

**G. W. LISK COMPANY INC.**  
**ENGINEERING PROCESS SPECIFICATION**

**Material Specifications for Metals**  
**EPS-106-S**  
**Revision E**

**Distribution**  
Intranet

	Signature	Date
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## 1.0 SCOPE

This specification describes material specification standards for use in design and operation of product. This standard shall provide guidelines for metals used in all phases of the design and production process of product.

## 2.0 APPLICATION

The *Material Specification List* shall be used to purchase all stock for the manufacture of product. The columns list *primary* and *alternate* specifications for designing and manufacturing product, but the *primary* column shall be the preferred specification and basic default for purchasing and stocking material.

Existing material in stock without certification to listed specification(s) shall require review by the metallurgical engineer with approval stamp to route or packing slip prior to use for production. Aerospace products shall require stamp with cross-functional review by metallurgical engineer, quality & engineering before used in production.

**Note: All specification requirements shall be to the latest or most current revision unless specified otherwise.**

## 3.0 ENGINEERING DRAWINGS

Engineering drawings shall not require a material specification defined on the detail print when use of the *primary* standard or listed *alternate* specification from the *Material Specification List* is acceptable. If a customer defined specification is required, then it shall be identified on the print. It is the goal of this specification to provide material with certification to a standard and to be controlled by the *primary* standard whenever possible. If engineering specifies a material not included on the *Material Specification List*, then review with the metallurgical engineer shall be required prior to accepting as design requirement.

## 4.0 RECORDS

Material certifications shall be supplied with all incoming material in accordance with purchase order requirements. Steel receiving shall review all orders in accordance with PWI 15.01.03 for accepting and controlling incoming material.

## 5.0 QUALITY REQUIREMENTS

Material audits shall occur in accordance with PWI 15.01.03 to validate supplier certifications for chemistry and other requirements if specified. Periodic audits shall occur semi-annually at minimum for “other” requirements.

## Material Specification List

Material	Primary Specification	Alternate Specification			
		Z	Y	X	W
302	AMS-QQ-S-763	ASTM A276	AMS 5637	AMS 5688	
303	ASTM A582A/582M	AMS 5640			
304L	AMS-QQ-S-763	ASTM A276	AMS 5647	ASTM A240	
304L TUBING	AMS 5647	ASTM A269	ASTM A213		
304	AMS-QQ-S-763	ASTM A276	AMS-5639	ASTM A240	
304 TUBING	ASTM A269	ASTM A511	ASTM A312 PIPE	AMS 5513	
316L	AMS-QQ-S-763	ASTM A276	AMS 5653	ASTM A479	
316L TUBING	AMS 5653	ASTM A269			
316LT SPECIAL	AMS 5573				
316	AMS-QQ-S-763	ASTM A276	AMS 5648	ASTM A479	
321	AMS-QQ-S-763	ASTM A276	AMS 5645	ASME SA-213	
321 TUBING	AMS 5645	ASTM A269	ASTM 213	AMS 5570	AMS 5557 MIL-T-8808
347	ASTM A479	AMS-QQ-S-763			
410	AMS-QQ-S-763	ASTM A276	AMS 5612 or 5613		
416 (also 416BQ)	ASTM A582A/582M	AMS 5610			
420	AMS-QQ-S-763	ASTM A276			
420F	ASTM A582A/582M	AMS 5620			
430	AMS-QQ-S-763	ASTM A276	AMS 5627		
430F	ASTM A582A/582M	ASTM A581			
430FR	ASTM A838 ALLOY 2				
431	ASTM A276	AMS 5628			
440C	AMS-QQ-S-763	ASTM A276	AMS 5630		
446	AMS-QQ-S-763	ASTM A276			
13-8PH	AMS 5629				
15-5PH	AMS 5659				
17-4PH	AMS 5643				
17-7PH	AMS 5568				

Material	Primary Specification	Alternate Specification			
		Z	Y	X	W
EBRITE®	ASTM A479				
ELGILOY®	AMS 5833 CHEMISTRY ONLY				
MP35N®	AMS 5758	ASTM F562	AMS 5844 or 5845		
GREEK ASCOLOY	AMS 5616				
CC-18FM®	SPECIALTY ALLOY -CARPENTER				
CC-13FM®	SPECIALTY ALLOY-CARPENTER				
A286	AMS 5731	ASTM A638/A638M	AMS 5737		
CUSTOM 455®	AMS 5617				
NICKEL IRON ALLOY 49 High Perm 49® 4750 alloy® 48-Ni®	ASTM A753 ALLOY 2	MIL-N-14411 COMPOSITION 3&4			
NICKEL IRON ALLOY 80 HyMu 80® 4-79 Permalloy® Hipernom® Mu-metal®	ASTM A753 ALLOY 4	MIL-N-14411 COMPOSITION			
HIPERCO ALLOY 50®	ASTM A801 ALLOY 1				
INCONEL 718	AMS 5662	AMS 5668			
INCONEL 718 TUBING	AMS 5589				
TITANIUM 6AL-4V GRADE 5	ASTM B348	AMS 4930			
MAGNETIC IRON Remko HP® ASTM A848	SPECIALTY ALLOY-UDDEHOLM ASTM A848				
AERMET 100®	AMS 6532				
SILICON C®	ASTM A867 ALLOY 3				
SILICON B-FM®	ASTM A867 ALLOY 2F				
SILICON B®	ASTM A867 ALLOY 2				
22-13-5 (NITRONIC 50®)	AMS 5764	ASTM A276	ASTM F1314		
21-6-9 (NITRONIC 40®)	AMS 5656	ASTM A276	AMS 5561		
NITRONIC 60®	ASTM A479				

