ZTT (Chinese) ACSS Mallard Conductor

Dead-end connector and splice-connector systems were tensile tested for the ZTT ACSS conductor to ensure that the ultimate tensile strength measured for each system met or exceeded 95% of the rated breaking strength of the conductor (32,585 lbs).

Dead-end and splice compression connector assemblies were utilized for these tests. The compression connectors were all manufactured by AFL and were sized appropriately for their respective conductors (see Table 6-7).

Table 6-7. ZTT connector specifications

Conductor Manufacturer	ZTT	
Conductor Geometry	ACSS/MA2 Mallard	
Nominal Outer Diameter	1.139 in (28.59 mm)	
Construction	Thirty (30), 4.14 mm 1350-O Temper aluminum wires (2 layers) over nineteen (19) 2.48 mm round steel wires	
Rated Breaking Strength	34,300 lb.	
Dead-end Part No.	Aluminum Body	8130.122 HT
	Steel Eye	9416.516
Splice Part No.	Aluminum Body	8030.122 HT
	Steel Sleeve	4016.516

The samples were individually loaded into the test frame and pre-loaded to 2% of the RBS of the ZTT ACSS conductor (686 lbs or 3.05 kN). A loading rate of 5,145 lbs/min was used for the ZTT ACSS connector-conductor tests.

The tension applied to the systems over the test time is plotted in Figure 6-4.

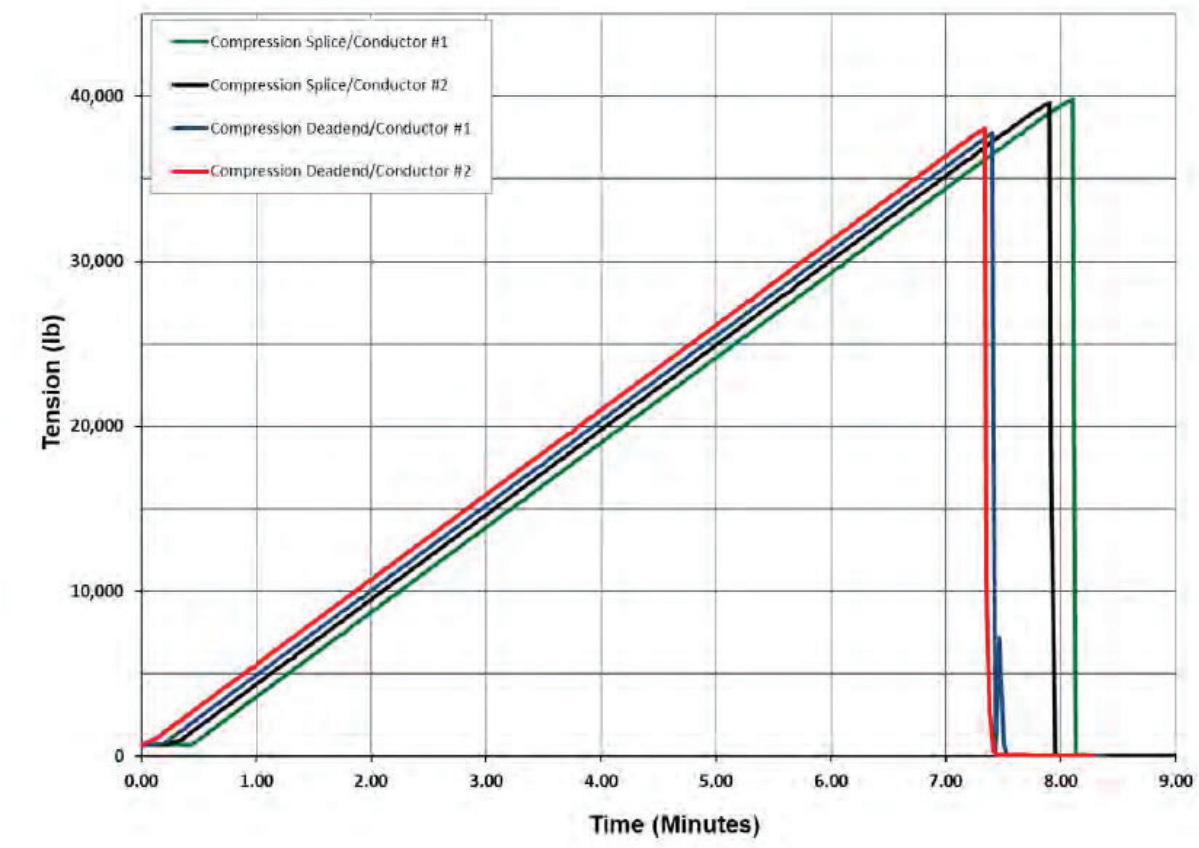

Figure 6-4. ZTT ACSS connector-conductor system UTS test: tension vs. time

The results from the UTS test of the ZTT ACSS connector-conductor samples are presented in Table 6-8. The compression dead-end and compression splice samples installed on ZTT Mallard ACSS, MA2 conductor, as evaluated, met the specified acceptance criteria in ANSI C119.4 for tensile strength.

Table 6-8. ZTT ACSS connector-conductor system UTS test results

No.	Sample Description	Test Results		
		UTS (lbs)	UTS (% Conductor RBS)	Failure Location
1	Dead-end 1	37,788	110.2	11 ft from DE
2	Dead-end 2	38,077	111.0	5 ft from DE
3	Splice 1	39,827	116.1	1 ft from epoxy
4	Splice 2	39,612	115.5	12.5 ft from epoxy

Summary

Each connector-conductor system tested had an ultimate breaking strength greater than 95% of the RBS of the associated conductor (see Table 6-9 and Figure 6-5).

