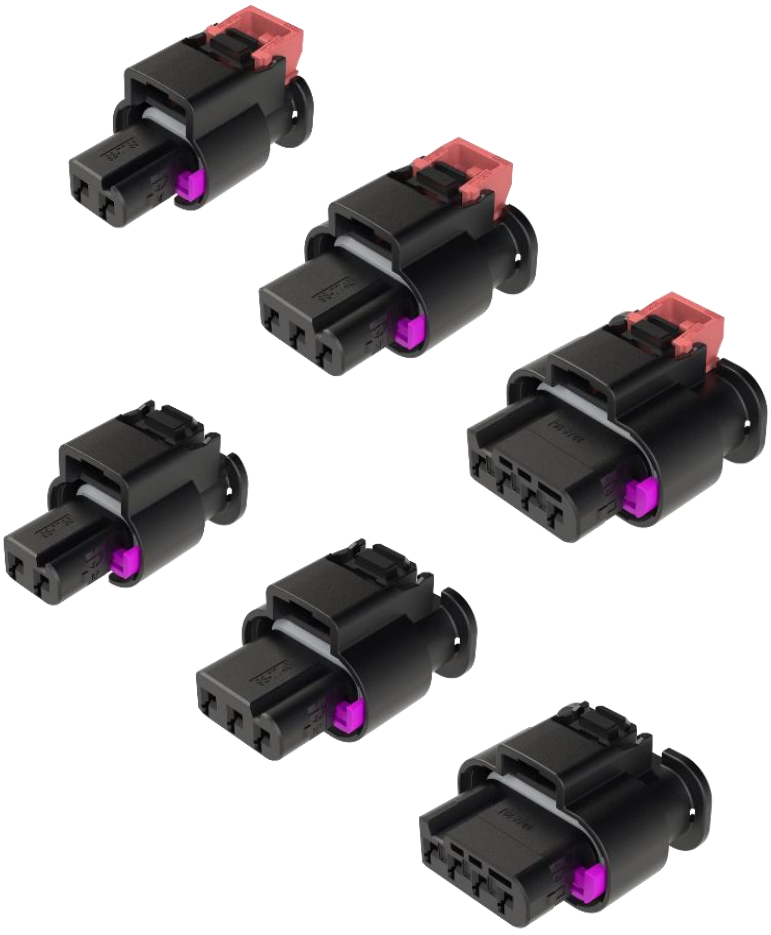
Product Standard for

YAZAKI 1.2 WP CB (F) Connectors Family 2P, 3P & 4P



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1. Scope

1.1 Content

This Product Standard covers the performance, tests and quality requirements for the **YAZAKI 1.2 WP CB (F) Connectors Family 2P, 3P & 4P**.

1.2 Qualification

To perform tests use following specified standards and specifications. All inspections shall be performed using the applicable inspection plan and product drawing.

If there are any differences between this document and product drawings, the content of product drawing takes priority. In all other cases this document shall take priority.

2. Referenced Documents

2.1 YAZAKI Documents

a) Yazaki Customer Drawing: 7298-7912-30:R (2P), 7298-7917-30:R (3P), 7298-7924-30:R (4P)
b) Handling Manual: YPES-15-2066

2.2 Other Documents

a) USCAR Specifications: SAE/USCAR-2 REVISION 8

3. Part Numbers and Applicable Terminals

3.1 Female Connector Parts and Part Numbers

a) Outer Housing – YAZAKI Part Numbers:
   - 7198-7920-30 (2P)
   - 7198-7921-30 (3P)
   - 7198-7922-30 (4P)

b) Inner Housing – YAZAKI Part Numbers:
   - 7198-7736-30, etc. (2P)
   - 7198-7740-30, etc. (3P)
   - 7198-7744-30, etc. (4P)

c) Spacer – YAZAKI Part Numbers
   - 7172-1966-20 (2P)
   - 7172-1967-20 (3P)
   - 7172-1968-20 (4P)

d) CPA – YAZAKI Part Number
   - 7172-1965-50

e) Interface seal – YAZAKI Part Numbers

- 7137-3428 (2P)
- 7137-3429 (3P)
- 7137-3430 (4P)

3.2 Applicable Terminals

Female Terminals:
a) According drawing C-1534326,

YAZAKI Part Number	Supplier Part Number	Wire size	Plating
Vibration class V2			
7216-3961-02	1418844-1	0.35mm^2	Tin
7216-6545-02	1670146-1	0.5 - 0.75mm^2	Tin
7216-3760-02	1418850-1	1mm^2	Tin
Vibration class V3			
7216-3961-06	1418844-3	0.35mm^2	Silver
7216-6545-06	1670146-3	0.5 - 0.75mm^2	Silver
7216-3760-06	1418850-3	1mm^2	Silver

valid only for sealed version with **min. 0.35 mm^2 and max. 1 mm^2**.

