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

August 26, 2025

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 May 10, 2022 was distributed.

Page	Erratum
17	**8.4.1.1 Gas Burner.** Add Section 8.4.1.1.1 and renumber the existing Section 8.4.1.1.1 as 8.4.1.1.2 as shown below. *(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)* **8.4.1.1.1 Modulating Gas Burner Adjustment at Maximum Input Rate.** For gas-fired furnaces and boilers equipped with modulating-type controls, adjust the controls to operate the unit at the maximum fuel input rate. Set the control to the maximum setting. Start the furnace or boiler by turning the safety control valve to the ON position. **8.4.1.1.2 ~~8.4.1.1.1~~ Modulating Gas Burner Adjustment at Reduced Input Rate. […]**
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

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

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

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

39	**11.2.10.6 Off-Cycle Sensible Heat Loss.** In Section 11.2.10.6 the nomenclature for $M_{F,P}$ should be replaced as follows: $M_{F,P}$ = rate of flue gas mass flow during the off-period during the post-purge after the burner is shut off as defined in Section 11.6.3
40	**11.2.10.8 OFF-Cycle Infiltration Heat Loss.** In Section 11.2.10.8 for systems numbered 2, 3, and 4 for cases where t_p is intended to be less than or equal to 3

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minutes, the equation for $L_{I,OFF1}$ should be:

$$L_{I,OFF1} = 100 * C_p * M_{F,P} * t_P * \left(T_{F,SS} + T_{abs}\right) * \left[\frac{1}{t_{ON}\frac{Q_{IN}}{60}}\right] * \left[\frac{T_{IA} - T_{OA}}{C_{TS}(T_{F,SS} - T_{F,OFF}(t_P))}\right] * ln\left[\frac{T_{RA} + T_{abs} + C_{TS}(T_{F,SS} - T_{RA})}{T_{RA} + T_{abs} + C_{TS}(T_{F,OFF}(t_P) - T_{RA})}\right]$$

The nomenclature for $M_{F,P}$ should be replaced as follows:

$M_{F,P}$ = rate of flue gas mass flow during the off-period during the post-purge after the burner is shut off as defined in Section 11.6.3

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.

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

Or for temperature in °C use the following:

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

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.

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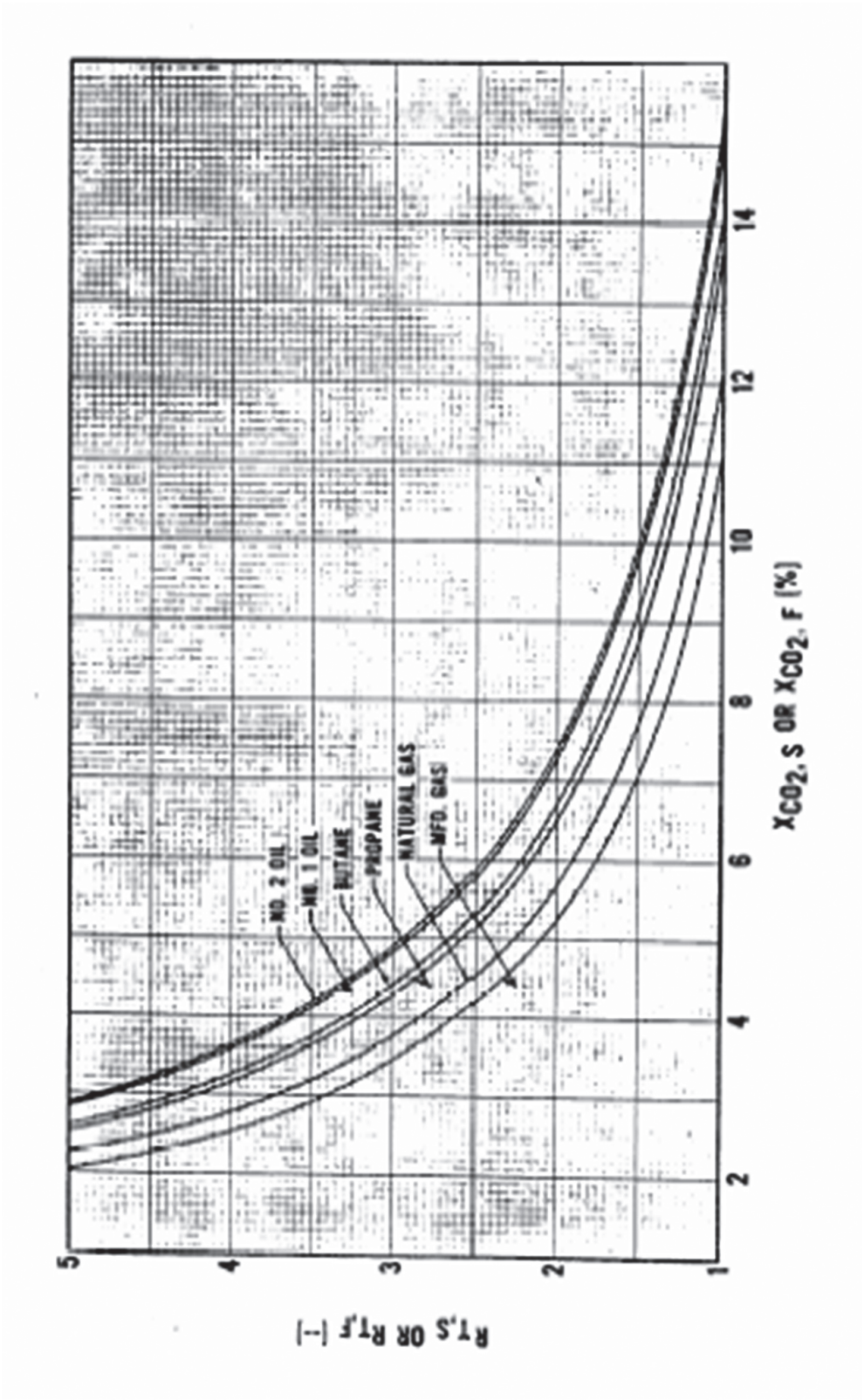

