ERRATA SHEET FOR ANSI/ASHRAE STANDARD 103-2017
Methods of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers

April 25, 2019

The corrections listed in this errata sheet apply to ANSI/ASHRAE Standard 103-2017. The first printing is identified on the outside back cover as "Product code: 86316 7/17". Shaded items have been added since the previously published errata sheet dated January 7, 2019 was distributed.

Page	Erratum

31 **Table 8 Fuel Characteristics and Parameters for Calculating Steady-State Sensible Heat Loss ($L_{s,ss}$) and Steady-State Efficiency ($Effy_{ss}$).** The parenthesis "$)$" currently located between "$(\mathrm{CA(i)})$" and the square bracket "$]$" in the equation for *Ls,ss* should be moved after "$(\mathrm{CF(i)}$" as shown below.

TABLE 8 Fuel Characteristics and Parameters for Calculating Steady-State Sensible Heat Loss ($L_{S,SS}$) and Steady-State Efficiency ($Effy_{SS}$)

Move closing bracket

$$L_{S,SS} = \frac{100}{\mathrm{HHV}_A \times K_6} \sum_{i=1}^{5} \left\{ \left[\left(1 + \frac{A}{F} \right) \left(\mathrm{CF}(i) \right) + \left(\frac{A}{F} \right) (R_{T,a} - 1)(\mathrm{CA}(i)) \right] \times \langle [(T_{a,SS,X} + T_{abs}) \times K_7]^i - [(T_{RA} + T_{abs}) \times K_7]^i \rangle \right\}$$

The corrected equation *Ls,ss* is shown below.

$$L_{S,SS} = \frac{100}{HHV_A \times K_6} \sum_{i=1}^{5} \left\{ \left[\left(1 + \frac{A}{F} \right) (CF(i)) + \left(\frac{A}{F} \right) (R_{T,a} - 1)(CA(i)) \right] \times \left\langle \left[(T_{a,SS,X} + T_{abs}) \times K_7 \right]^i - \left[(T_{RA} + T_{abs}) \times K_7 \right]^i \right\rangle \right\}$$

42 **11.3.11.1 Latent Heat Gain under Part-Load Conditions.** In the equation for L_G change "h_g" to "h_{fg}".

44 **11.4.8.3 Average Outdoor Temperature.** In the two equations for $T_{OA,H}$ in Section 11.4.8.3 delete the square bracket "[" from each of the equations identified below in red text.

$$T_{OA,H}\,(T_C \text{ in } °\mathrm{F}) = 6.86 \times 10^{-7}\,(T_C)^4 - 1.96 \times 10^{-4}\,(T_C)^3 + [1.08 \times 10^{-2}\,(T_C)^2 + 5.50 \times 10^{-1}\,(T_C) + 2.33$$

Or for temperature in °C use the following:

$$T_{OA,H}\,(T_C \text{ in } °\mathrm{C}) = 4.00 \times 10^{-6}\,(T_C)^4 - 3.51 \times 10^{-4}\,(\mathrm{T_C})^3 - [6.84 \times 10^{-3}\,(T_C)^2 + 7.29 \times 10^{-1}\,(T_C) - 3.73$$

69-75 **Figures E-9 through E-15.** Replace Figures E-9 through E-15 on pages 69 through 75 with the corrected figures shown on the attached pages.