4. Features of Performance

4.1 Design

Shape and physical dimensions of the Product are defined on the applicable Product Drawings.

4.2 Material

All materials are defined in the applicable Product Drawings and in Table 1.

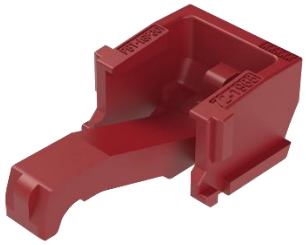
4.2.1 Table 1: Views and Descriptions of Parts and Materials

1.2 WP CB (F) Connectors Family 2P, 3P & 4P			
VIEW	**NAME**	**MATERIAL COLOR**	**YAZAKI PART NUMBER**
	2P Outer Housing	PBT-IGF15 BLACK	7198-7920-30
	3P Outer Housing	PBT-IGF15 BLACK	7198-7921-30
	4P Outer Housing	PBT-IGF15 BLACK	7198-7922-30
	2P Inner Housing Code A	PBT-IGF30 BLACK	7198-7736-30

	2P Inner Housing Code B	PBT-IGF30 LIGHT GRAY	7198-7737-40
	2P Inner Housing Code B (Additional)	PBT-IGF30 NATURAL	7198-7737
	2P Inner Housing Code C	PBT-IGF30 DARK GRAY	7198-7735-10
	2P Inner Housing Code C (Additional)	PBT-IGF30 BLUE	7198-7735-90
	3P Inner Housing Code A	PBT-IGF30 BLACK	7198-7740-30
	3P Inner Housing Code B	PBT-IGF30 LIGHT GRAY	7198-7741-40

	3P Inner Housing Code B (Additional)	PBT-IGF30 NATURAL	7198-7741
	3P Inner Housing Code C	PBT-IGF30 DARK GRAY	7198-7739-10
	3P Inner Housing Code C (Additional)	PBT-IGF30 BLUE	7198-7739-90
	3P Inner Housing Code D	PBT-IGF30 BROWN	7198-7742-80
	3P Inner Housing Code D	PBT-IGF30 VIOLET	7198-7742-20
	4P Inner Housing Code A	PBT-IGF30 BLACK	7198-7744-30

	4P Inner Housing Code B	PBT-IGF30 LIGHT GRAY	7198-7745-40
	4P Inner Housing Code B (Additional)	PBT-IGF30 NATURAL	7198-7745
	4P Inner Housing Code C	PBT-IGF30 DARK GRAY	7198-7743-10
	4P Inner Housing Code C (Additional)	PBT-IGF30 BLUE	7198-7743-90
	4P Inner Housing Code D	PBT-IGF30 BROWN	7198-7746-80
	4P Inner Housing Code D (Additional)	PBT-IGF30 VIOLET	7198-7746-20

	2P Spacer	PBT-IGF30 PURPLE	7172-1966-20
	3P Spacer	PBT-IGF30 PURPLE	7172-1967-20
	4P Spacer	PBT-IGF30 PURPLE	7172-1968-20
	CPA	PBT-IGF30 RED	7172-1965-50
	2P INTERFACE SEAL	VMQ NATURAL	7137-3248
	3P INTERFACE SEAL	VMQ NATURAL	7137-3429

	4P INTERFACE SEAL	VMQ NATURAL	7137-3430

4.3 Quality and Performance

4.3.1 Table 2: General and Increased Performances

Test Seq. Terminal – Connector Insertion/Retention force, ID D		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.1 Terminal-to-Connector Insertion/Retention Force	1. Wire 0.35mm^2: Terminal insertion force ≤ 15N Wire 1mm^2: Terminal insertion force ≤ 36N 2. Forward stop push-through force ≥ 50N 3. Terminal retention force – Primary lock ≥ 40N 4. Terminal retention force – Primary + secondary lock after moisture conditioning ≥ 70N	
5.1.8 Visual Inspection	Destructive test method.	

Test Seq. Miscellaneous Component Engage/Disengage Force, ID E		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.4.5 Miscellaneous Component Engage/Disengage Force	TPA: 1. Preset to lock (with terminals): ≤ 60N 2. Preset to lock (without terminals): ≥ 15N 3. Lock to preset (with terminals) (1st mate): ≤ 60N 4. Lock to preset (without terminals) (2nd mate): for 2P ≥ 7N for 3P ≥ 13N for 4P ≥ 18N 5. Removal from housing not possible due to plastic deformation.	
	CPA: 1.Preset to set – unmated connector ≥ 60N 2. Preset to set – mated connector 5N ≤ F ≤ 25N 3. Set to preset 10N ≤ F ≤ 30N 4. Complete removal from connector (preset to out) ≥ 30N	
5.1.8 Visual Inspection	Destructive test method.	

