

Sliver 2.0 Cable Assemblies

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) Sliver 2.0 Cable Assemblies to determine their conformance to the requirements of Product Specification 108-130025.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of Sliver 2.0 Cable Assemblies. Testing was performed at TE Shanghai Testing Laboratory between 3Jun 2019 and 6Dec 2023. The test files number for these testing are TP-19-01071, TP-19-01289, TP-19-02072, TP-19-02919, TP-20-00155, TP-20-01861, TP-20-01888, TP-21-01114 and TP-23-03699, These documentations are on file at and available from the Engineering Assurance Product Testing Laboratory.

1.3. Conclusion

The Sliver 2.0 Cable Assemblies listed in paragraph 1.5, conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-130025.

1.4. Product Description

TE Connectivity (TE) Sliver 2.0 Cable Assemblies are designed to meet requirements for applications such as servers, storage and switches equipment.

1.5. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Table 1 - Test Specimens

Test Group	Quantity	Part Number	Description
1	5	2340876-1	C/A, 1C, STR-STR, Profiled Latch with Button, 30awg
	5	2340861-1	C/A, 2C, STR-STR, Profiled Latch with Button, 30awg
	5	2340882-1	C/A, 4C, STR-STR, Profiled Latch with Button, 30awg
	5	2360727-1	C/A, 2C, STR-STR, Formed Latch with Pull tab, 30awg
	5	2351375-1	PIGTAIL, 1C, LATERAL, Formed Latch with Pull tab, 30awg
	5	2354866-1	C/A, 0.5C, STR, Profiled Latch with Button, 30awg
	5	2361331-1	C/A, 1C, STR-STR, Formed Latch with Pull tab, 30awg
	5	2361342-1	C/A, 2C, STR-STR, Profiled Latch with Pull tab, 30awg
	5	2361353-1	C/A, 4C, STR-STR, Profiled Latch with Pull tab, 30awg
	5	2375584-3	C/A, 4C+, STR-STR, Profiled Latch with Pull tab, 30awg
	5	2411914-1	C/A, 0.5C, STR, Profiled Latch with Button, 30awg
2	55	NA	Cirris test fixture, Sliver 0.5C/1C/2C/4C/4C+
	5	2340876-1	C/A, 1C, STR-STR, Profiled Latch with Button, 30awg
	5	2340861-1	C/A, 2C, STR-STR, Profiled Latch with Button, 30awg
	5	2340882-1	C/A, 4C, STR-STR, Profiled Latch with Button, 30awg
	5	2375584-3	C/A, 4C+, STR-STR, Profiled Latch with Pull tab, 30awg
	5	2411914-1	C/A, 0.5C, STR, Profiled Latch with Button, 30awg
3	25	NA	Cirris test fixture, Sliver 0.5C/1C/2C/4C/4C+
	5	2340876-1	C/A, 1C, STR-STR, Profiled Latch with Button, 30awg
	5	2375584-3	C/A, 4C+, STR-STR, Profiled Latch with Pull tab, 30awg
	5	2411914-1	C/A, 0.5C, STR, Profiled Latch with Button, 30awg
3	20	NA	Cirris test fixture, Sliver 0.5C/1C/4C+

	6	NA	SI test fixture, Sliver 0.5C/1C/4C+
--	---	----	-------------------------------------

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35°C
- Relative Humidity: 25 to 75% RH

1.7. Qualification Test Sequence

Specimens identified in Table 1 were subjected to the test sequences listed in Table 2.

Table 2 - Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)		
	1	2	3
	TEST SEQUENCE (b)		
Initial examination of product	1	1	1
Pre-Conditioning	2	2	2,6
High Speed Test			3,8
Latch Retention Axial	5		7
Lateral/Longitudinal Force	6		
Mechanical Shock		4	
Vibration		3	
Mating force insertion	3		
Unmating force	7		
Durability	4		
Thermal Cycling Test			5
Damp Heat Steady State			4
Final examination of product	8	5	9

NOT (a) See paragraph 4.1.A.
 (b) Numbers indicate sequence in which tests are performed.

2. SUMMARY OF TESTING

2.1. Initial Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. They were inspected and accepted by the Quality Assurance Department.

2.2. Pre-Conditioning – All Test Groups

No physical damage detrimental to product performance was visible due to durability.

