wash basin 8.5.5.4 Dishwasher 8.5.7.1 Dispensing head 8.5.7.2 Bain marie 8.5.7.3 Cupboard 8.5.7.4 Show case 8.5.7.5 Storage trolleys 8.5.7.6 Sales trolleys 8.5.9.1 Cash tills 8.5.9.2 Portable payment devices 8.5.9.3 Ticket machine 8.5.9.4 Money exchange 8.5.9.5 Vending machine	
9	On board vehicle control			
	9.1 Electronic Train Control System (ETCS) 9.2 Train Control Management System (TCMS) 9.3 Heritage Automatic Train Protection (ATP) unit 9.4 Automatic Train Operation (ATO) unit 9.5 Fault data logger 9.6 Heritage juridical recorder unit 9.7 Voice recorder 9.8 System, capture unit 9.9 Video surveillance 9.10 Electronic rear mirror	9.1.1 European Vital Computer (EVC) 9.1.2 Specific Transmission Module (STM) 9.1.3 Juridical Recorder Unit (JRU) 9.1.4 Radio 9.1.5 Train Interface Unit (TIU) 9.2.1 Driver Display Units (DDU) 9.2.2 Main Processor Unit (MPU) 9.2.3 Remote Input/Output Module (RIOM) 9.2.4 Monitoring Unit 9.2.5 Heritage vehicle and train network 9.9.1 Cameras 9.9.2 Digital Display Unit (DDU)		

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10 Passenger Information Systems (PIS)				
	10.1 Public Address System	10.1.1 Public Address (PA) unit 10.1.2 Microphone 10.1.3 Loudspeaker 10.1.4 Passenger call unit		
	10.2 Safety Alarm Systems	10.2.1 Emergency call equipment/Interphone 10.2.2 Emergency brake equipment 10.2.3 Video surveillance system(CCTV)	10.2.2.1 Coach device 10.2.2.2 Cab function 10.2.3.1 Video camera 10.2.3.2 Camera controller 10.2.3.3 Onboard console 10.2.3.4 Offboard video analysis system 10.2.3.5 Recording system / transmitting system	
	10.3 Central Passenger information System (PIS) unit			
	10.4 Driver-Machine Interface (DMI) for train/travel information	10.4.1 Interactive panel 10.4.1 Display		
	10.5 Seat reservation			
	10.6 Billing System			
	10.7 Trackside equipment			
11 Communication Systems				
	11.1 Train to wayside communication system	11.1.1 Railway open gateway (Rogate) 11.1.2 Heritage radio system 11.1.3 GPS 11.1.4 WAN connection 11.1.5 Satellite connection 11.1.6 GSM-R 11.1.7 WLAN	11.1.3.1 Antenna 11.1.4.1 GSM device 11.1.4.2 UMTS device 11.1.4.3 GPRS device	
	11.2 Onboard communication system	11.2.1 Communication servers 11.2.2 Wired communication infrastructure	11.2.2.1 Network Interface Cards (NIC) 11.2.2.2 Repeaters/Hubs 11.2.2.3 Bridges/Switches	

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			11.2.2.4 Routers 11.2.2.5 Gateways	
12 Cabling and Cabinets				
	12.1 Cabling	12.1.1 HV Cables 12.1.2 Medium Voltage Cable Harness 12.1.3 Low Voltage Cables Harness 12.1.4 System Cable Harness 12.1.5 HF Cables 12.1.6 LAN Cables 12.1.7 Multimedia Cables 12.1.8 Cable markers		
	12.2 Cabinets	12.2.1 Distribution boxes 12.2.2 Switch and relay boxes		
13 Door System				
	13.1 External doors	13.1.1 Passenger doors	13.1.1.1 Drive mechanism 13.1.1.2 Door Control Unit (DCU) 13.1.1.3 Passenger detection device 13.1.1.4 Obstacle detector 13.1.1.5 Door leaves	
		13.1.2 Entrance for disabled	13.1.2.1 Ramps 13.1.2.2 Lifts	
	13.2 Internal doors	13.1.3 Loading doors 13.1.4 Cab doors 13.1.5 Entrance steps		
		13.2.1 Gangway doors 13.2.2 Compartment doors 13.2.3 Cab rear wall doors		
14 Heating, Ventilating and Air Conditioning (HVAC)				
	14.1 Heating, Ventilating and Air Conditioning (HVAC) control unit			
	14.2 Air conditioning system	14.2.1 Refrigerant based cooling system	14.2.1.1 Condenser 14.2.1.2 Evaporator	
		14.2.2 Gas based cooling system	14.2.2.1 Compressor 14.2.2.2 Turbine 14.2.2.3 Cooling system heat exchanger	
	14.3 Heating system	14.3.1 Oil burner		