FIGURE E-9 Ratio of total combustion to stoichiometric air versus carbon dioxide (CO_2) concentration.

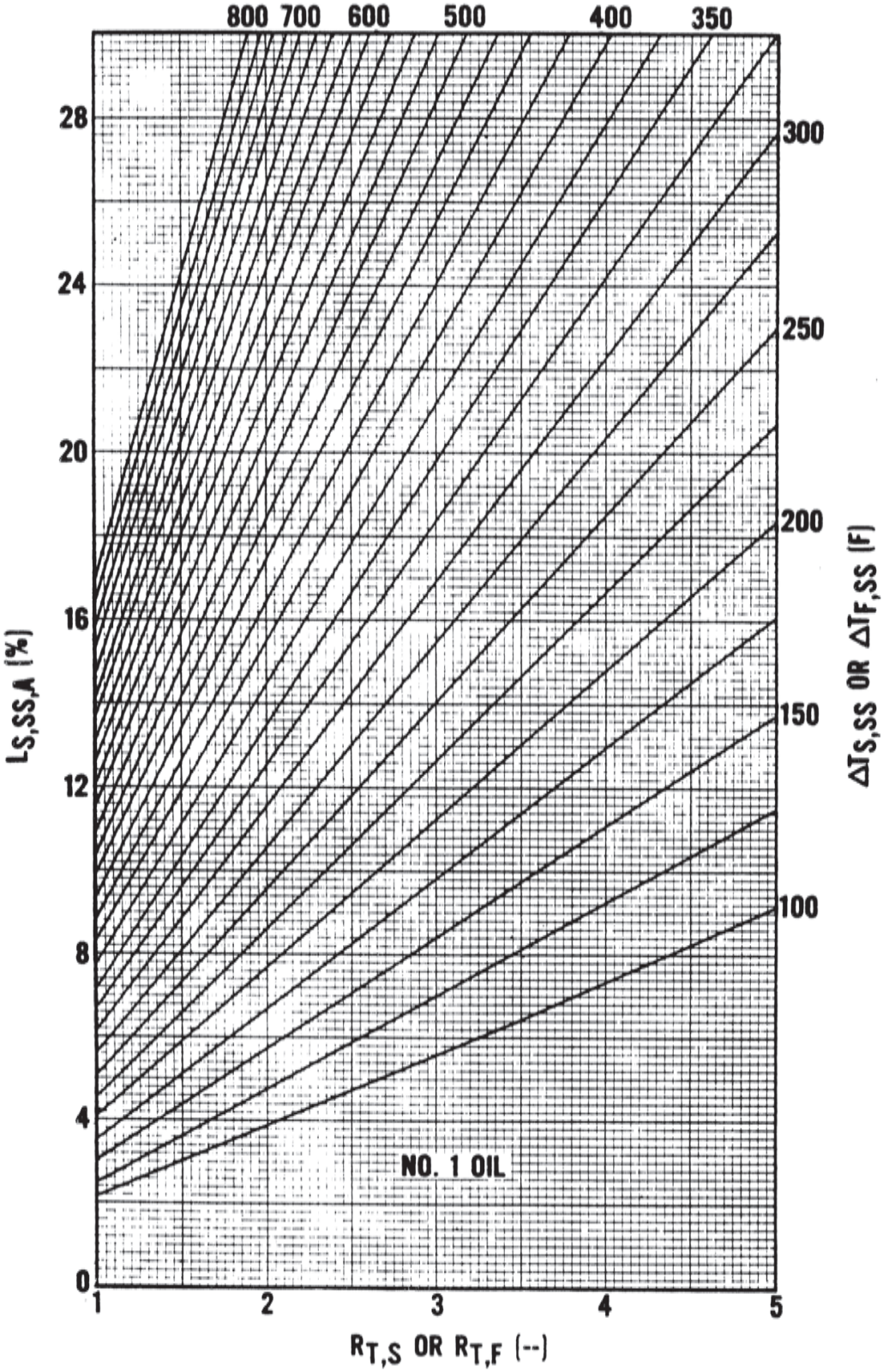

FIGURE E-10 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for No. 1 oil).

