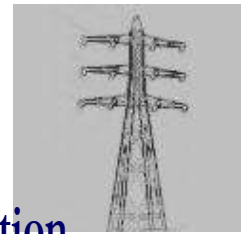


# High Temperature Conductors



**More than 50% power increase with the same cross section.**

## Application

Changing to high temperature conductors (Hot and Black conductors) has approved as an excellent technical and economical solution for revitalisation of old overhead lines or for bottleneck applications.

## Product Description Hot Conductors

Starting from high grade aluminium (99,7 % purity) an alloy containing, among other elements, small amounts of zirconium is produced. With additional processing, a structure with a high recrystallization temperature is attained, thereby the mechanical properties of this material are maintained in continuous operation at higher temperatures (150 °C). In this way the current carrying capacity could be increased by over 50%.

Because of the combination of temperature resistant aluminium (TAL) and aluminium clad steel wires (ACS) the stranding can be done without grease. The mechanical properties of the temperature resistant aluminium (TAL) wires correspond to those of pure aluminium (99,5%)

## Product Description Black Conductors

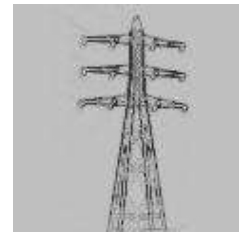
Coated hot conductors are a further development. These are blackened by a patented spray process with a permanent layer of black polyurethane coating on their surface. The black surface means a higher radiation of temperature, so the current carrying capacity could be increased by up to 70% in total.

The coating of the conductors fulfils all requirements:

- UV stability
- temperature stability
- maximum adhesion
- removable at the clamping range
- metal-to-metal contact between the layers of the cable

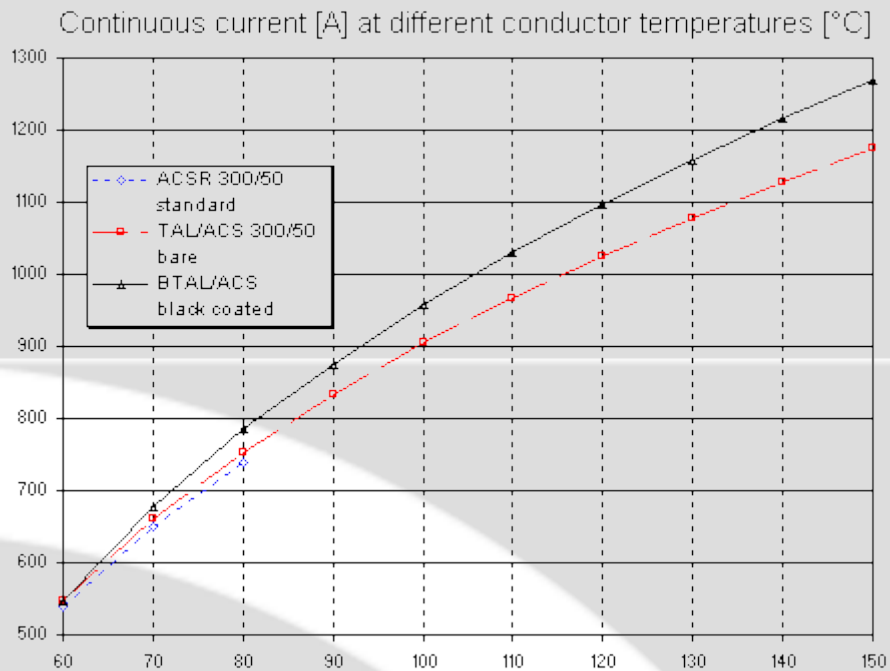


# High Temperature Conductors



## Mechanical and Electrical Properties

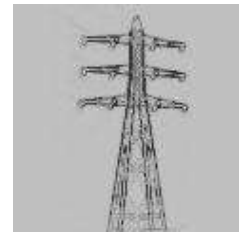
Due to the higher temperature tolerance of the conductors up to 150 °C more energy can be transmitted compared to standard aluminium steel conductors (ACSR) of the same section:



This advantage is achieved by the special properties of the temperature resistant aluminium (TAL) wire:

	conductivity [S*m/mm <sup>2</sup> ]	min. tensile strength [N/mm <sup>2</sup> ]	Modulus of elasticity [N/mm <sup>2</sup> ]	coefficient of expansion [1/°C]	permissible maximum operating temperature [°C]		
					continuous operation	short-time < 30 min	short-circuit
TAL	34,8	160 - 190	60.000	2,3 * 10E-5	150	180	260
E-AL	35,38	160 - 190	60.000	2,3 * 10E-5	80	80	160

# High Temperature Conductors



Using black conductors (BTAL/ACS) increases the transmission power additionally. The comparison of several sections shows this advantage:

nominal section [mm <sup>2</sup> ]	linear weight [kg/km]		calculated tensile strength [kN]		resistivity at 20 °C [Ω/km]		permissible continuous current [A]		
	ACSR	TAL/ACS	ACSR	TAL/ACS	ACSR	TAL/ACS	ACSR	TAL/ACS	BTAL/ACS
120/20	491	467	44,50	45,09	0,2376	0,2286	410	645	690
240/40	980	932	85,12	87,49	0,1188	0,1144	640	1010	1090
300/50	1227	1167	105,09	108,06	0,0949	0,0914	740	1170	1270
560/50	1940	1879	146,28	149,25	0,0515	0,0508	1040	1715	1870

\*) AL/St = aluminium/steel (standard conductor)  
 ACSR  
 TAL/ACS = temperature resistant aluminium/ACS (Hot Conductor)  
 BTAL/ACS = temperature resistant aluminium/ACS, black coating (Black Conductor)

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