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

May 10, 2022

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 April 25, 2019 was distributed.

<u>**Page**</u>   <u>**Erratum**</u>

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 "$(CA(i))$" and the square bracket "$]$" in the equation for Ls,ss should be moved after "$(CF(i)$" 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

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

The corrected equation Ls,ss is shown below.

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

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.

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

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.
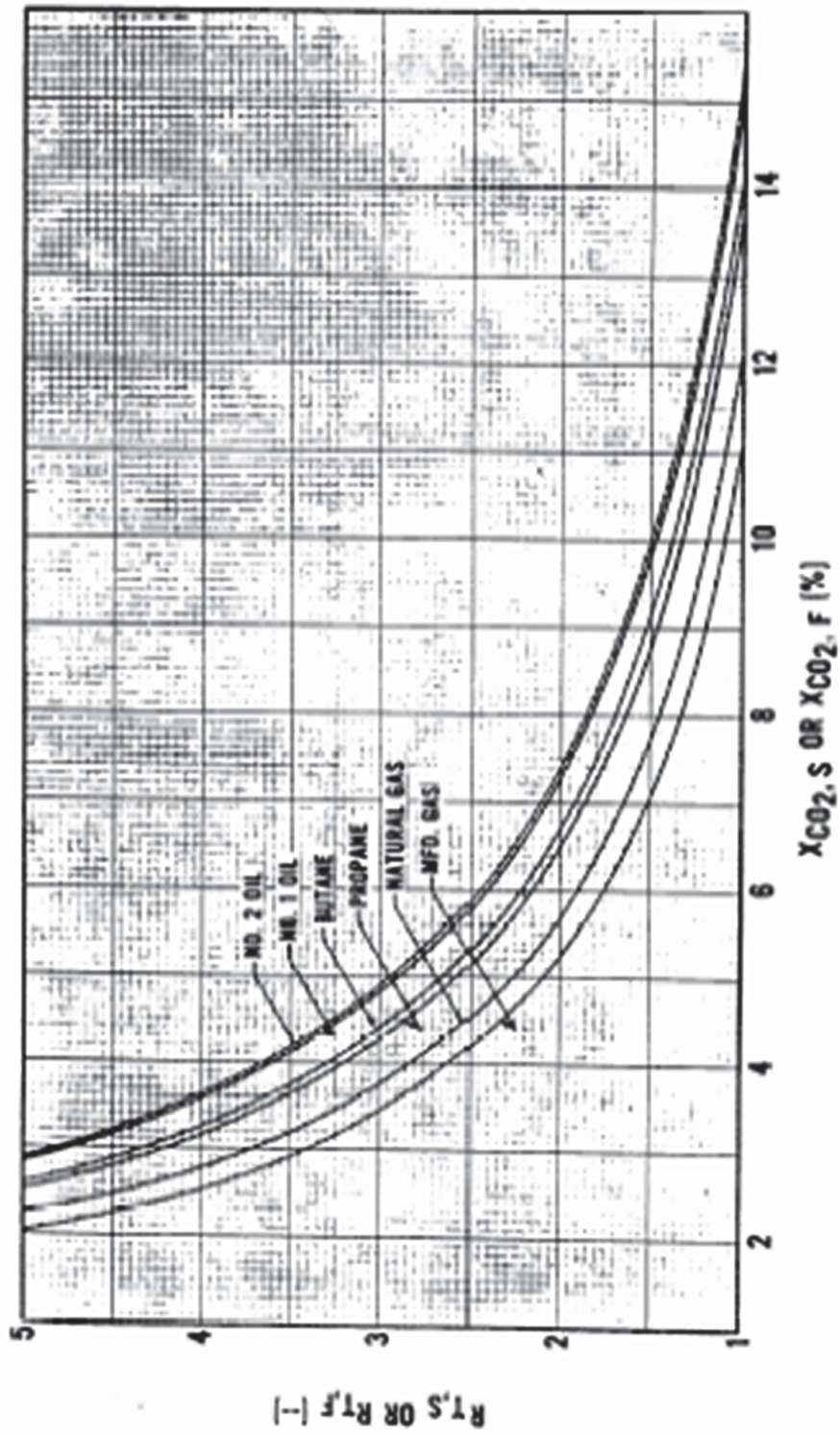
FIGURE E-9 Ratio of total combustion to stoichiometric air versus carbon dioxide (CO_2) concentration.
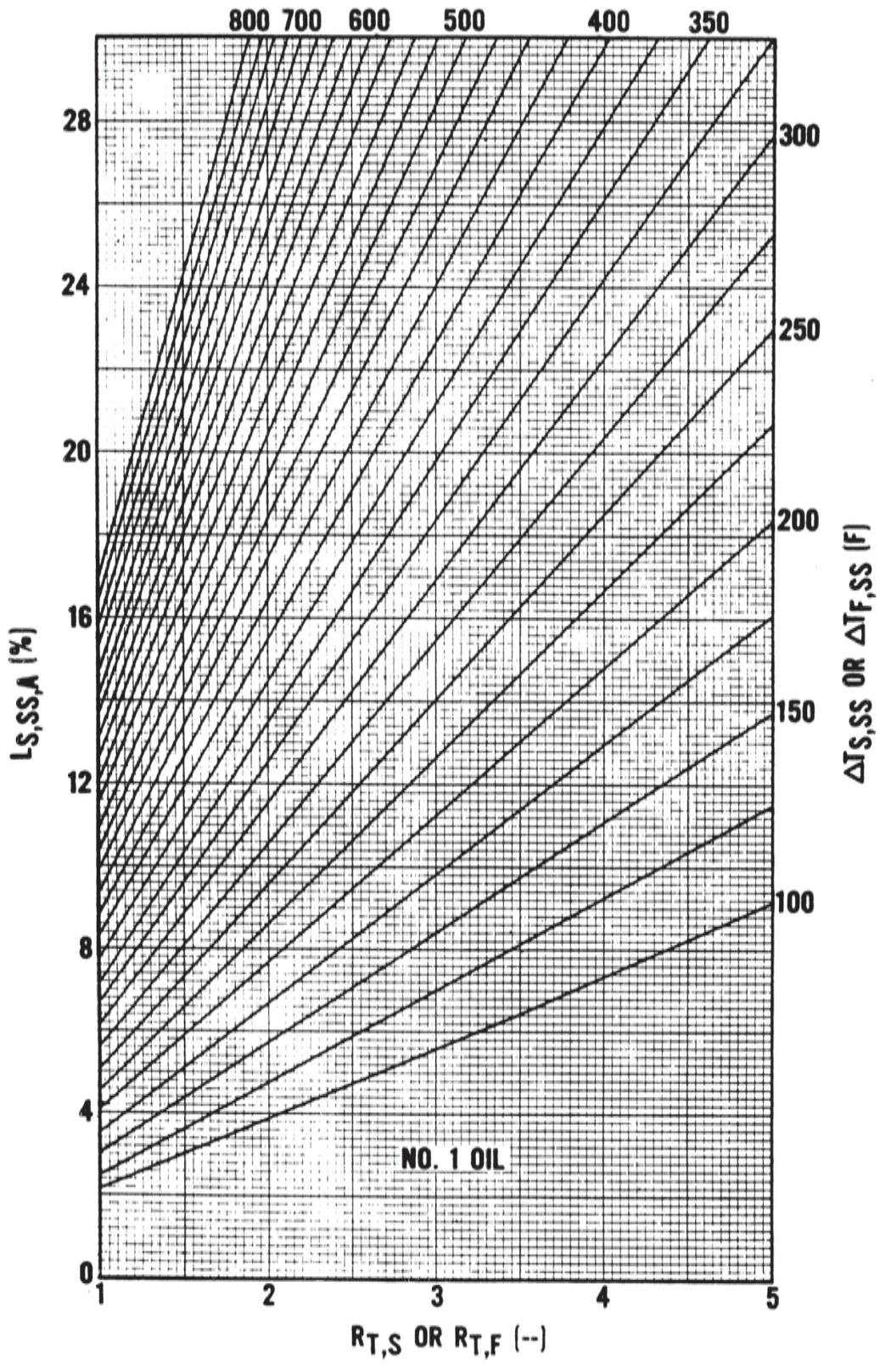