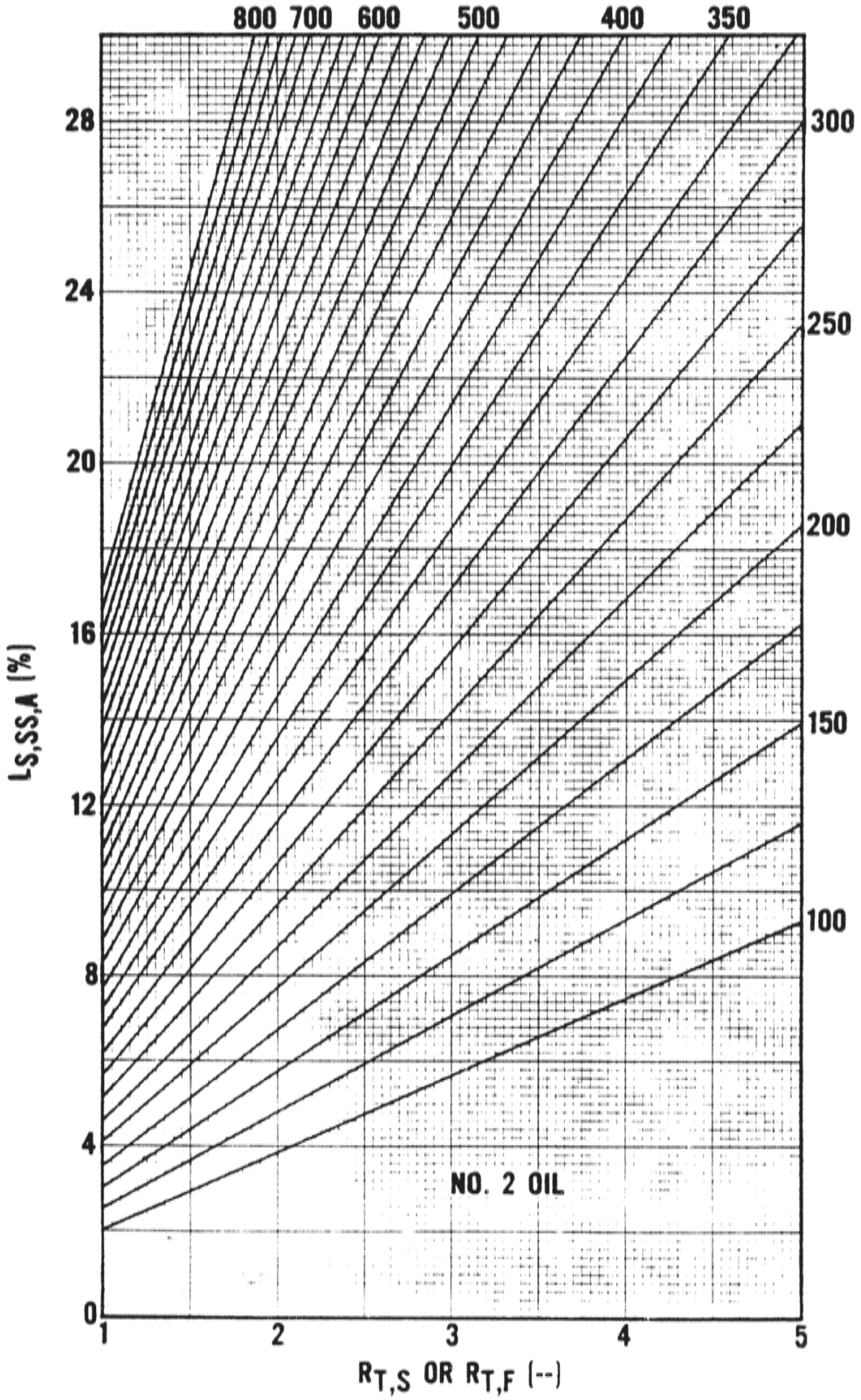

FIGURE E-11 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for No. 2 oil).