Test Seq. Connector-Connector Mating/Unmating Force, ID G		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.2 Connector-Connector Mating/Unmating Force	1. Mating force ≤ 75N Max mating force: 2P ≤ 40N 3P ≤ 40N 4P ≤ 50N (Max force given for information.) 2. Retention force with locking engaged ≥ 110N 3. Unmating force with locking released ≤ 75N 4. Lock deflection without CPA 6N ≤ F ≤ 51N 5. Lock deflection with CPA (with applied force 70N) - Latch does not move above the locking feature.	
5.1.8 Visual Inspection	Destructive test method.	

Test Seq. Polarization Effectiveness, ID H		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.4 Polarization Feature Effectiveness	Applied force: 150N 1. The incorrect orientation 2. The correct orientation/wrong index No damage to the connector and no electrical contact between the male/female terminals after force is applied.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Connector Drop Test, ID I		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.8 Drop Test	Components not displaced from their intended shipping position.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Cavity Damage Susceptibility, ID J		
Test description	Performance data	Procedure
5.1.8. Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.9. Cavity Damage Susceptibility	1. Secondary Lock: Upon reaching 35N the secondary lock breaks.	
5.1.8. Visual Inspection	Destructive test method.	

Test Seq. Terminal/Cavity Polarization, ID AE		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.10 Terminal/Cavity Polarization	1.2 system Sn Insertion Force: 15N Terminals inserted in incorrect orientation do not fit or lock into a connector cavity beyond the insulation wings or cable seal. No visible damage to either the terminal or connector that would prevent subsequent correct insertion and function following any attempt at incorrect insertion.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Vibration/Mechanical Shock, ID M		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.1.7 Connector and Terminal Cycling	Cycling step.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ 1.2 system Sn: R ≤ 15mΩ	
5.4.6 Vibration/Mechanical Shock	Cycling step.	
5.1.9 Circuit Continuity Monitoring	No loss of electrical continuity for more than 1 µs.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ 1.2 system Sn: R ≤ 15mΩ	
5.3.2 Voltage Drop	≤ 50mV for Ag R ≤ 10mΩ ≤ 50mV for Sn R ≤ 15mΩ	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Thermal Shock, ID N		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.1.7 Connector and Terminal Cycling	Cycling step.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ	
5.6.1 Thermal Shock	Cycling step.	
5.1.9 Circuit Continuity Monitoring	No loss of electrical continuity for more than 1 µs.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ	
5.3.2 Voltage Drop	≤ 50mV for Ag R ≤ 10mΩ	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Temperature/Humidity Cycling, ID O		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.1.7 Connector and Terminal Cycling	Cycling step.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ	
5.6.2 Temperature/Humidity Cycling	Cycling step.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ	
5.3.2 Voltage Drop	≤ 50mV for Ag R ≤ 10mΩ	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	
5.4.1 Terminal-Connector Retention Force	Primary + Secondary Lock: F ≥ 50N	

Test Seq. High Temperature Exposure, ID P		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.1.7 Connector and Terminal Cycling	Cycling step.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ	
5.6.3 High Temperature Exposure	Cycling step.	
5.3.1 Dry Circuit Resistance	1.2 system Ag: R ≤ 10mΩ	
5.3.2 Voltage Drop	≤ 50mV for Ag R ≤ 10mΩ	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	
5.4.1 Terminal-Connector Retention Force	Primary + Secondary Lock: F ≥ 50N	

Test Seq. Fluid Resistance, ID Q		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.6.4 Fluid Resistance	Samples immersed for 30 minutes in gasoline, diesel fuel, engine oil, ethanol, power steering fluid, automatic transmission fluid, engine coolant, brake fluid, diesel exhaust fluid.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Temp / Humidity-PV Leak, Submersion, High Pressure Spray, ID RSAA		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.1.7 Connector and Terminal Cycling	Cycling step.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.6 Pressure/Vacuum Leak	0.5bar/15s - No air bubbles visible.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.2 Temperature/Humidity Cycling	Cycling step.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.6 Pressure/Vacuum Leak	0.3bar/15s - No air bubbles visible.	
5.6.5 Submersion	Conditioning only.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.7 High Pressure Spray	Conditioning only.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	
5.4.1 Terminal-Connector Retention Force	Primary + Secondary Lock: F ≥ 50N	