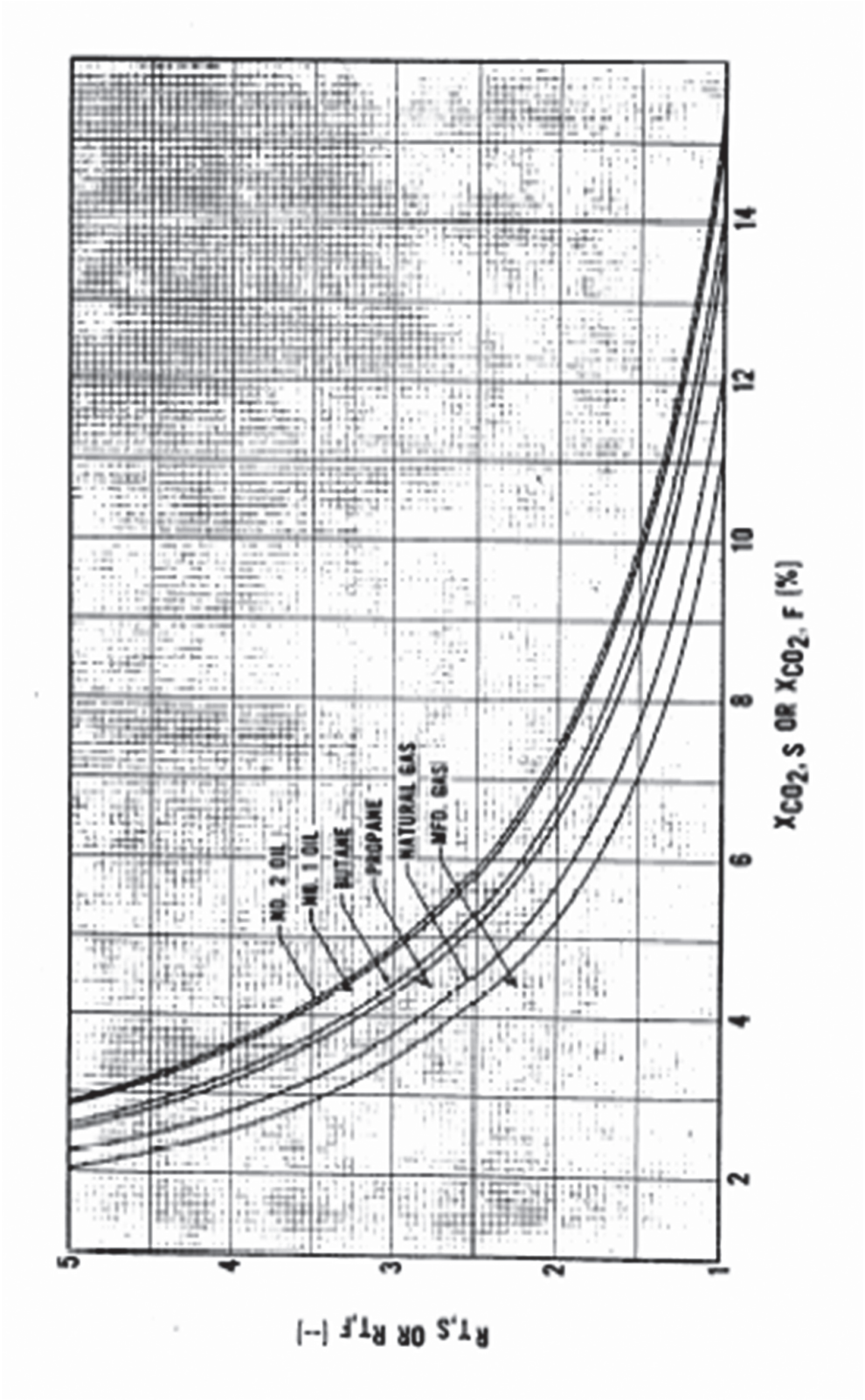

FIGURE E-9 Ratio of total combustion to stoichiometric air versus carbon dioxide (CO_2) concentration.