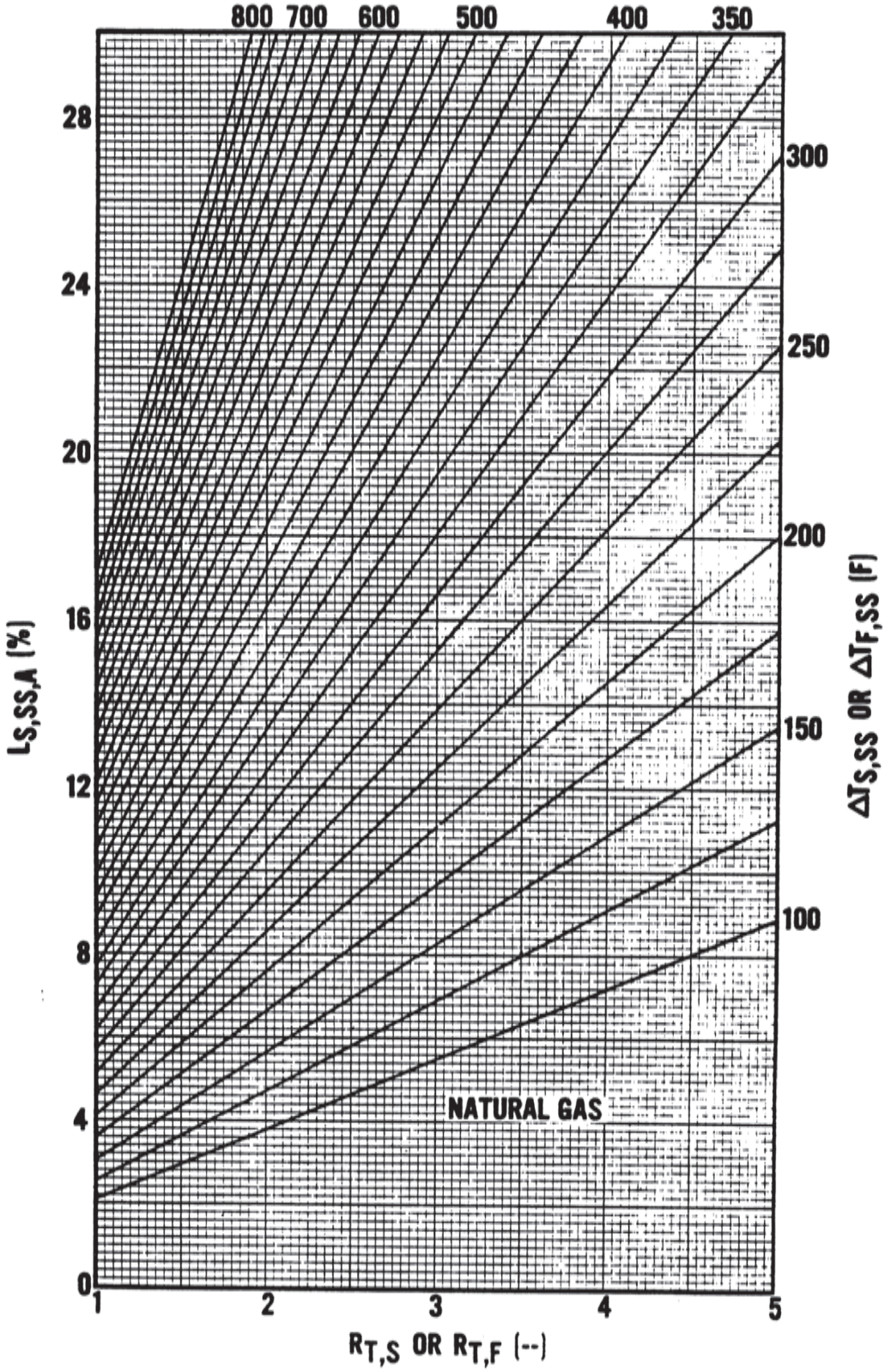

FIGURE E-12 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for natural gas).