2.3. High speed test - Test Groups 3

All test specimens pass Differential Insertion Loss, Differential Return Loss.

2.4. Latch retention – Test Group 1 and 3

Specimens met retention force requirement.
 Sliver 2.0 Profiled Latch retention force 50N min.
 Sliver 2.0 Formed Latch retention force 30N min.

2.5. Lateral/Longitudinal Force – Test Group 1

Specimens met retention force requirement. No discontinuities occur during test.
 Sliver 2.0 Profiled Latch retention force 25N min.
 Sliver 2.0 Formed Latch retention force 15N min.

2.6. Mechanical shock – Test Group 2

No physical damage and no electrical discontinuity greater than 1 µs were found during and after test.

2.7. Vibration – Test Group 2

No physical damage and no electrical discontinuity greater than 1 µs were found during and after test.

2.8. Mating force – Test Group 1

Specimens met the mating force requirement.
 Sliver 2.0 0.5C mating force 25.4N max.
 Sliver 2.0 1C mating force 40.8N max.
 Sliver 2.0 2C mating force 56.2N max.
 Sliver 2.0 4C mating force 87N max.
 Sliver 2.0 4C+ mating force 102.4N max.

Specimens	Mating force (Unit: Newton)										
	2340876-1	2340861-1	2340882-1	2360727-1	2351375-1	2354866-1	2361331-1	2361342-1	2361353-1	2375584-4	2411914-1
1	15.39	34.33	47.58	35.50	13.34	15.35	8.64	45.19	71.66	62	8.9
2	16.53	39.00	44.70	36.60	17.72	15.06	9.41	43.13	49.81	62.5	12.6
3	16.22	32.05	41.35	29.30	16.79	16.22	10.52	36.91	75.94	63.6	14.5
4	18.11	33.94	48.96	37.00	18.85	12.99	13.58	50.47	46.25	66.3	16.8
5	19.41	33.99	46.25	35.80	14.08	11.05	18.52	44.13	55.03	61.7	18.9
Avg.	17.13	34.66	45.77	34.80	16.16	14.13	11.82	43.96	59.74	63.2	14.34
Max.	19.41	39.00	48.96	37.00	18.85	16.22	18.52	50.47	75.94	66.3	18.9
Min.	15.39	32.05	41.35	29.30	13.34	11.05	8.64	36.91	46.25	61.7	8.9

Table 3 – Mating Force Results (Unit: Newton)

2.9. Unmating force – Test Group 1

Specimens met the unmating force requirement.
 Sliver 2.0 0.5C unmating force 2.5N min.
 Sliver 2.0 1C unmating force 5N min.
 Sliver 2.0 2C unmating force 7.5N min.
 Sliver 2.0 4C unmating force 12.5N min.
 Sliver 2.0 4C+ unmating force 15N min.

Specimens	Unmating force (Unit: Newton)										
	2340876-1	2340861-1	2340882-1	2360727-1	2351375-1	2354866-1	2361331-1	2361342-1	2361353-1	2375584-4	2411914-1
1	13.82	18.32	26.26	18.31	13.33	5.58	11.47	17.25	20.54	27.64	4.91
2	15.84	17.64	29.2	15.68	15.58	5.29	13.84	15.29	22.54	28.91	4.73
3	15.48	20.29	32.21	16.21	13.23	4.80	18.79	15.48	17.44	25.97	5.90
4	14.6	17.21	27.85	16.38	17.05	5.29	15.31	16.37	17.93	25.77	5.73
5	14.92	16.82	40.38	17.91	17.25	5.12	11.96	18.51	17.64	30.12	5.46
Avg.	14.93	18.06	31.18	16.90	15.29	5.22	14.28	16.58	19.22	27.69	5.35
Max.	15.84	20.29	40.38	18.31	17.25	5.58	18.79	18.51	22.54	30.12	4.91
Min.	13.82	16.82	26.26	15.68	13.23	4.8	11.47	15.29	17.44	25.77	5.90

Table 4 – Unmating Force Results (Unit: Newton)

2.10. Durability - Test Group 1

No physical damage detrimental to product performance was visible due to durability.

2.11. Temperature Cycling Test - Test Group 3

No physical damage detrimental to product performance was visible due to temperature cycling test.