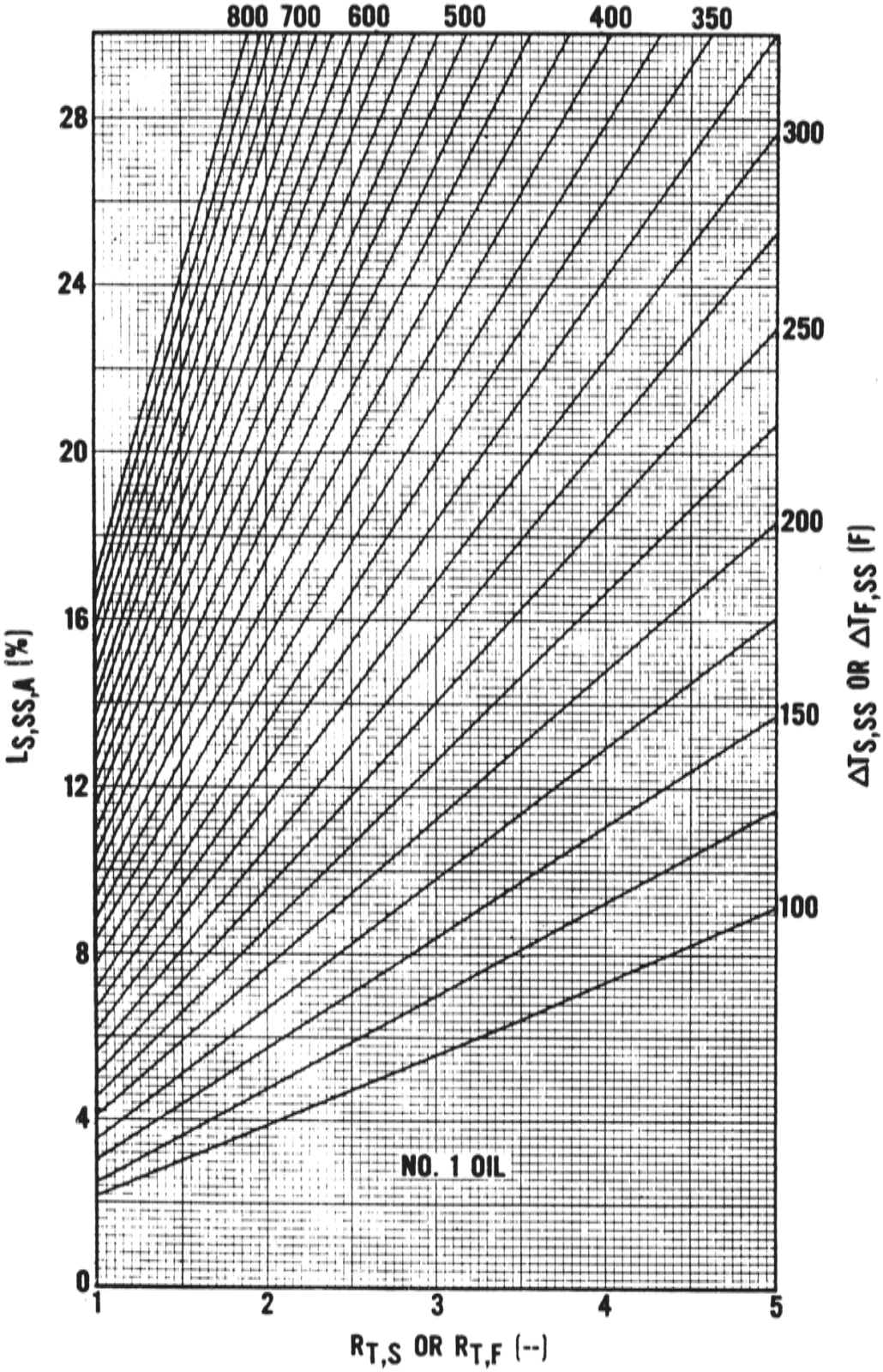

FIGURE E-10 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for No. 1 oil).