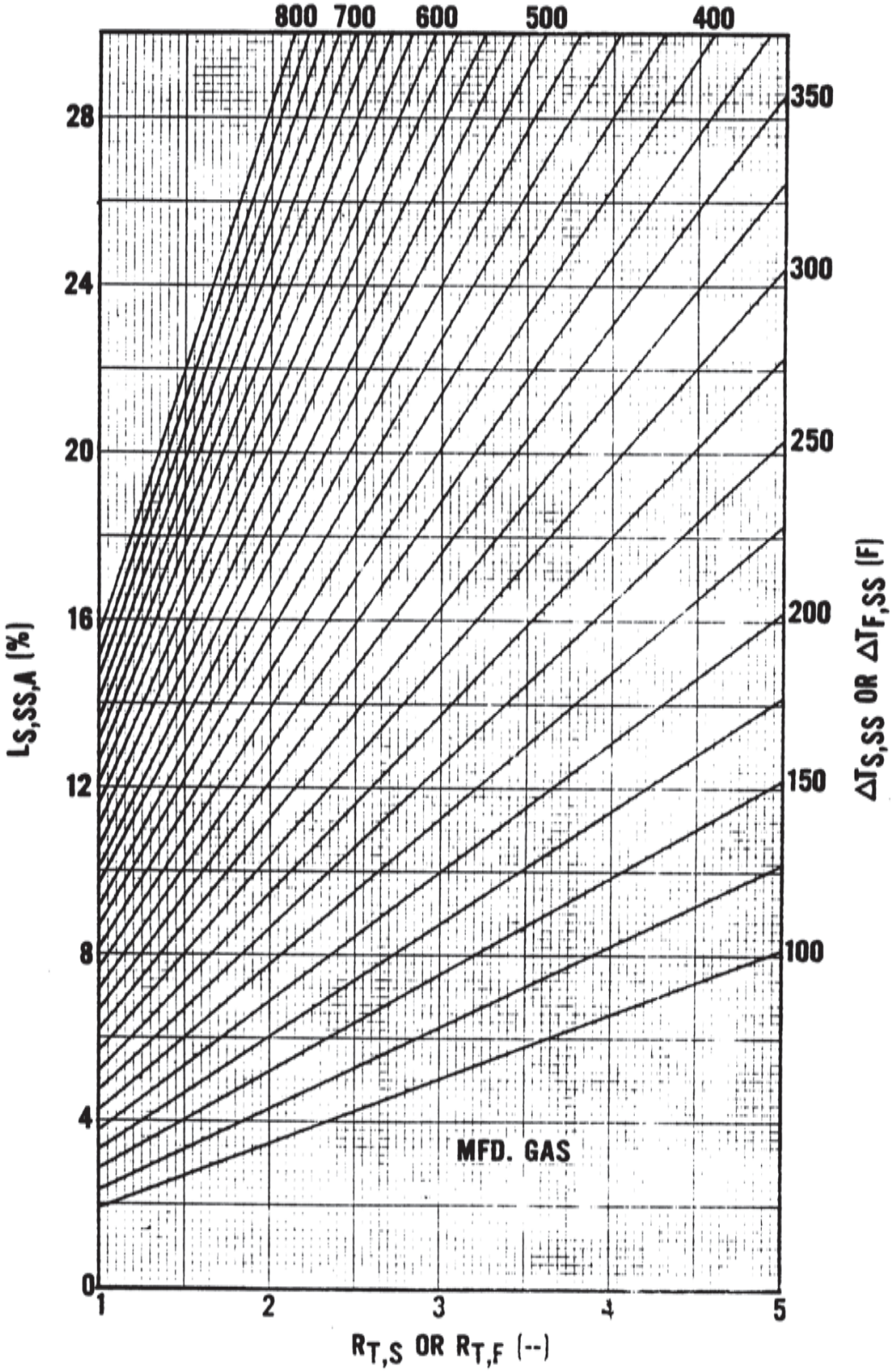

FIGURE E-13 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for manufactured gas).