2.12. Damp Heat Steady State – Group 3

No physical damage detrimental to product performance was visible due to damp heat steady state.

2.13. Final Examination of Product - All Test Groups

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

3. TEST METHODS

3.1. Initial Examination of Product

A Certificate of Conformance was issued stating that all specimens in this test package were produced, inspected, and accepted as conforming to product drawing requirements, and were manufactured using the same core manufacturing processes and technologies as production parts.

3.2. Pre-Conditioning

EIA-364-9. Manual mate and un-mate specimens for 5 cycles with latches engaged. See Figure 1 for a representative image of the test setup.

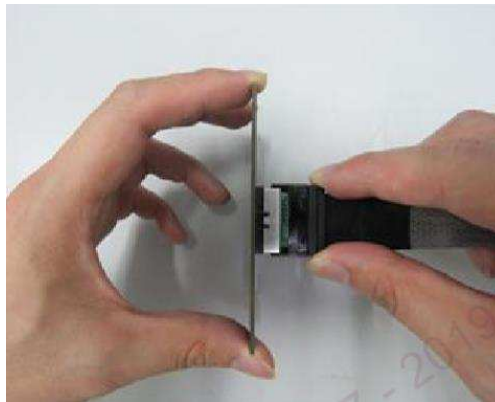


Figure 1 – Pre-Conditioning Test Setup

3.3. High speed test

- Differential Insertion Loss Limit line @16Ghz = (-19dB)
- Differential Return Loss limit line @16Ghz = (-10dB)

3.4. Latch retention

Apply 50N to cable plug with profiled latch and hold for 1 minute. Apply 30N to cable plug with formed latch and hold for 1 minute. See Figure 2 for a representative image of the test setup.

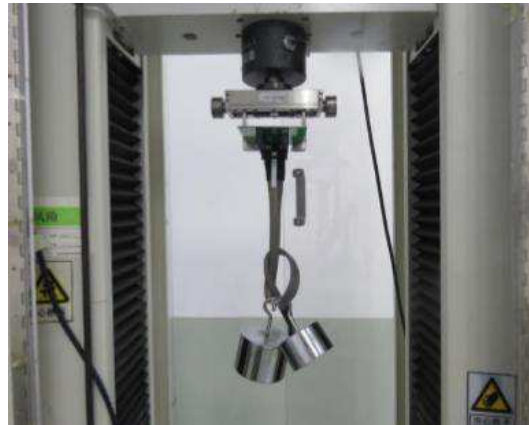


Figure 2 – Latch retention Test Setup

3.5. Lateral/Longitudinal Force

25N force for profiled latch and 15N force for formed latch applied perpendicular to mating interface. 360degree in 45degree increments, beginning perpendicular to long end of connector body. Force applied to the cable, no more than 100mm length of cable to be used. See Figure 3 for a representative image of the test setup.