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	14.4 Air ventilation and distribution System 14.5 Air intake 14.6 Exhaust air unit 14.7 Pressure protection system	14.3.2 Waste heat exchanger 14.3.3 Electrical heating 14.4.1 Mixing box 14.4.2 Air ventilation ducts 14.4.3 Air ventilation outlets 14.5.1 Fan		
15	Tilt System			
	15.1 Tilt Control Unit 15.2 Actuating System 15.3 Pantograph tilt system 15.4 Tilt monitoring and detection			
16	Lighting			
	16.1 Emergency lighting system 16.2 Exterior lighting system 16.3 Interior lighting system	16.1.1 Lighting circuit 16.1.2 Lighting power supply unit 16.1.3 Lighting lamp module 16.2.1 Lighting control unit 16.2.2 Light		
17	Coupler			
	17.1 Front coupler 17.2 Intermediate coupler 17.3 Emergency coupler (Towing coupler)	17.1.1 Mechanical coupler 17.1.2 Pneumatic coupler 17.1.3 Electric coupler 17.1.4 Radio Coupler 17.1.5 Inductive coupler	17.1.1.1 Mechanical coupler head 17.1.1.2 Mechanical coupler rod 17.1.1.3 Mechanical coupler locking unit 17.1.1.4 Mechanical coupler coupler release 17.1.1.5 Mechanical coupler buffer element 17.1.1.6 Mechanical coupler energy absorption element 17.1.1.7 Mechanical coupler telescoping and retraction unit	
18	Rolling Stock			
	18.1 18.1 Light Rail Vehicles			

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	18.2 Regional and Commuter Trains 18.3 Metros 18.4 Coaches and Passenger Cars 18.5 High Speed Trains 18.6 Locomotives 18.7 Freight Wagons 18.8 Transportation Systems	18.1.1 Trams 18.1.2 Light rail Transit systems 18.3.1 Conventional metro 18.3.2 Metro systems 18.5.1 Intercity 18.5.2 Intercity systems 18.8.1 Monorail systems 18.8.2 Automated People Movers (APM) systems		
19	Infrastructure			
	19.1 Signalling 19.2 Safety systems 19.3 Energy 19.4 Track	19.1.1 Components for control command and signalling for wayside 19.2.1 Level crossing mechanisms 19.2.2 Platform screen doors 19.2.3 Safety detection devices 19.3.1 Overhead contact line 19.3.2 Transformers 19.3.3 Distributors 19.3.4 Third Rail 19.3.5 Ground level power supply 19.3.6 Braking energy recovery 19.4.1 Rail 19.4.2 Fastening system 19.4.3 Track sleepers 19.4.4 Switch systems 19.4.5 Other Devices	19.3.1.1 Contact wires 19.3.1.2 Insulators 19.3.1.3 Feeders 19.3.1.4 Jumpers	
20	Single railway components			
	20.1 Bearings 20.2 Connectors 20.3 Fastener 20.4 Filters 20.5 Hoses 20.6 Printed circuit boards (PCBs) 20.7 Piping			

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	20.8 Plugs 20.9 Power modules 20.10 Rubber 20.11 Sealing 20.12 Sensors			