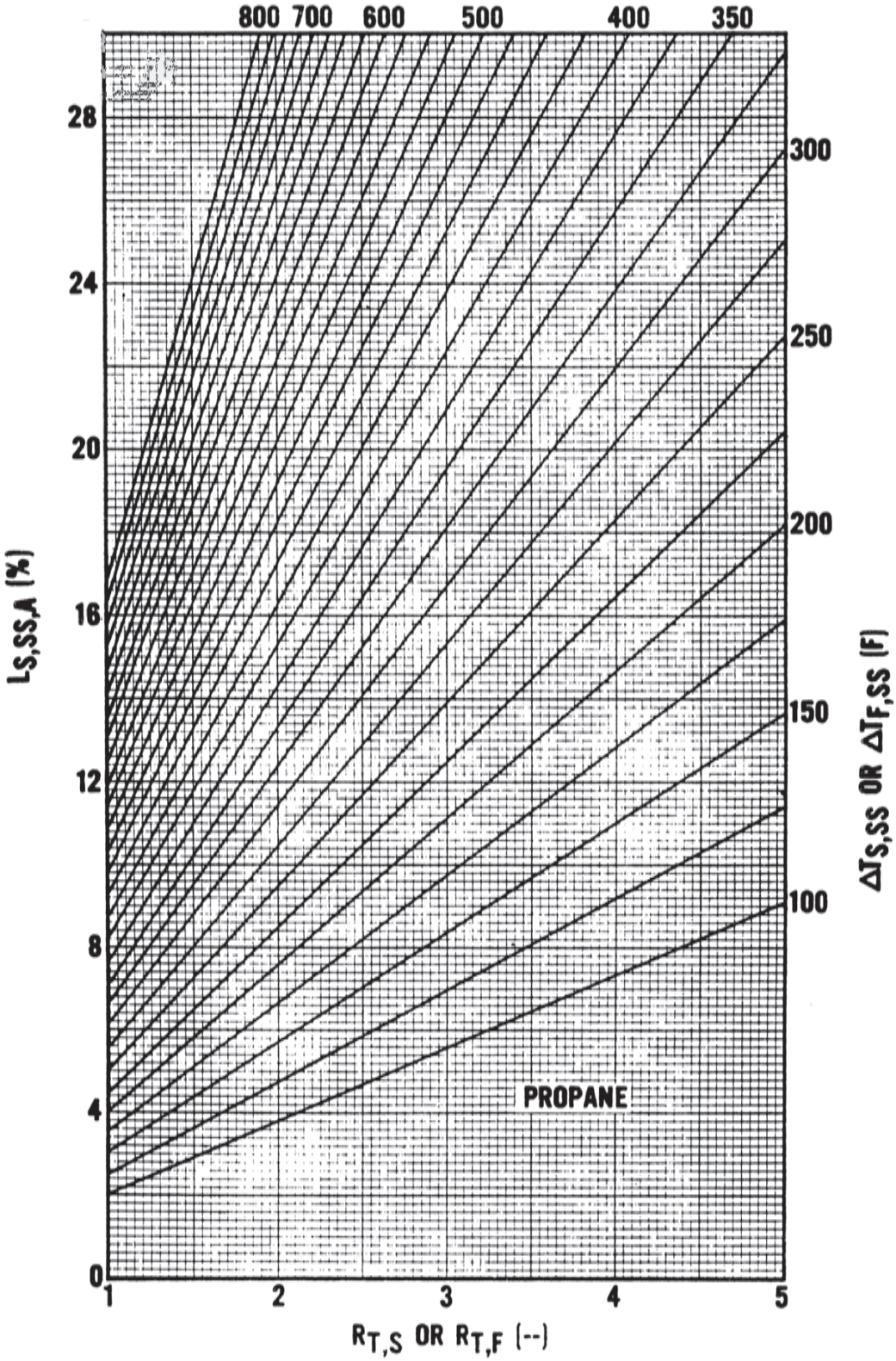

FIGURE E-14 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for propane).

