

A cost effective alternative to high tin containing phosphor bronze alloys, C511 offer designers many of the same performance advantage. Offering only slightly lower strength and higher conductivity than C510 or C521 this alloy is a great choice for applications requiring functional spring members including: relay contacts, electronic connector, automotive terminals and contacts springs. For more information contact Olin Brass Market Development Engineering at 618-258-5255, OlinBrass.com or email us at info@olinbrass.com.

Chemical Composition

Copper¹	Remainder
Tin	3.5-4.9%
Phosphorous	0.03-0.35%
Lead	0.05% Max
Iron	0.10% Max
Zinc	0.30% Max

¹ Cu + Named Elements, 99.5% min

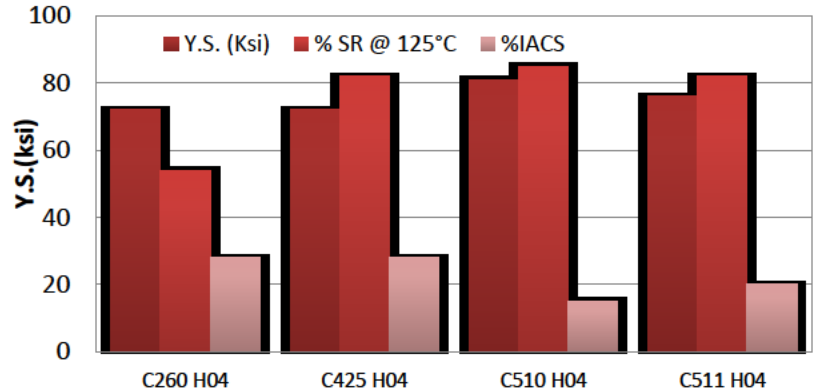


Figure 1: Comparison of Yield Strength, Electrical Conductivity and Stress Relaxation performance (@ 1000hrs) of select high strength spring materials

Physical Properties

	English Units	Metric Units
Density	0.320 lb/in ³ @ 68°F	8.86 g/cm ³
Thermal Conductivity	48.4 BTU-ft/ft ² -hr-°F	86 W/m°K
Electrical Resistivity	52.0 ohm circ mils/ft	8.7 microhm-cm
Electrical Conductivity (annealed)	20% IACS*	0.116 megamho/cm
Modulus of Elasticity	16,000,000 psi	110 kN/mm ²
Thermal Capacity(Specific Heat)	0.090 Btu/lb/F° @ 68°F	377.1 J/kg · °C @ 20°C
Coeff. Of Thermal Expansion 68-572°F (20-300°C)	9.90 PPM/°F	17.82 PPM/°C

*International Annealed Copper Standard

Mechanical Properties

Temper ¹	Tensile Strength		Yield Strength ²		% Elongation ²	Typical 90° Bend Formability GW/BW ³	
	ksi	N/mm ²	ksi	N/mm ²			
Annealed	46-54	315-370	22	150	47	-	-
1/4 Hard	46-58	315-400	35	240	36	-	-
1/2 Hard	55-70	380-485	56	385	21	-	-
3/4 Hard	67-82	460-565	72	495	10	0.5	0.8
Hard	72-87	495-600	76	525	7	0.8	1.3
Extra Hard	84-99	580-685	88	605	3	1.3	2.0
Spring Hard	91-105	625-725	94	650	3	1.8	4.5
Extra Spring	96-109	660-750	98	675	2		

¹ Mechanical properties subject to change. All tempers listed are made to a Tensile Strength specification unless otherwise noted.

² Nominal Values ³ DATA FOR REFERENCE ONLY. R/T = Bend Radius/Material Thickness <0.016" (0.4mm) thick, 11/16 (17.5mm) wide.

Olin Brass Headquarters
4801 Olympia Park
Plaza, Suite 3500
Louisville, KY 40241
Ph: 502-873-3000

GBC METALS ASIA PACIFIC PTE LTD
1 Kim Seng Promenade
Great World City, E Tower
Singapore 237994
Ph: 65.6238.1155

GBC METALS LLC SHANGHAI
Room 2004 Aetna Tower
No. 107 Zunyi Rd
Shanghai 200051 China
Ph: 86.21.6237.5898

OLIN BRASS-HEADQUARTERS

4801 Olympia Park
Plaza, Suite 3500
Louisville, KY 40241
Ph: 502-873-3000

OLIN BRASS - MILL

285 Lewis & Clark Blvd.
East Alton, IL 62024
Ph: 618-258-5255

BRYAN METALS INC.

1103 South Main Street
Bryan OH 43506-0487
Ph: 419-636-4571
Fx: 419-636-3994

SOMERS THIN STRIP

215 Piedmont Street
Waterbury, CT 06706
Ph: 203-597-5000
Fx: 203-597-5081

A.J. OSTER COMPANY

180 ALEXANDRA WAY
Carol Stream, IL 60188-2068
Ph: 630-260-1040
Ph: 800-323-9644
Fx: 630-260-1102

A.J. OSTER CARIBE, INC.

Centro industrial Rio Canas
Lote 29, P.M.B HC-01
Box 29030
Caguas, PR 00725
Ph: 787-747-7575

A.J. OSTER FOILS, INC.

2081 McCrea Street
Alliance, OH 44601-2793
Ph: 330-823-1700
Ph: 800-321-9750
Fx: 330-823-1705

A.J. OSTER WEST INC.

22833 La Palma Avenue
Yorba Linda, CA 92887-4767
Ph: 714-692-1000
Ph: 800-933-5933
Fx: 714-692-1225

A.J. OSTER COMPANY

457 Industrial Drive
Warwick, RI 02886
Ph: 401-739-0800
Fx: 401-739-1276

INTERNATIONAL SALES OFFICES & FACILITIES**GBC METALS ASIA PACIFIC PTE LTD.**

1 Kim Seng Road Promenade
Great World City, East Tower #13-04
Singapore 237994
Ph: 65.6238.1155
Fx: 65.6238.0660

GBC METALS LLC SHANGHAI

Room 2004, Aetna Tower
No. 107 Zunyi Road
Shanghai 200051, China
Ph: 86.21.6237.5898
Fx: 86.21.6237.5805

OLIN LUOTONG METALS (GZ) Co Ltd

No. 8 Jung Gong Road, East District
Guangzhou Economic Technological & Dev District
Guangzhou, P.R. China 510530
Ph: 86.20.8226.6818
Fx: 86.20.8226.6718

DOWA-OLIN METAL CORPORATION

2630, Shingai
Iwata-shi, Shiznoka-ken
438, Japan
Ph: 81.538.37.5111
Fx: 81.538.37.0147

OLIN BRASS - INTERNATIONAL DISTRIBUTORS**UNITED KINGDOM / IRELAND****Aurubis UK Ltd.**

Rabone Park, Smethwick
West Midlands B66 2NN
England
Ph: 44 (0) 121 555 1199
Fx: 44 (0) 121 555 1188
Email: info-uk@aurubis.com
Website: www.aurubis.com

EUROPE**Walter Türkis GmbH**

Struthstrasse 35
55743 Idar-Oberstein
Germany
Ph: 49 (0) 6781 62-0
Fx: 49 (0) 6781 62-28
Email: service@tuerkis-schneid-center.de
Website: www.tuerkis-schneid-center.de

OLIN BRASS MEXICO S.A. de CV

Av. La Griega # 117
Parque Industrial Queretaro
Santa Rosa, Jaurgui
Queretaro, Mexico 76220
Ph: 52 442 2 29 40 00
Fx: 52 442 2 29 40 29