MS-110 E

Page:1of3Supersedes:24-Aug-2020Effective:4-Mar-2021

#### 1.0 Purpose

1.1 This document establishes the requirements for furnace thermocouples (TC) to be used in Meyer Tool's coating, heat treating, and brazing processes.

#### 2.0 Certificate Required

- 2.1 Each lot must be accompanied with a Certificate of Compliance. The analysis must state that the material meets or exceeds the criteria listed in the Meyer Tool purchase order and/or that listed below. Calibration and certifications shall be traceable to NIST or other equivalent national certification agency.
- 2.2 Reporting shall meet the requirements of AMS-2750 latest revision.
- 2.3 Upon receipt, it must be verified that the errors of the new TC's, when combined with maximum allowable calibration errors of the instrument/connector/lead wire, do not cause an SAT violation. Document on form MTI-617

#### **3.0** Coating Furnace Thermocouples

- 3.1 Control, monitoring, and overtemp TC's must be:
  - 3.1.1 Type K nonexpendable with correction factors meeting the requirements of Table 1.
  - 3.1.2 Correction factors must be the average of the ends.
  - 3.1.3 End to end difference in correction factors may not exceed 2° F.
  - 3.1.4 Limits apply from 1000°F to 2250°F.

#### 4.0 Vacuum Furnace Thermocouples

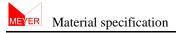
- 4.1 Workload TC's must be:
  - 4.1.1 Type K non-expendable with correction factors compliant with Table 1.
- 4.2 Control TC's must be:
  - 4.2.1 Type R nonexpendable with a correction factor of +/- 1.0 ° F or +/- 0.1% of reading max, whichever is greater.

Date		Date					
Engineering	KEITH JONES	Quality	ROB SENITZA				
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4.3 For all TC's:

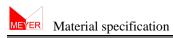
- 4.3.1 Correction factors must be the average of the ends.
- 4.3.2 End to end difference in correction factors may not exceed 2° F.
- 4.3.3 Limits apply from  $1000^{\circ}$  F to  $2250^{\circ}$  F.



### TABLE 1

# Allowable correction factors for Type K workload TC's

Temp	Allowable TC Error	Allowable TC%	
700	0.8	0.11%	
750	1.0	0.13%	
800	1.2	0.15%	
850	1.4	0.16%	
900	1.6	0.18%	
950	1.8	0.19%	
1000	2.0	0.20%	
1050	2.2	0.21%	
1100	2.4	0.22%	
1150	2.6	0.23%	
1200	2.8	0.23%	
1250	3.0	0.24%	
1300	3.2	0.25%	
1350	3.4	0.25%	
1400	3.6	0.26%	
1450	3.8	0.26%	
1500	4.0	0.27%	
1550	4.2	0.27%	
1600	4.4	0.28%	
1650	4.6	0.28%	
1700	4.8	0.28%	
1750	5.0	0.29%	
1800	5.2	0.29%	
1850	5.4	0.29%	
1900	5.6	0.29%	
1950	5.8	0.30%	
2000	6.0	0.30%	
2050	6.2	0.30%	
2100	6.4	0.30%	
2150	6.6	0.31%	
2200	6.8	0.31%	
2250	7.0	0.31%	
2300	7.2	0.31%	



## **Revision History**

Rev. Ltr.	Parg.	Description of Revision	Date Rev.	Rev. By
А	3.0, 4.0	Separated out requirements, added that correction factors are average	6-3-15	K. Jones
А	All	Formatting	6-3-15	S. Lester
В	2.1	New statement requiring NIST or equivalent	6-23-17	K. Jones
В	All	Formatting	6-23-17	K. Jones
С	3.1.4, 4.3.3	Changed lower limit from 750F to 1000F	2-26-2020	K. Jones
D	2.2	New section covering Alternate SAT form MTI-617	8-24-2020	K. Jones
Е	2.2	New section added requiring reporting to conform to AMS-2750 latest rev	3/4/2021	K. Jones
Е	4.2.1	Changed limits on type R from 0.75% max to 1.0 ° F or 0.1% max whichever is greater (per AMS-2750 Rev F)	3/4/2021	K. Jones