MATERION

Product Brief

MACHINABLE LEAD (Pb)-FREE ALTERNATIVES TO LEAD-CONTAINING ROD

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The European RoHS regulation restricts the use of certain substances including Lead (Pb) in electrical and electronic equipment (EEE). However, Exemption 6c of Annex III allows for up to 4% Pb by weight to be added to copper alloy rod and wire in order to improve machinability in automatic screw machining processes. The current exemption 6c was set to expire in July 2021. That expiration date is no longer in force. In 2020, the European Commission (EC) launched a new RoHS review project to determine whether or not to extend Exemption 6c. A decision to renew Exemption 6c is not expected until early 2022. If renewed, the use of lead in copper alloys will be extended for another 4 years. If rejected, the EC will grant a 12-to 18-month transition period to allow the industry time to find alternatives to Pb-containing copper alloy rod. The current exemption 6c will continue **as is** until the EC reaches a decision.

Materion feels strongly that this extension of Exemption 6c will be granted; however, Materion researchers continue to work diligently to develop alternative non-Pb-containing, machinable alloys to meet future RoHS compliance. Currently, Materion offers several Pb-free alloys that may not machine as well as Pb-containing products but provide comparable performance. You may use the comparison table below to determine the appropriate substitute for any application on a case-by-case basis, factoring in strength, conductivity, stiffness and relative magnetic permeability. Please consult with Materion Customer Technical Service or your local Materion sales engineer to help you determine the suitability of a substitute for your application.

	Chemical Composition	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation % in 50 mm	Electrical Conductivity % IACS	Elastic Modulus (GPa)	Magnetic Permeability (relative)
Compare M25 HT Rod and Wire With Potential Replacements							
M25 H Rod	CuBe2Pb	520 - 720	590 - 900	8 - 30	15 - 20	131	<1.006
M25 HT Rod	CuBe2Pb	1000 - 1380	1210 - 1550	2 - 9	25 - 30	131	<1.006
25 H Rod	CuBe2	520 - 720	590 - 900	8 - 30	15 - 20	131	<1.006
25 HT Rod	CuBe2	1000 - 1380	1210 - 1550	2 - 9	25 - 30	131	<1.006
ToughMet® 3 H Wire	CuNi15Sn8	895 - 1105	930 - 1140	3 - 15	7	144	<1.01
ToughMet® 3 HT Wire	CuNi15Sn8	1240 - 1450	1275 - 1480	2 min	7	144	<1.01
ToughMet® 3 TS160U Rod	CuNi15Sn8	1035 min	1105 min	3 min	7	144	<1.01
ToughMet® 2 HT Rod	CuNi9Sn6	720 min	790 min	6	13 - 14	117	<1.001
Compare Brush® 1915 Rod and Wire With Potential Replacements							
Brush 1915 HT Rod	CuNiPbP	380 - 660	480 - 720	4 - 30	50 min.	124	
3 HT Rod	CuNi2Be	660 - 860	760 - 790	5 - 25	48 - 60	138	
PerforMet® Wire	CuNiSiCr	790 min	860 min	7 min	37	124	

MATERION Global Headquarters
6070 Parkland Boulevard
Mayfield Heights, OH 44124 USA

Contact Us:
materion.com/ContactPAC