METRIC

Brass Alloy SM 2965

Comparable standards: ISO: CuZn35P0.025
ASTM: -
EN: -
JIS: -

Chemical Composition

Element	Unit	Range
Copper	%	64.5 - 66.5
Phosporus	%	0.015-0.033
Lead	%	max. 0.05
Iron	%	max. 0.05
Zinc	-	remainder

Dimensions

Nominal width mm	Tolerance
- 50	± 0.05
50 - 100	± 0.075
100 - 200	± 0.10
200 - 400	± 0.15
400 - 600	± 0.20

Nominal thickness mm	In steps of
0.080 - 0.250	0,005
0.250 - 0.400	0,010
0.400 - 1.000	0,050
1.000 - 2.000	0,100

Notes:
- Unslitted width [full master coil width] possible [app. 640 mm wide]
- Thickness tolerance up to 0.150 mm nominal: ± 0.003 mm
- Thickness tolerance over 0.150 mm nominal: ± 2% [rounded upwards to nearest micron]

Physical Properties

Density	kg/m^3	8500
Melting temperature	^oC	>910
Specific heat	$kJ/(kg\ ^oC)$	0.377
Electrical conductivity	MS/m	15
Electrical conductivity	**IACS %**	**26**
Electrical resistivity	nΩ meter	67
Thermal conductivity	$W/(m\ ^oC)$	120
Thermal expansion 20-300^{o}C	$10^{-6}\ ^oC^{-1}$	20
Young's modulus E	MPa	109 000

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Mechanical Properties - Standardized Tempers

Temper			Yield	Tensile	Elongation	Hardness	Grain
Luvata	ASTM	Comments	$R_{p0,2}$ MPa	R_m MPa	A_{50} %	HV	size µm
Annealed to temper							
72				300-370	20-	65 - 85	
77	O82	½ Hard	(260-)	380-460	21-	96-124	< 10
Rolled to temper							
86B	H 02	½ Hard		390-480	20-	118-148	<15

Mechanical Properties - Non Standardized Tempers

Temper			Yield	Tensile	Elongation	Hardness	Grain
Luvata	ASTM	Comments	$R_{p0,2}$ MPa	R_m MPa	A_{50} %	HV	size µm
Annealed to temper							
71		Soft	(-160)	280-360	40-	60-80	
74				330-390		75-95	
75	O81	1/4 Hard	(170-)	350-410	21-	80-100	
76				370-430		88-112	
78				420-470	9-	105-135	
79				440-480		115-145	
Rolled to temper							
82	H 01	1/4 Hard		340-405		95-115	
83				355-420		103-127	
84				370-435		108-135	
85				380-450		113-143	
87				410-480		125-155	
88				425-495		132-162	
89	H 03	3/4 Hard		440-510		140-170	
91				465-535		145-175	
92	H 04	Hard		490-560		160-190	
93				515-585		170-200	
95	H 06	Extra Hard		565-635		180-210	
97	H 08	Spring		615-685			

Notes:
- Material is produced to stated hardness requirements
- Stated ranges for yield strength, tensile strength, elongation and grain size are typical values, and for information only
- Refer to alloy sheet SM 1067 regarding mechanical properties for materials for tank and header applications

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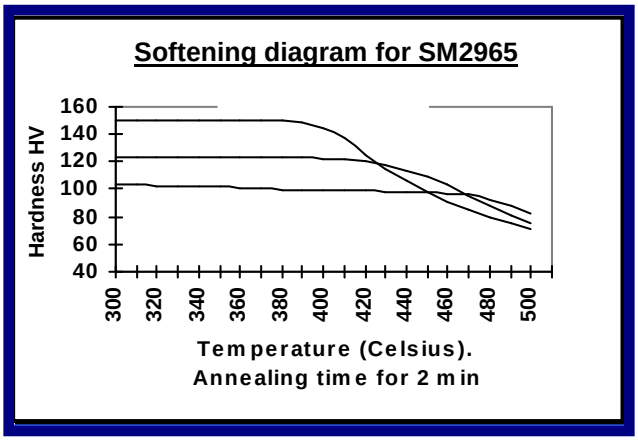
Heat Resistance and Softening Characteristics



- Temperatures for 1 min. annealing time will be 10 °C higher
- Temperatures for 4 min. annealing time will be 10 °C lower

Heat Treatment

Soft annealing	450 - 550	°C
Time dep. on size and volume: propose	2	hours
Stress relief annealing	275 - 325	°C

Formability

Valid for all tempers:
Both at elevated as well as room temperature
easy to form, however decreasing with increased hardness.

Below: minimum bending radius. t =gauge

		t = < 0.25 mm		t = > 0.25 mm	
Temper	Hardness	good way	bad way	good way	bad way
Soft	HV 65-125	0 x t	0 x t	0 x t	0 x t
Hard	HV 120-155	0 x t	0 x t	0 x t	1 x t
	HV 150-180	0 x t	1 x t	0 x t	2 x t
	HV 170-200	0 x t	2 x t	1 x t	3 x t

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Welding

Due to the very high zinc content, some counter-measures to stop vaporization of zinc are necessary. Otherwise the alloy is suitable for soldering, brazing and welding.

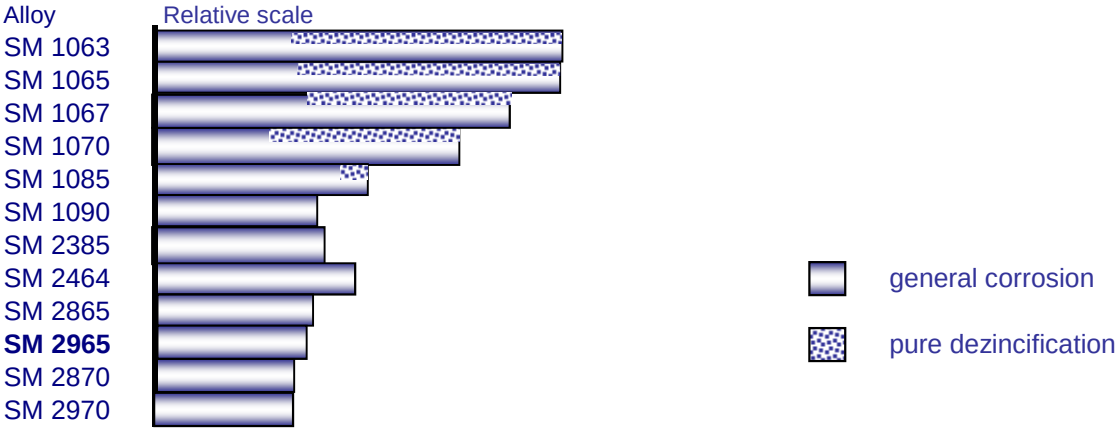
Surface Treatment.

Colours are gold- to yellowish but could easily be influenced by many types of surface treatments.

Corrosion Properties

Durable to water and organic compounds, as well as land-, see- and industrial atmospheres.
Inhibited brass with improved resistance to dezincification for heat exchangers.

Dezincification comparison:



SM 2965 is an alloy suitable for many radiator applications.

To minimize the risk for **stress corrosion cracking** we strongly recommend stress-relief annealing after all cold forming operations.
In general the higher the copper content, the better the resistance to stress corrosion cracking.