

PENBERTHY

application report

Section 2000
 Application Report 2780.1
 Issued 05/05
 Replaces 11/00

For: LOW TEMPERATURE GAGE MATERIAL SELECTION

Some materials, particularly ferritic steels, change from tough to brittle behavior with a decrease in temperature. The transition temperatures and the levels of notch toughness vary with different materials. When materials are used under conditions where brittle behavior may occur, there is a danger that minor internal flaws, which would be considered non-hazardous if the material were tough, may propagate to failure (see ASTM A352 supplements for more information).

Materials suggested for RL, TL, RM, TM, TMR, RH, TH, RHR, THR, RMW, TMW, RLC and TLC series flat glass gages for low temperature applications.

GAGE

Temperature Range	Model	Suggested Materials					
		Cover	Chamber	Bolts	Nuts		
to -20° F (-29° C)	RLC/TLC	ASTM A105 Forged Carbon Steel or ASTM A216 Gr. WCB Cast Carbon Steel	ASTM A106 Gr. B Carbon Steel	ASTM A193 Gr. B7	ASTM A194 Gr. 2 or 2H Carbon Steel		
	RMW/TMW		SA-515 Gr. 70 Carbon Steel				
	RM/TM RMR/TMR RH/TH RHR/THR		ASTM A105 Forged Carbon Steel				
	RL/TL	ASTM A395 Ductile Iron					
to -50° F (-46° C)	RLC/TLC	ASTM A350 Gr. LF2 Cl. 1 Forged Carbon Steel	ASTM A333 Gr. 6 Carbon Steel	ASTM A320 Gr. L7 Steel	ASTM A194 Gr. 8M 316 STS		
	RMW/TMW RM/TM RMR/TMR RH/TH RHR/THR		ASTM A516 Gr. 70/S5 -50° F Carbon Steel				
	RMW/TMW		SA-240 316/316L STS			ASTM A320 Gr. L7 Alloy Steel	ASTM A194 Gr. 8M 316 STS
	RLC/TLC		ASTM A351 Gr. CF3M Cast 316/316L STS				
RM/TM RMR/TMR RH/TH RHR/THR	ASTM A276 316/316L STS						
to -150° F (-101° C)	RMW/TMW	ASTM A351 Gr. CF3M Cast 316/316L STS	SA-240 316/316L STS	ASTM A193 Gr. B8M Cl. 2 316 STS	ASTM A194 Gr. 8M 316 STS		
	RLC/TLC		ASTM A312 316/316L STS				
	RM/TM RMR/TMR RH/TH RHR/THR		ASTM A276 316/316L STS				
	RMW/TMW		SA-240 316/316L STS				
to -325° F (-198° C)	RLC/TLC	ASTM A351 Gr. CF3M Cast 316/316L STS	ASTM A312 316/316L STS	ASTM A193 Gr. B8M Cl. 2 316 STS	ASTM A194 Gr. 8M 316 STS		
	RM/TM RMR/TMR RH/TH RHR/THR		ASTM A276 316/316L STS				
	RMW/TMW		SA-240 316/316L STS				
	RLC/TLC		ASTM A312 316/316L STS				

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Section 2000
 Application Report 2780.2
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For: LOW TEMPERATURE GAGECOCK MATERIAL SELECTION

GAGECOCKS

Temperature Range	Series	Suggested Materials					
		Body	Tailpipe(s)	Trim	Ball Retainer	Coupling Nut	Bonnet
to -20° F (-29° C)	100	ASTM A105	ASTM A108			ASTM A576 (12L14) Steel	ASTM A108 Gr. 1018 Carbon Steel
	200	Forged	Gr. 1018				
	300	Carbon Steel	Carbon Steel				
	400						
to -50° F (-46° C)	100	ASTM A350	ASTM A350	ASTM A276 316, 410 or 416 STS	ASTM A313 316 STS	ASTM A108 Gr. 1018 Austenitized Steel	ASTM A350 Gr. LF2 Cl. 1 Forged Carbon Steel
	200	Gr. LF2 Cl. 1	Gr. LF2 Cl. 1				
	300	Forged	Forged				
	400	Carbon Steel	Carbon Steel				
to -325° F (-198° C)	100	ASTM A351	ASTM A276			ASTM A276 316/316L STS	ASTM A276 316/316L STS
	200	Gr. CF3M	316/316L				
	300	Cast	STS				
	400	316/316L STS					

OS&Y GAGECOCKS

Temperature Range	Series	Suggested Materials				
		Body	Tailpipe	Trim	Coupling Nut	Yoke/Follower
to -20° F (-29° C)	500	ASTM A105	ASTM A108		ASTM A576 (12L14) Steel	ASTM A105 Forged Carbon Steel
	700	Forged Carbon Steel	Gr. 1018 Carbon Steel			
to -50° F (-46° C)	500	ASTM A350	ASTM A350	ASTM A276 316, 410 or 416 STS	ASTM A108 Gr. 1018 Austenitized Steel	ASTM A350 Gr. LF2 Cl. 1 Forged Carbon Steel
	700	Gr. LF2 Cl. 1 Forged Carbon Steel	Gr. LF2 Cl. 1 Forged Carbon Steel			
to -325° F (-198° C)	500	ASTM A351	ASTM A276		ASTM A276 316/316L STS	ASTM A351 Gr. CF3M Cast 316/316L STS
	700	Gr. CF3M Cast 316/316L STS	316/316L STS			