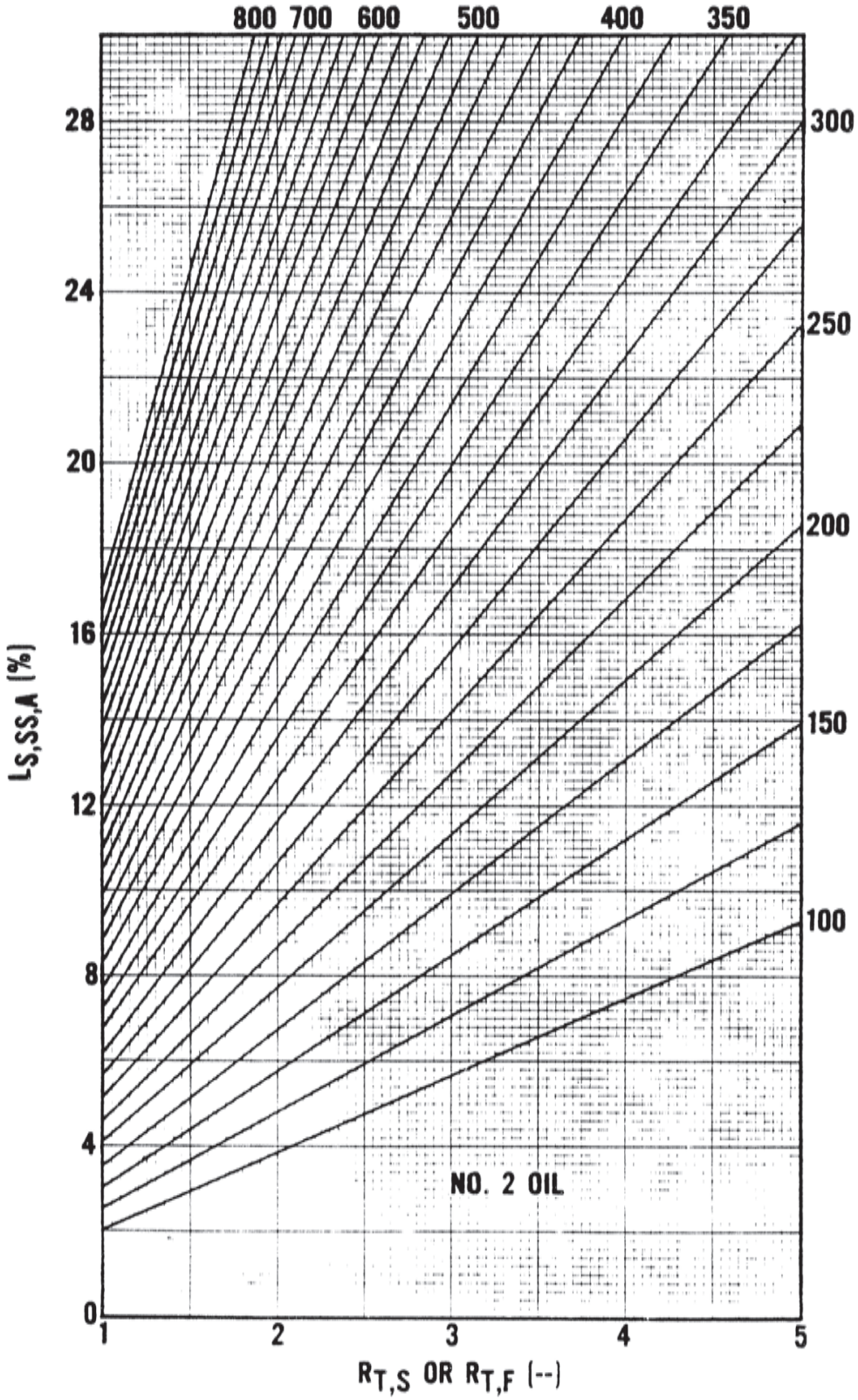

FIGURE E-11 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for No. 2 oil).