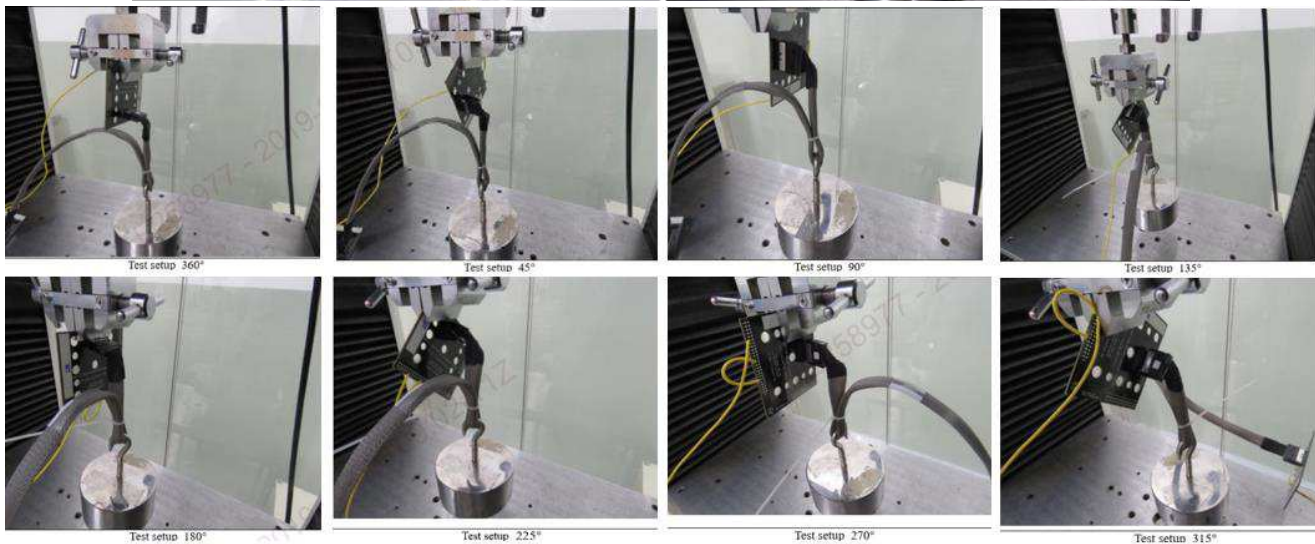
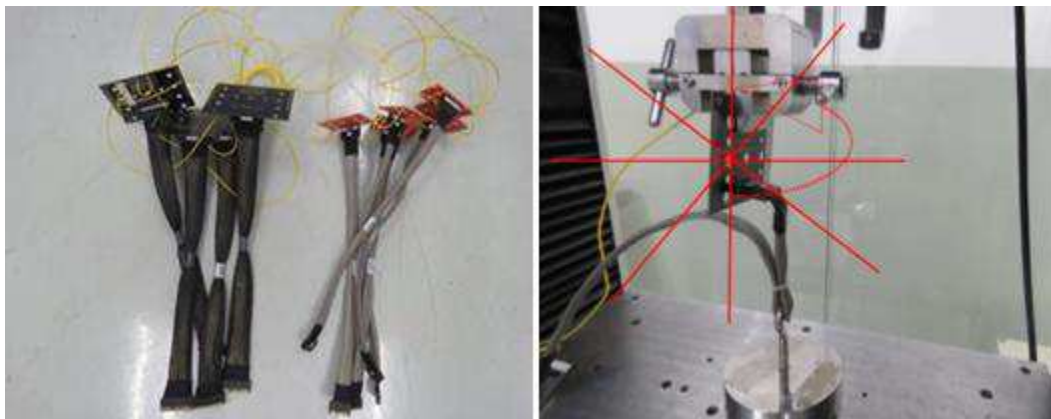


Figure 3 – Lateral/Longitudinal Force Test Setup

3.6. Mechanical shock

EIA364-27, Test Condition A , Subject mated specimens to 30G's half sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4 for a representative image of the test setup.

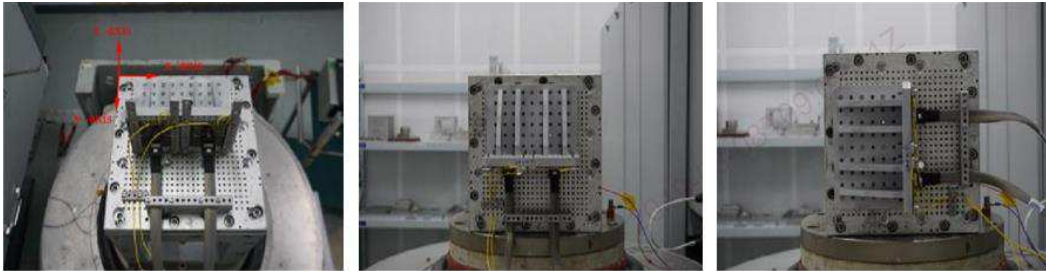


Figure 4 – Mechanical shock Test Setup

3.7. Vibration

EIA-364-28 Test Condition IIV, Test Condition, Letter D. Subject mated specimens to 3.1G RMS between 20-500 Hz. 15 minutes in each of 3 mutually perpendicular planes. See Figure 5 for a representative image of the test setup.

