TABLE 2. LINER-BORE STRESSES AND INTERFERENCES FOR A 6-INCH BORE MULTI-RING CONTAINER WITH $K = 8.5$, $N = 5$, $k_1 = 2.0$, $k_n = 1.44$, $n \geq 2$, $\alpha_r = 0.5$, $\alpha_m = -0.5$[a]

	Stresses at Bore of Liner[b]								
	Residual Stresses at RT			Prestresses at Temperature			Operating Stress at Pressure and Temperature		
	σ_r/σ_1	σ_θ/σ_1	S/σ_1	σ_r/σ_1	σ_θ/σ_1	S/σ_1	σ_r/σ_1	σ_θ/σ_1	S/σ_1
RT Design	0	-1.000	-0.5000	0	-1.0000	-0.5000	-0.9727	0	0.4863
500 F Design	0	-1.1230	-0.5615	0	-1.0000	-0.5000	-0.9727	0	0.4863
1000 F Design	0	-1.2998	-0.6499	0	-1.0000	-0.5000	-0.9727	0	0.4863

	Dimensionless Interference Required as Manufactured [c]	
	Between Cylinders 1 and 2 for p = 300,000 psi[d], $E\Delta_1/r_1p$	Between Outer Cylinders n and n + 1 $E\Delta_n/r_np$
RT Design	0.358	0.343
500 F Design	0.454	0.343
1000 F Design	0.533	0.343

(a) The k_n, K, α_r, and α_m are defined by Equations (3), (4), and (13a, b), respectively. Material data are given in Table 1. The liner is 18% Ni steel and the outer cylinders are H-11 steel.

(b) σ_r is the radial stress, σ_θ the hoop stress, S the shear stress ($S \equiv (\sigma_\theta - \sigma_r)/2$), and σ_1 is the design strength – less than or equal to the ultimate tensile strength of the liner.

(c) E is the modulus of elasticity of the outer cylinders. Δ_n is interference in inches between cylinders n and n + 1. r_n is the outer radius of cylinder n.

(d) $E\Delta_1/r_1p$, at elevated temperatures, depends on p. $\sigma_1 = 310,000$ psi is required, ($p = 0.9727\ \sigma_1$).

TABLE 3. LINER-BORE STRESSES AND INTERFERENCES FOR A 6-INCH BORE MULTI-RING CONTAINER WITH $K = 8.5$, $N = 5$, $k_1 = 2.0$, $k_n = 1.44$, $n \geq 2$, $\alpha_r = 0.5$, $\alpha_m = -0.3$[(a)]

	Stresses at Bore of Liner[(b)]								
	Residual Stresses at RT			Prestresses at Temperature			Operating Stress at Pressure and Temperature		
	σ_r/σ_1	σ_θ/σ_1	S/σ_1	σ_r/σ_1	σ_θ/σ_1	S/σ_1	σ_r/σ_1	σ_θ/σ_1	S/σ_1
RT Design	0	-0.8000	-0.4000	0	-0.8000	-0.4000	-0.9727	0.2000	0.5863
500 F Design	0	-0.9054	-0.4527	0	-0.8000	-0.4000	-0.9727	0.2000	0.5863
1000 F Design	0	-1.0505	-0.5253	0	-0.8000	-0.4000	-0.9727	0.2000	0.5863

	Dimensionless Interference Required as Manufactured[(c)]	
	Between Cylinders 1 and 2 for $p = 300,000$ psi[(d)], $E\Delta_1/r_1p$	Between Outer Cylinders n and n + 1 $E\Delta_n/r_np$
RT Design	0.217	0.304
500 F Design	0.309	0.304
1000 F Design	0.383	0.304

(a) The k_n, K, α_r, and α_m are defined by Equations (3), (4), and (10a, b), respectively. Material data are given in Table 1. The liner is 18% Ni Steel and the outer cylinders are H-11 steel.

(b) σ_r is the radial stress, σ_θ the hoop stress, S the shear stress ($S \equiv (\sigma_\theta - \sigma_r)/2$), and σ_1 is the design strength – less than or equal to the ultimate tensile strength of the liner.

(c) E is the modulus of elasticity of the outer cylinder. Δ_n is interference in inches between cylinders n and n + 1. r_n is the outer radius of cylinder n.

(d) $E\Delta_1/r_1p$, at elevated temperatures, depends on p. $\sigma_1 = 310,000$ psi is required ($p = 0.9727\ \sigma_1$).