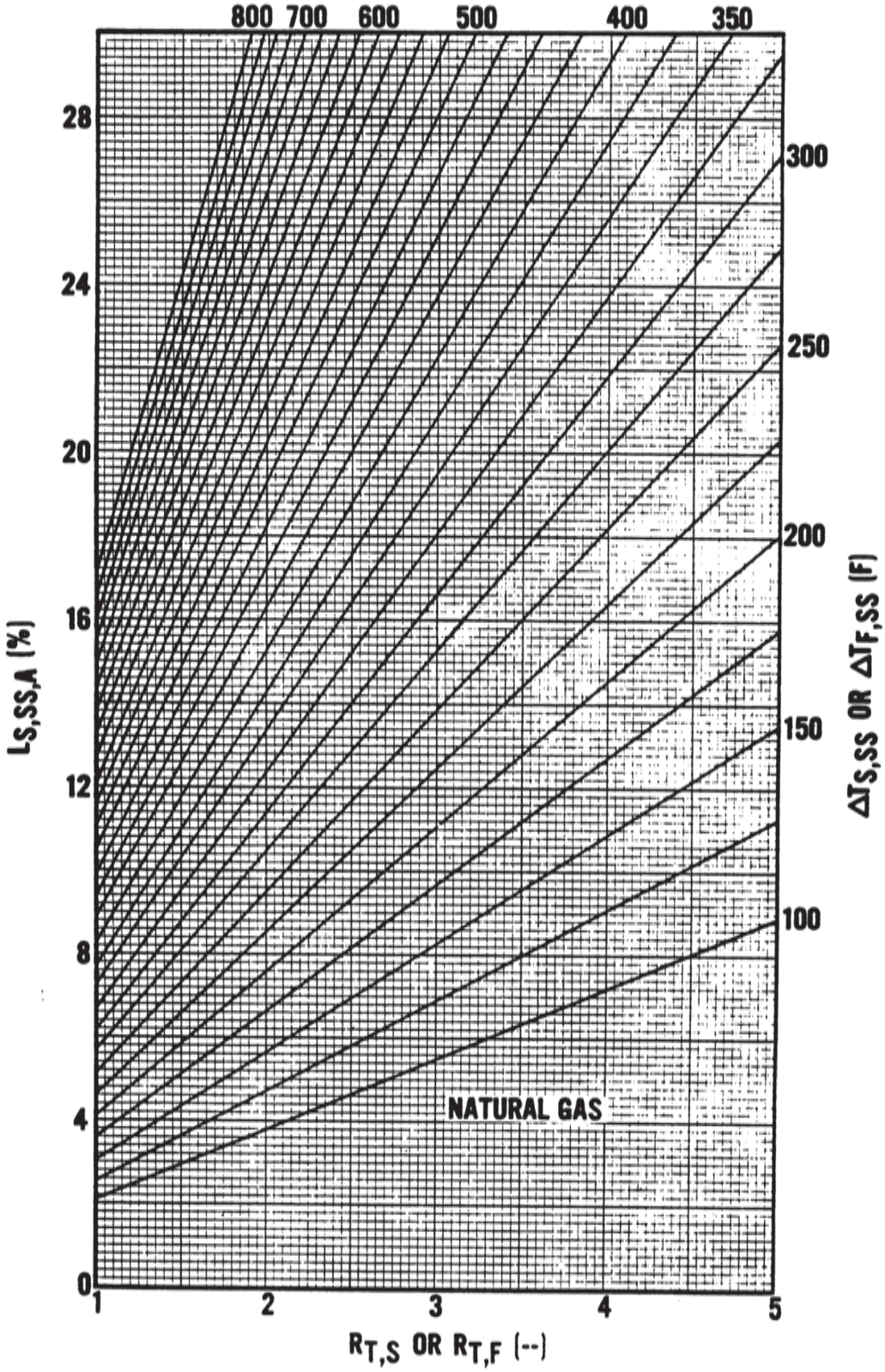

FIGURE E-12 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for natural gas).