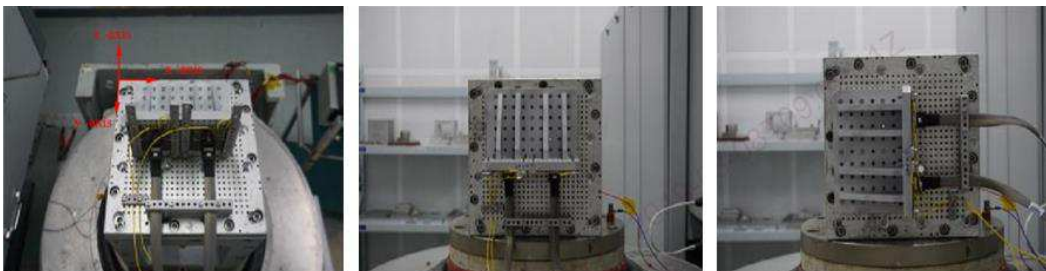


Figure 5 – Mechanical shock Test Setup

3.8. Mating force

EIA-364-13. Measure force necessary to mate specimens with latches engaged at a maximum rate of 25.4 mm per minute. See Figure 6 for a representative image of the test setup.



Figure 6 – Mating Force Test Setup

3.9. Unmating force

EIA-364-13. Measure force necessary to disengage the plug from the connector at a maximum rate of 25.4 mm per minute. See Figure 7 for a representative image of the test setup.

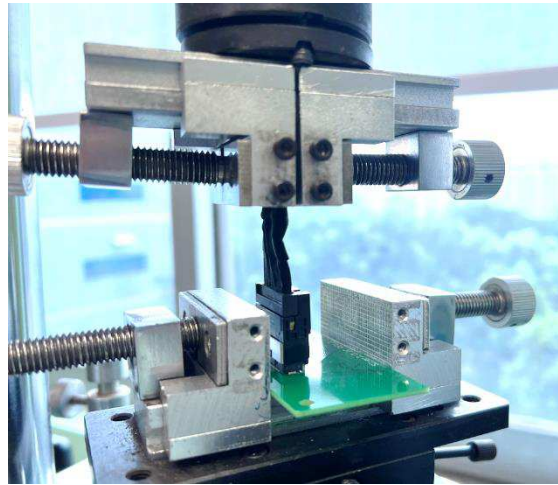


Figure7 – Unmating Force Test Setup

3.9. Durability

EIA-364-9. Manual mate and un-mate specimens for 25 cycles with latches engaged. See Figure 8 for a representative image of the test setup.

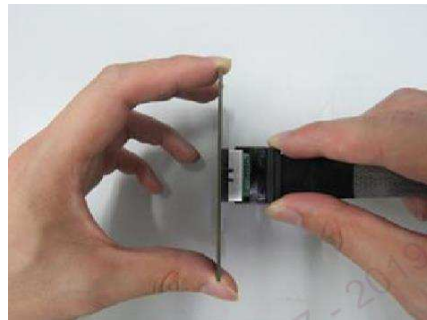


Figure 8 – Durability Test Setup

3.10. Temperature Cycling Test

Specimens were subjected to thermal shock testing in accordance with test procedure EIA 364-32G, Test Condition VIII. Mated specimens were subjected to 10 cycles between -40°C and 75°C with a minimum dwell of 10 minutes at extremes and a 4°-6° ramp rate. See Figure 9 for a representative image of the test setup.

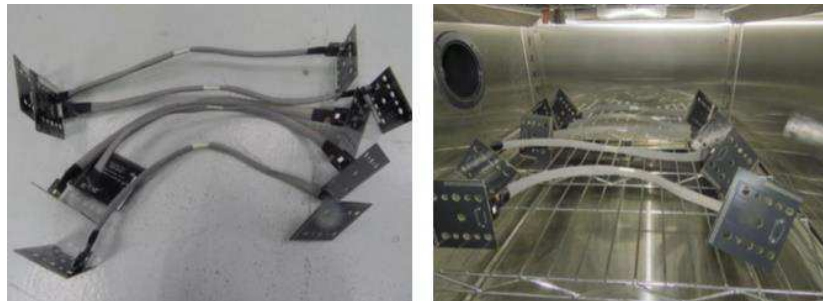


Figure 9 – Temperature Cycling Test Setup

3.12 Damp Heat Steady State

80°C/85%RH for 500hours. See Figure 10 for a representative image of the test setup.



Figure 10 – Damp Heat Steady State Test Setup

3.13. Final Examination of Product

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.