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Report:	Test report
Title:	Flexible cables and their connection
Customer:	Ather India

Document approval		
	Name	**Signature**
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1. Issues (situation, motivation and tasks)

The Ather Company has designed and developed a charging connector for electric vehicles, which is patented. Ather has approached Bosch (BGSW) to validate the charging connector between the vehicle and the charging station according to IS 17017 selective tests as prescribed by Ather requirements.

Samples of vehicle connector used for test. The task was to perform pull test on samples, followed by a torque test to evalauate tensile strength of the cable with assembly. Test and acceptance criteria are as per **IS 17017** chapter no. 25.3 to check the functionality of the samples.

2. Results, short version

		o.k.	not o.k.
2.1	**Visual inspection of plastic parts for cracks and breakage (New condition)**	☒	☐
2.2	**Cable elongation/anchorage after the test**	☒	☐
2.3	**No break in electrical connection (Continuity check) after test**	☒	☐

The overall result of the examined samples is:

☒ **Positive**
☐ **Negative: No further analysis required**

Recommendation for further work: NA

3. Conclusions and consequences

All connector samples have passed the test. All the test parameters are within the specified limit of assessment criteria.

4. Results, long version

- Plastic parts and terminals inspected before test for abnormalities like cracks, burrs, rust and breakage. All the samples subjected to test were in good/acceptable condition → **OK**

Cable elongation/anchorage after the test – OK (See chapter 5.4 for criteria)

Sl No.	Displacement
Sample - 1	OK
Sample - 2	OK
Sample - 3	OK

No break in electrical connection (Continuity check) after test – OK (See chapter 5.4 for criteria)

Sl No.	Continuity Check
Sample - 1	OK
Sample - 2	OK
Sample - 3	OK

5. Details

5.1 Part details:

Sl. No.	Description	Part number	Manufacture date / Received date	Remarks
1	Vehicle connector	340A0021042	July-2022	-

5.2 Equipment details:

Sl. No.	Test equipment	Equipment no.	Remarks
1	UTM Machine	ATS-021	Location: External lab (NABL - **TC-7419**)

5.3 Sample preparation, test setup and test details:

1. Visual inspection of plastic parts conducted on all the samples before test.
2. 3 samples of vehicle connector assembly are used for the test.
3. The sample is fixed in the test apparatus so that the axis of the cable is vertical where it enters the sample
4. The cable is then subjected 100 times to a pull of the value shown in Table 18. Each pull is applied without jerks and has a duration of 1s.
5. Immediately afterwards, the cable is subjected to a torque, of the value specified in Table 18.
6. The displacement of the mark on the cable in relation to the the cable anchorage is measured.
7. Continuity check is performed after the test.
8. Same procedure was followed for the all the other samples.
9. See pictures in chapter 6 Enclosure.

5.4 Test conditions and assessment criteria:

Table 18 Pull Force and Torque Test Values for Cable Anchorage

(Clause 25.3)

Rated current	Pulling Force	Torque	Maximum Displacement
A	N	N·m	mm
13 to 20	160	0.6	2
30 to 32	200	0.7	2
60 to 70	240	1.2	2
125	240	1.5	2
200	250	2.3	2
250	500	11.0	5
400	500	11.0	5

Asessemnt Criteria:

- During the tests, the cable shall not be damaged.
- After the tests, the cable shall not have been displaced by more than the values indicated in Table 18. (The displacement of the mark on the cable in relation to the the cable anchorage is measured)
- For non-rewirable accessories, there shall be no break in the electrical connections.

6. Enclosure

6.1 Pictures

Pic 1: Test set up	Pic 2: Test set up