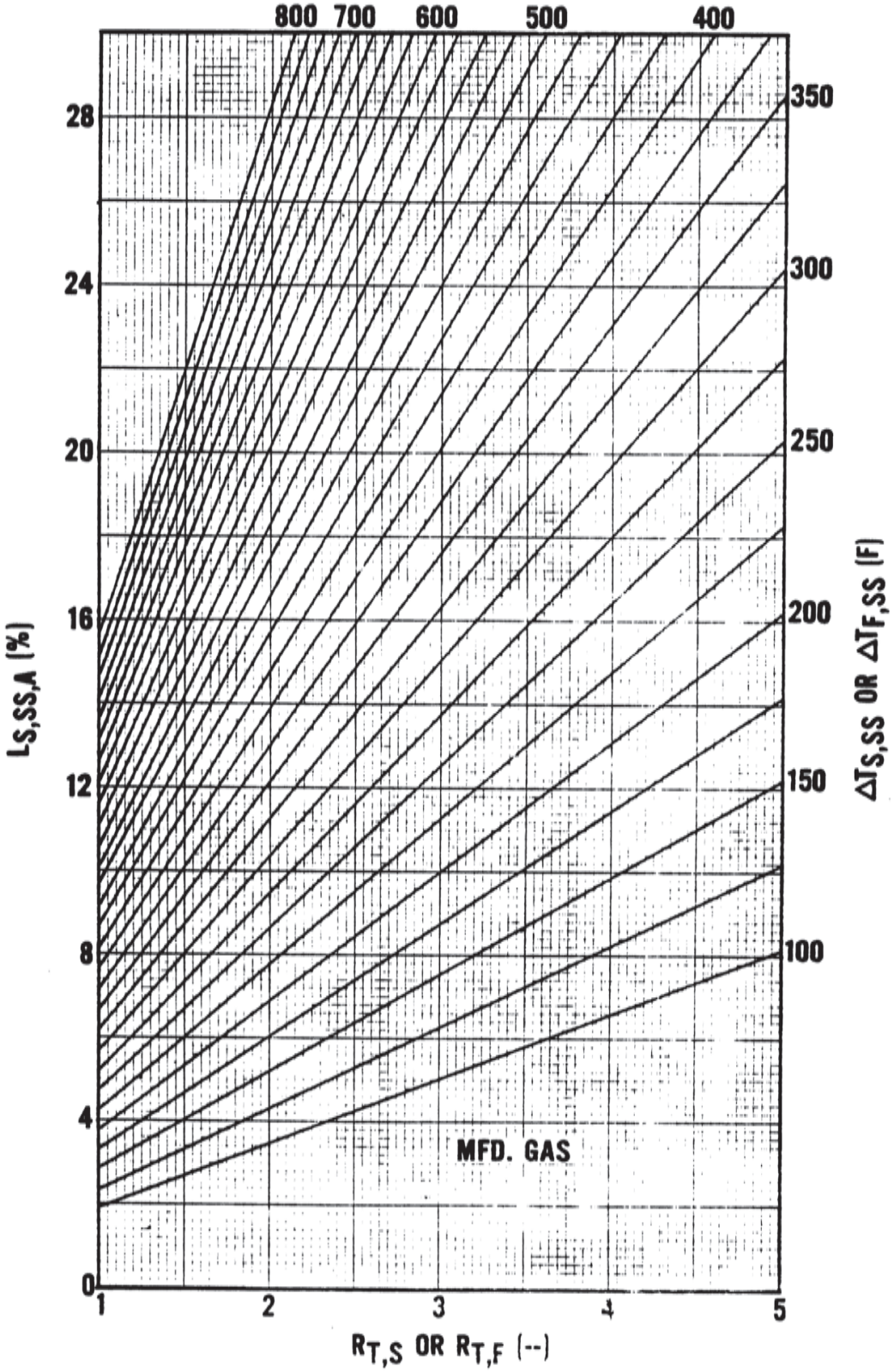

FIGURE E-13 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for manufactured gas).