Material	Primary Specification	Alternate Specification			
		Z	Y	X	W
1008	ASTM A108	ASTM A29/A29M			
1018	ASTM A108	ASTM A29/A29M			
1020	ASTM A108	ASTM A29/A29M			
1026	ASTM A29/A29M	ASTM A512 or A513 TUBING			
1117	ASTM A108	ASTM A29/A29M			
1140	ASTM A29/A29M-CHEMISTRY	ASTM A108			
1141	ASTM A108				
1144 STRESSPROOF®	ASTM A311/A311M	ASTM A108		ASTM A29/A29M	
1215	ASTM A108	ASTM A29/A29M			
12L14	ASTM A108	ASTM A29/A29M			
MECH STEEL TUBE	ASTM A512 or A513	ASTM A519			
4130	ASTM A29/A29M	ASTM A331			
4140	ASTM A29/A29M	ASTM A331			
41L40	ASTM A29/A29M	ASTM A331			
DURA-BAR G2®	DURA-BAR				
DURA-BAR 65-45-12	DURA-BAR				
52100	AMS 6440	ASTM A29/A29M	ASTM A295		
ALUMINUM BRONZE C63000	ASTM B150/B150M	AMS 4640			
AL2011	ASTM B211	AMS-QQ-A-225/3			
AL2024	ASTM B211 OR B221	AMS 4120	AMS-QQ-A-225/6	AMS-QQ-A-200/3	
AL6020	N/A				
AL6061	ASTM B211 OR B221	AMS 4117			
AL6061 TUBING	ASTM B210				
AL7075	ASTM B211 OR B221	AMS 4186	AMS-QQ-A-225/9		
BERYLLIUM COPPER	ASTM B196				
COPPER BERYLLIUM	ASTM B441				
BRASS 360	ASTM B16	AMS 4610			
BRASS TUBE 260	ASTM B19	AMS 4505	ASTM B135		
COPPER 110	ASTM B3	AMS 4500	ASTM B187		
COPPER 101	ASTM B3	AMS 4700			
BRASS TUBE 330	ASTM B135	AMS 4555			

Material	Primary Specification	Alternate Specification			
		Z	Y	X	W
OILITE BRONZE	ASTM B438				
HIGH-LEADED TIN BRONZE	ASTM B505				
PHOS BRONZE B-2	ASTM B139/B139M				
SUPER OILITE	ASTM B439				
A2 TOOL STEEL	ASTM A681				
D2 TOOL STEEL	ASTM A681				
O1 TOOL STEEL	ASTM A681				
M2 TOOL STEEL	ASTM A600				
MONEL 405	ASTM B164	QQ-N-281			

## Revisions

REVISION	CHANGE	DATE	APPROVAL
N/C	Original Release	22April09	ARB
A	<ol style="list-style-type: none"> <li>1. Added AMS 5570 to 321 tubing</li> <li>2. Changed "Electrical Iron" to Magnetic Iron per ASTM A848</li> <li>3. Removed AISI 12L14&amp; ASTM A576 spec to ASTM A108 and ASTM A29</li> </ol>	4 June 09	ARB
B	<ol style="list-style-type: none"> <li>1 Added alternate specs for many materials</li> <li>2. renamed 1144 stressproof</li> <li>3. Changed spec on beryllium copper</li> </ol>	5Nov09	ARB
C	<ol style="list-style-type: none"> <li>1. Added 41L40, 4130</li> <li>2. Added AMS 5513 to 403 tubing</li> <li>3. Revised 3.0 to clarify approved use of alternate listed specs.</li> <li>4. Added letter designation to list (Z,Y,X,...)</li> </ol>	20April10	ARB
D	<ol style="list-style-type: none"> <li>1. Was Mil-N 14411B for HiPerm 49 and Hymu 80</li> <li>2. 1144 Stressproof was 1140 Stressproof.</li> <li>3. Added Silicon B</li> <li>4. Added AMS5557 for 321 tubing</li> <li>5. Switched primary with alternate for Titanium</li> <li>6. Added paragraph 2 to 2.0</li> </ol>	17March11	ARB
E	<ol style="list-style-type: none"> <li>1. Changed Hi-Perm 49 to alloy category</li> <li>2. Changed HyMu 80 to alloy category</li> <li>3. Changed Magnetic Iron to category</li> <li>4. Added 420 Stainless Steel</li> </ol>	14July11	ARB