

### Special Alloys (Machinable Bronzes) BY44 | BY51



Material Designation		
Sundwiger	BY44	BY51
DIN-EN Symbol	CuSn4Zn4Pb4	CuSn5Pb1
DIN-EN	CW456K	CW458K
UNS	C54400	C53400
JIS	C5441	C5341

Nominal Composition (mass content in %)		
Sundwiger	BY44	BY51
Cu	Balance	Balance
Sn	4	5
Zn	4	< 0.3
Pb	4	1
Fe	< 0.1	< 0.1
P	0.4	0.4
Others	< 0.2	< 0.4

Available Dimensions		
Round wire	1.2 - 6 mm in coils	max. 200 kg
	1.8 - 6 mm on stands	max. 1500 kg
	0.5 - 3 mm on reels	max. 1000 kg
	1.5 - 3 mm on acropaks	max. 400 kg
	On request: in drums	max. 400 kg
	On request: 2 - 5 mm in bars, sheared ends (length ≤ 3.5 m)	max. 500 kg

Reference to Standards	
DIN	EN 12166

About the Alloy
<p>BY44 is a leaded multi-component bronze which shows very good machinability and good corrosion resistance. It is also distinguished by its excellent spring properties.</p> <p>BY44 is used for electrical contacts that need to be manufactured as turned parts.</p> <p>BY44 can be drawn over 800N/mm<sup>2</sup>, which makes it significantly stronger than leaded brass materials. Compared with leaded brass materials, BY44 is resistant to stress-corrosion cracking.</p> <p>BY51 offers – like a conventional bronze – good cold forming properties and good corrosion resistance in addition to moderate machinability.</p> <p>BY51 is used in electrical engineering and in the automotive industry for various applications. While the desired tensile strength is adjusted by cold forming, the shape of the component can be produced by machining.</p> <p>Compared with leaded brass materials, BY51 is also resistant to stress-corrosion cracking.</p>

Typical Applications
<ul style="list-style-type: none"> <li>• Turned contact elements</li> <li>• Pins</li> </ul>

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Physical Properties*			
Sundwiger	BY44	BY51	
Electrical conductivity	≥11 ≥19	≥9.8 ≥17	MS/m % IACS
Thermal conductivity	80	80	W/(m·K)
Thermal expansion coefficient**	17	17	10 <sup>-6</sup> /K
Density	8.8	8.8	g/cm <sup>3</sup>
Modulus of elasticity	118	117	GPa = kN/mm <sup>2</sup>
Machinability index compared to CuZn39Pb3	90	60	%
* Reference values at room temperature			
** Between 20 and 300 °C			

Mechanical Properties*		
Sundwiger	BY44	BY51
Tensile strength in N/mm <sup>2</sup> , soft	≤ 450	≤ 450
Elongation A100 in %, soft	8	8
Tensile strength in N/mm <sup>2</sup> , hard	≥ 720	≥ 720
* Reference values at room temperature		

#### Your Local Contact Person

##### Worldwide

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