Test Seq. High Temperature Exposure, PV Leak, Submersion, High Pressure Spray, ID TUAB		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5.
5.1.7 Connector and Terminal Cycling	Cycling step.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.6 Pressure/Vacuum Leak	0.5bar/15s - No air bubbles visible.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.3 High Temperature Exposure	Cycling step.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.6 Pressure/Vacuum Leak	0.3bar/15 sec. – No air bubbles visible.	
5.6.5 Submersion	Conditioning only.	
5.5.1 Insulation Resistance	R > 100MΩ at 500VDC	
5.6.7 High Pressure Spray	Conditioning only.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	
5.4.1 Terminal-Connector retention force	Primary + Secondary Lock: F ≥ 50N	

Test Seq. Connector seal retention – unmated connector, ID Y		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.13 Connector Seal Retention – Unmated Connector	Connector withstands a = 1960 m/s^2 for more than 10 seconds.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

Test Seq. Connector seal retention – mated connector, ID Z		
Test description	Performance data	Procedure
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	SAE/USCAR-2 REVISION 8 SEC 5.9.5
5.4.14 Connector Seal Retention – Mated Connector	Seal remains on the connector and in its intended position.	
5.1.8 Visual Inspection	No deterioration, cracks, deformities, etc. that could affect their functionality noticed.	

4.3.2 Table 3: Qualification and requalification test sequence

Working Committee Test Guideline		Test Group								
		Term. – Conn. Insertion/Retention	Misc. Component Engage/Disegage	Conn. Conn Mating/Unmating	Polarization Effectiveness	Drop	Cavity Damage	Terminal/Cavity Polarization	Con. Seal Retention - Unmated	Con. Seal Retention - Mate
		D	E	G	H	I	J	AE	Y	Z
Test										
Visual Inspection	5.1.8	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3
Terminal – Connector Insertion/retention force	5.4.1	2								
Mating/Unmating Force (Non-mech. Assist)	5.4.2			2						
Polarization Feature Effectiveness	5.4.4				2					
Miscellaneous Component	5.4.5		2							
Connector-to-Connector Audible Click	5.4.7									
Connector Drop Test	5.4.8					2				
Cavity Damage	5.4.9						2			
Terminal/Cavity Polarization	5.4.10							2		
Connector Seal Retention - Unmated	5.4.13								2	

Connector Seal Retention – Mated Connector	5.4.14									2

Working Committee Test Guideline		Test Group			
		Vibration/Mechanical Shock	Thermal Shock	Temperature/Humidity Cycling	High Tempetaure Exposure
		M	N	O	P
Test		Test Sequence			
Visual Inspection	5.1.8	1, 8	1, 8	1,8	1, 7
Connector and/or Terminal Cycling	5.1.7	2	2	2	2
Circuit Continuity Monitoring	5.1.9	5	5		
Dry Circuit Resistance	5.3.1	3, 6	3, 6	3, 5	3, 5
Voltage Drop	5.3.2	7	7	6	6
Terminal-Connector Retention Force	5.4.1			9	8
Vibration/Mechanical Shock	5.4.6	4			
Insulation Resistance	5.5.1			7	
Thermal Shock	5.6.1		4		

Temperature/Humidty Cycling	5.6.2			4	
High Temperature Cycling	5.6.3				4

Working Committee Test Guideline		Test Group		
		Fluid Resistance	Temp/Humidity- PV Leak, Submersion, High Press. Spray	High Temp Exposure- PV Leak, Sub-mersion, High Press. Spray
		Q	RSAA	TUAB
Test		Test Sequence		
Visual Inspection	5.1.8	1, 3	1, 12	1, 12
Connector and/or Terminal Cycling	5.1.7		2	2
Terminal-Connector retention force	5.4.1		13	13
Insulation Resistance	5.5.1		3, 5, 7, 10	3, 5, 7, 10
Temperature/Humidity Cycling	5.6.2		6	
High Temperature Exposure	5.6.3			6
Fluid Resistance	5.6.4	2		
Submersion	5.6.5		9	9

Pressure/Vacuum Leak	5.6.6		4, 8	4, 8
High Pressure Spray	5.6.7		11	11

5. Quality Assurance Provisions

5.1 Qualification Testing

5.1.1 Sample Selection

The samples selected in random order from current production.

5.1.2 Test Sequence

Qualification inspection verified by testing samples as specified in section 5.3.2 Table 3.

5.2 Requalification Testing

If significant changes are made on the product or manufacturing process, which significantly affects form, fit or function re-qualification testing has to be made. It will consist of whole or part of original testing sequence as determined by responsible engineering.

5.3 Acceptance

Acceptance is based on verification that the product meets requirements of section 5.3.
Failures attributed to the equipment, test setup or operator deficiencies will not disqualify the product.

The indications from Handling Manual should be considered

5.4 Quality Conformance Inspection

The applicable YAZAKI Quality Inspection Plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements will be in accordance with the applicable drawing and this specification.

6. Revisions

Revision	Description	Name	Date
N	New (ID: 8911)	N.Jagodic	20.06.2024.