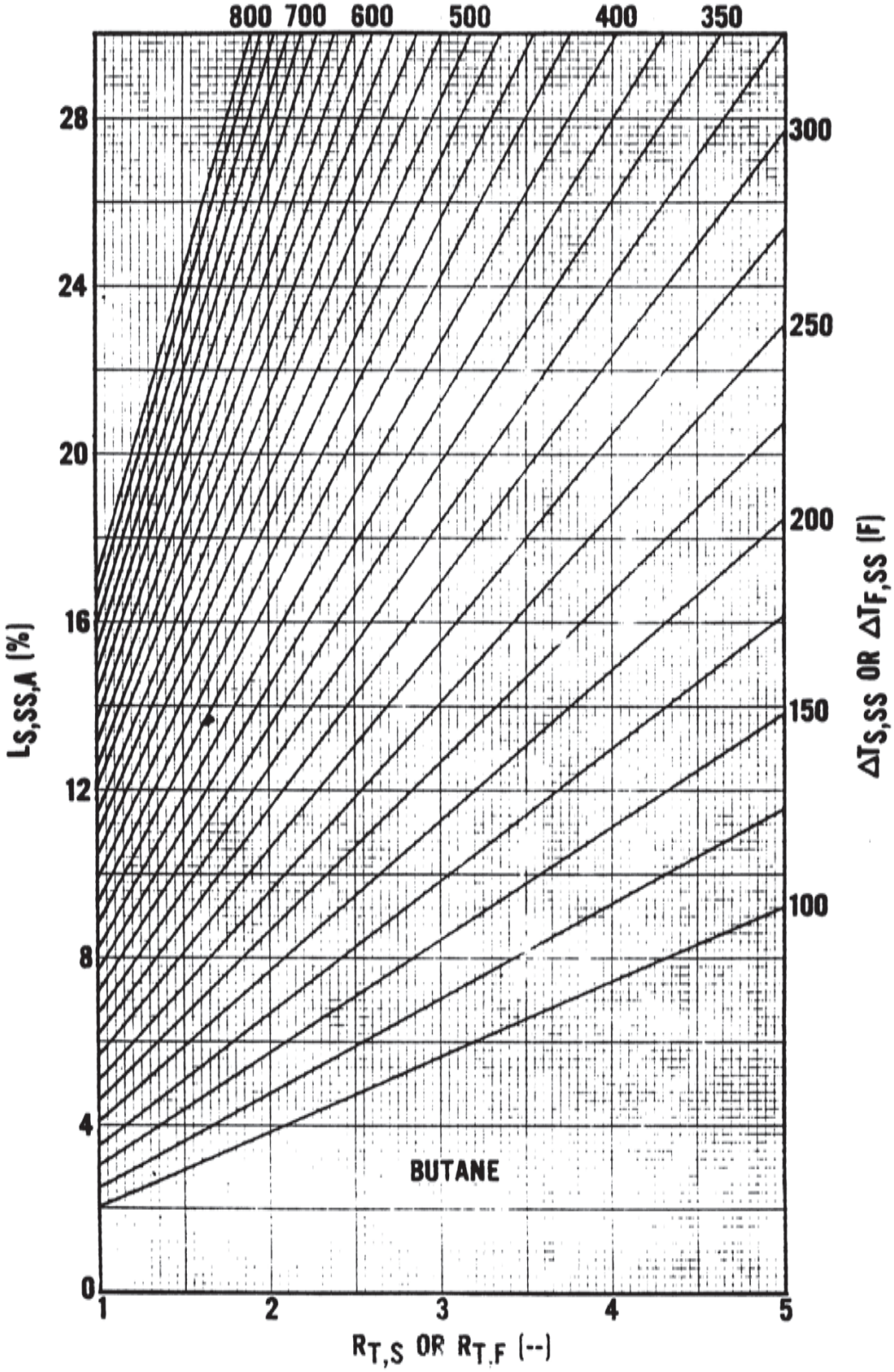

Figure E-15 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for butane).