Electric Utility Single Input Wire (SIW) Compressed Conductors for Electric Utility Low Voltage Cable

The trend today for US utility customers is to specify compressed aluminum conductors for their Low Voltage (LV) 600 volt underground and overhead power cable products. Starting over a decade ago, for underground secondary cable, General Cable's manufacturing plants and the industry as a whole started to migrate to SIW compressed stranding from unilay compressed stranding. Today, some sizes of the SIW compressed stranding may be used for the insulated phase conductors in overhead service drop and secondary multiplex assemblies. From a manufacturing perspective, the introduction and acceptance of the SIW product results in shorter lead times and better security of supply for these cable products.

SIW compressed stranding is defined by ASTM B901; Standard Specification for Compressed Round Stranded Aluminum Conductors using Single Input Wire Construction. Class B Unilay compressed stranding is defined by ASTM B231; Standard Specification for Concentric-Lay-Stranded Aluminum 1350 Conductors. SIW compressed stranding uses combinations of a fewer number of individual drawn wire sizes to produce finished conductor sizes from 1 AWG to 500 kcmil. As shown in the table below, when you compare a SIW compressed conductor and a Unilay compressed conductor for some sizes there will be a difference in the number of strand wires.

Conductor Size	Unilay Compressed ASTM B231		SIW Compressed ASTM B901	
	Nominal Diameter	Required # of Wires	Nominal Diameter	Required Minimum # of Wires / (Typical Actual)
1 AWG	0.313"	19	0.313"	7 / (7)
1/0 AWG	0.352"	19	0.352"	7 / (7)
2/0 AWG	0.395"	19	0.395"	11 / (12)
3/0 AWG	0.443"	19	0.443"	15 / (19)
4/0 AWG	0.498"	19	0.498"	17 / (19)
250 kcmil	0.542"	37	0.542"	18 / (23)
350 kcmil	0.641"	37	0.641"	24 / (32)
500 kcmil	0.766"	37	0.766"	30 / (36)

For the electrical utility user, using a cable built with either SIW compressed conductors or with unilay compressed conductors is completely interchangeable. The conductor diameter and dc resistance requirements are identical, as is the equivalent aluminum cross-sectional area. ANSI C119.4 connectability testing has verified that the same connector accessories are compatible. Cable users have also provided feedback that LV cables made with SIW compressed stranded conductors are easier to train (increased flexibility and reduced springback) than LV cables made with reverse concentric Class B compressed stranded conductors.

We believe that the benefits of improved cable installation, along with the opportunity for increased product availability due to shorter lead times, make the SIW compressed conductors an excellent design option to incorporate into the utility customer's LV aluminum cable specification or purchase order.

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