Table 6-9. UTS of all connector-conductor systems based on the % RBS of the associated conductor

Conductor Brand	Sample No.	Sample Description	UTS (%RBS of Conductor)
General Cable	1	Dead-end 1	101.3
	2	Dead-end 2	96.9
	3	Splice 1	98.2
	4	Splice 2	100.8
LS Cable	1	Dead-end 1	104.1
	2	Dead-end 2	104.1
	3	Splice 1	104.2
	4	Splice 2	104.3
Southwire	1	Dead-end 1	110.8
	2	Dead-end 2	110.9
	3	Splice 1	111.4
	4	Splice 2	111.4
ZTT	1	Dead-end 1	110.2
	2	Dead-end 2	111.0
	3	Splice 1	116.1
	4	Splice 2	115.5

As can be seen in Figure 6-5, there is a correlation to the UTS of the conductor and the UTS of the connector-conductor system, as expected.

For both the dead-end and the splice, the UTS of the LS Cable connector-conductor systems broke slightly higher (average of 3.2%RBS) than that of the bare conductor. This is an unexpected result, seeing as though, typically splices and dead-ends are weaker than the bare conductor. For the General Cable conductor, the connector-conductor systems broke slightly lower than that of the bare conductor (average of -2.7%RBS). The ZTT dead-end connector-conductor systems had the greatest difference between the UTS of the system vs the UTS of the bare conductor (average of -5.4%RBS; however, the UTS of the bare conductor was 116%RBS. The difference between the General Cable test is more significant, seeing that the UTS of the bare conductor is only slightly higher than its RBS (UTS of General Cable conductor is 102%RBS). The Southwire connector-conductor systems UTS is very similar to that of its bare conductor UTS (0.125%RBS difference between the system and the conductor).

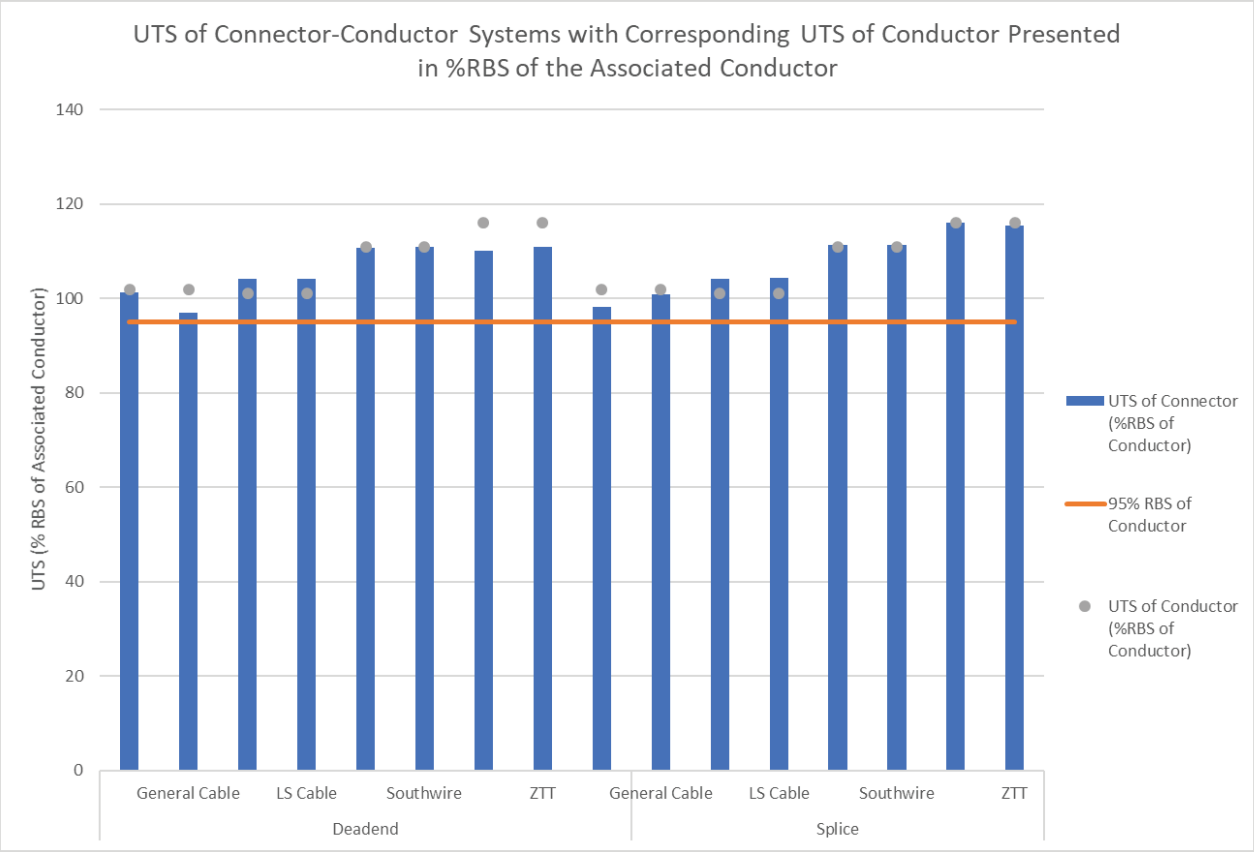

Figure 6-5. Bar graph of the UTS of all the connector-conductor systems evaluated