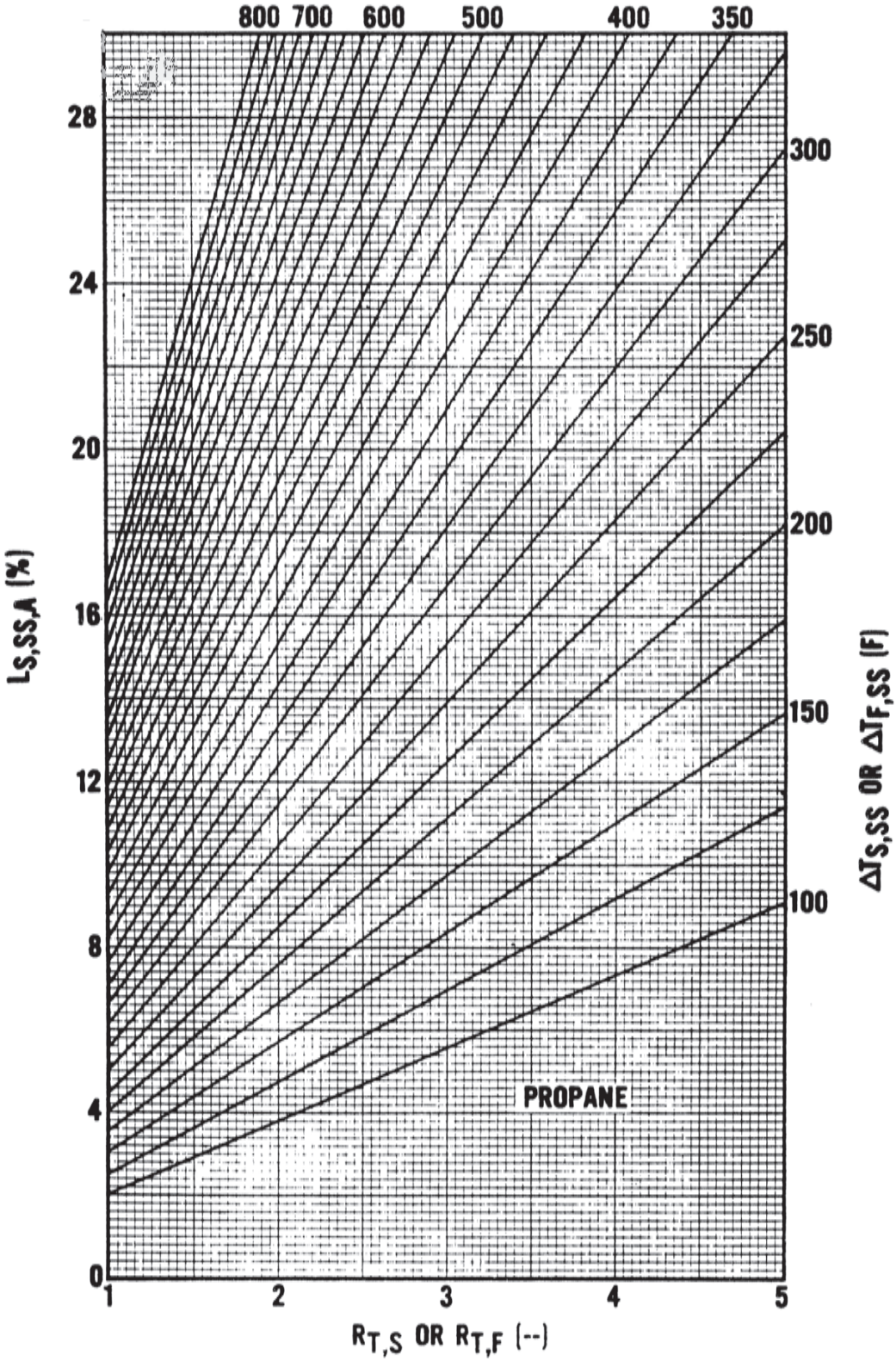

FIGURE E-14 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for propane).

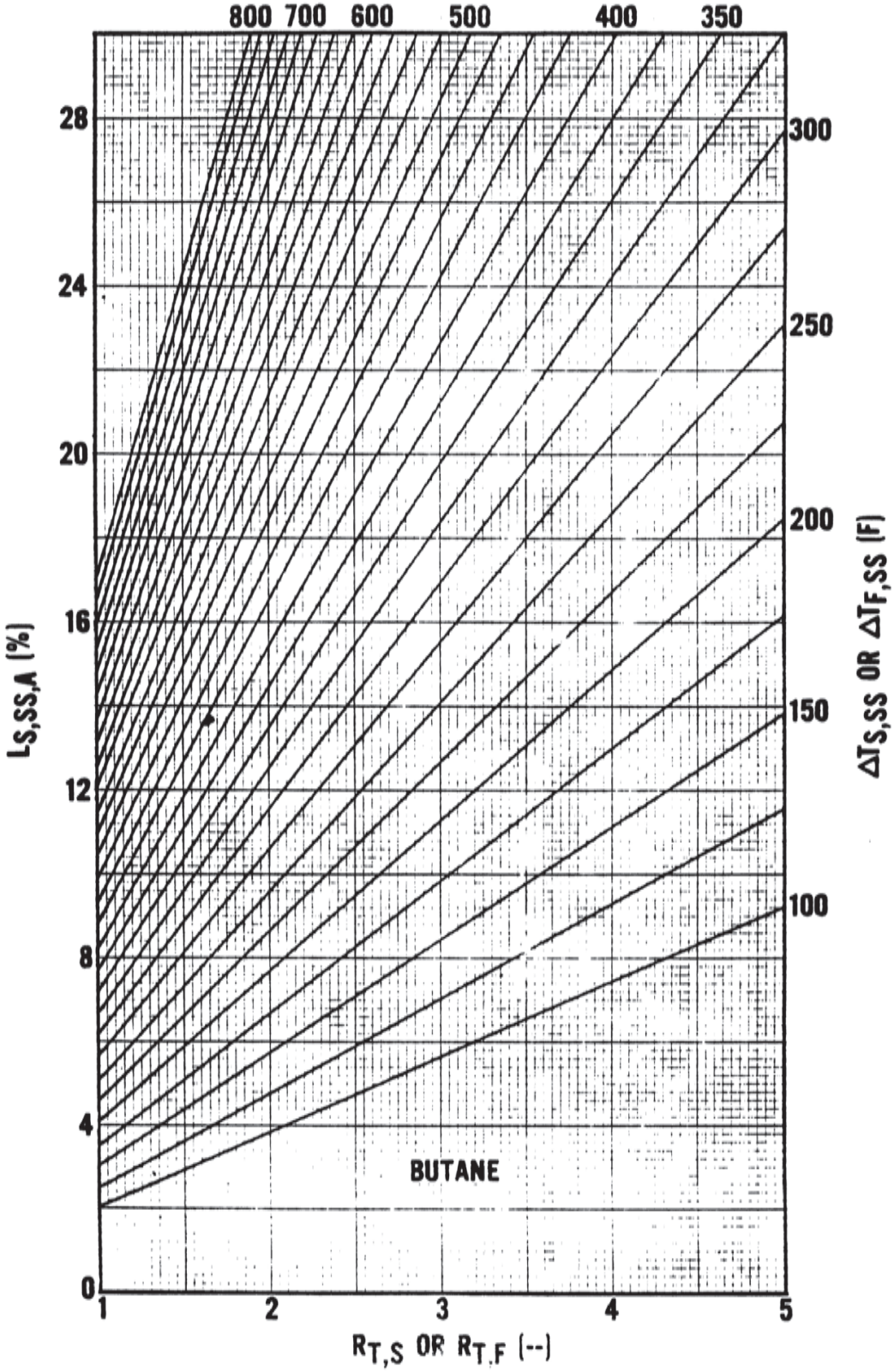

Figure E-15 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for butane).