FIGURE E-10 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for No. 1 oil).
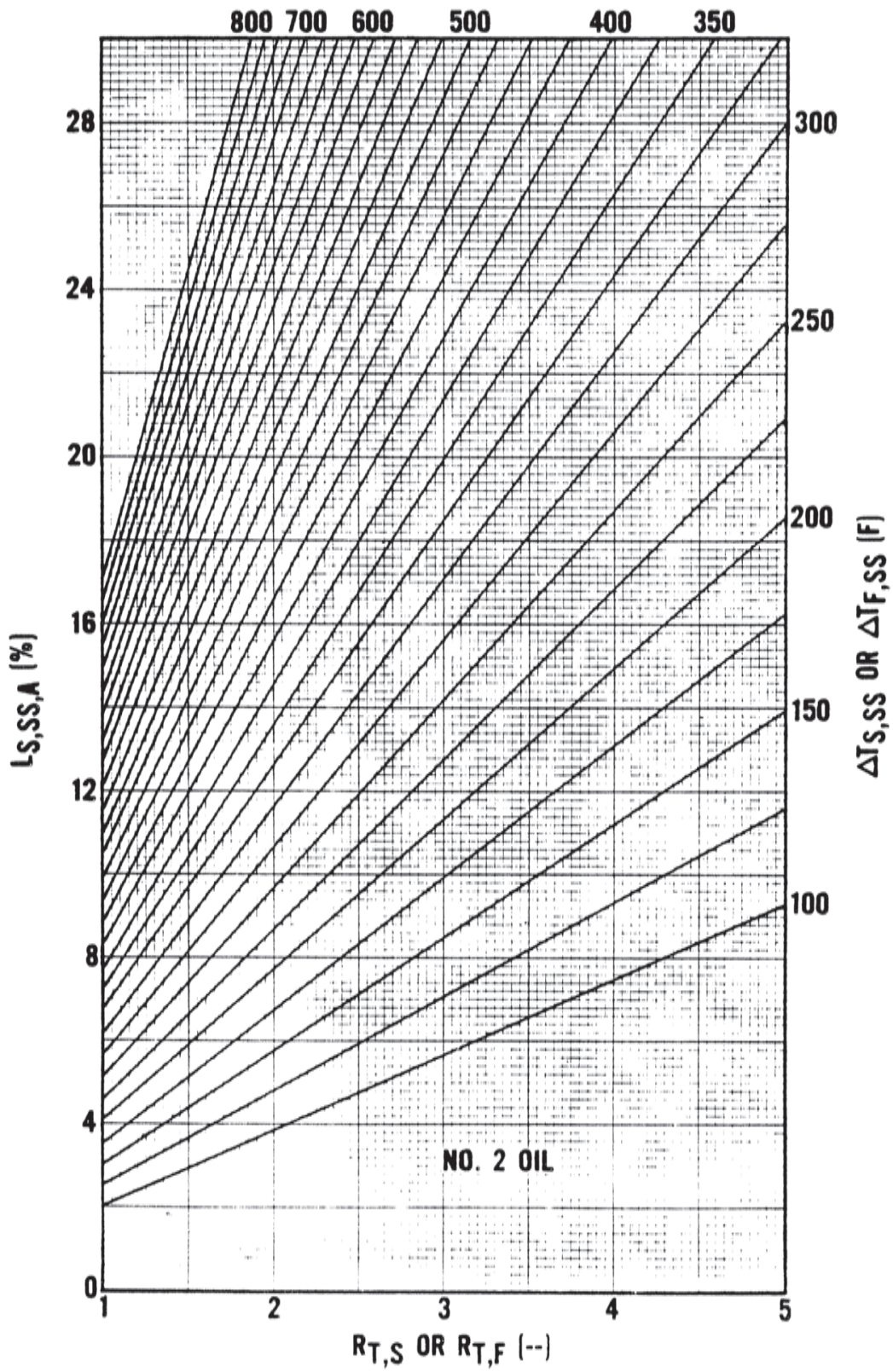
FIGURE E-11 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for No. 2 oil).
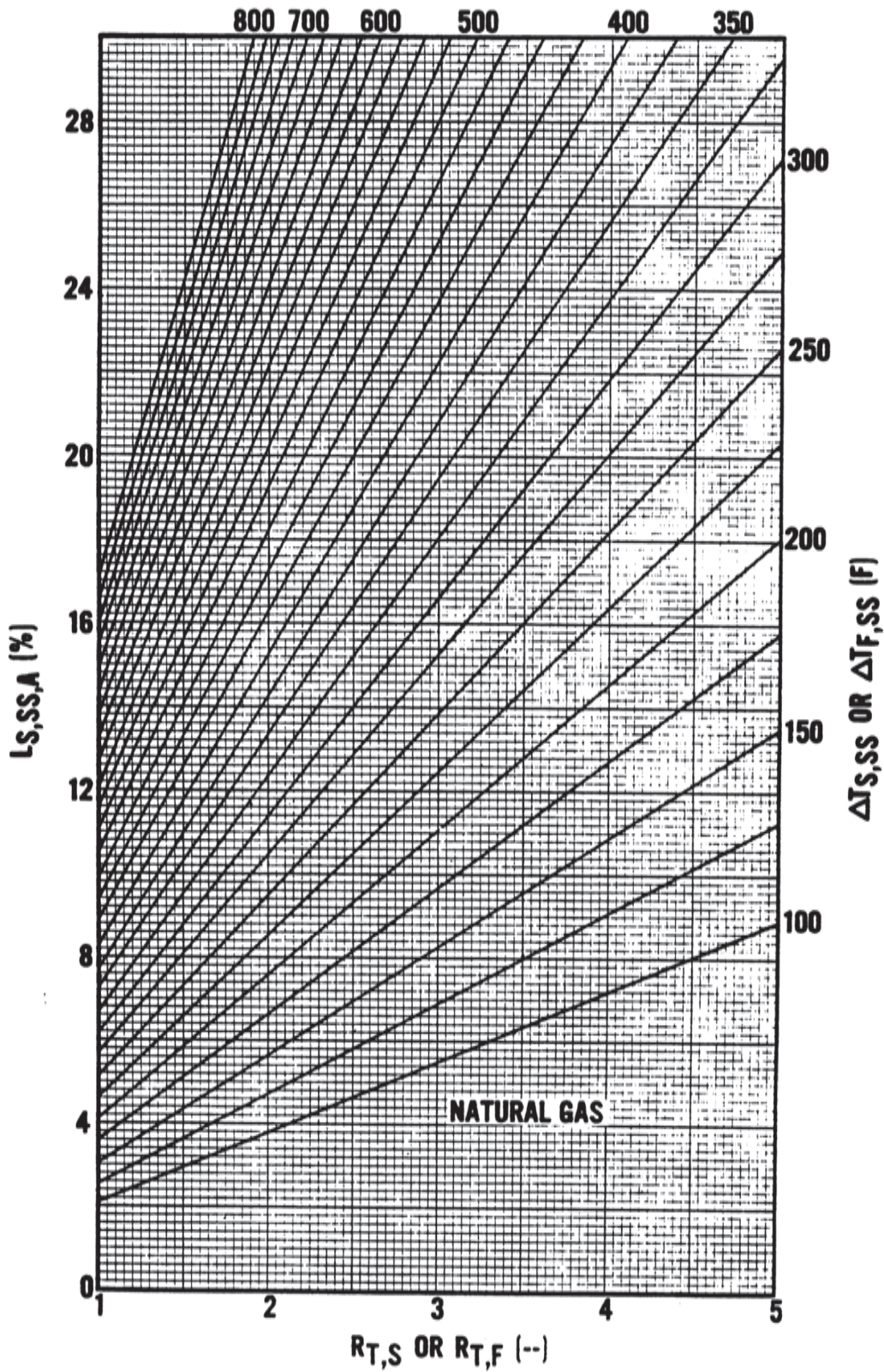
FIGURE E-12 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for natural gas).
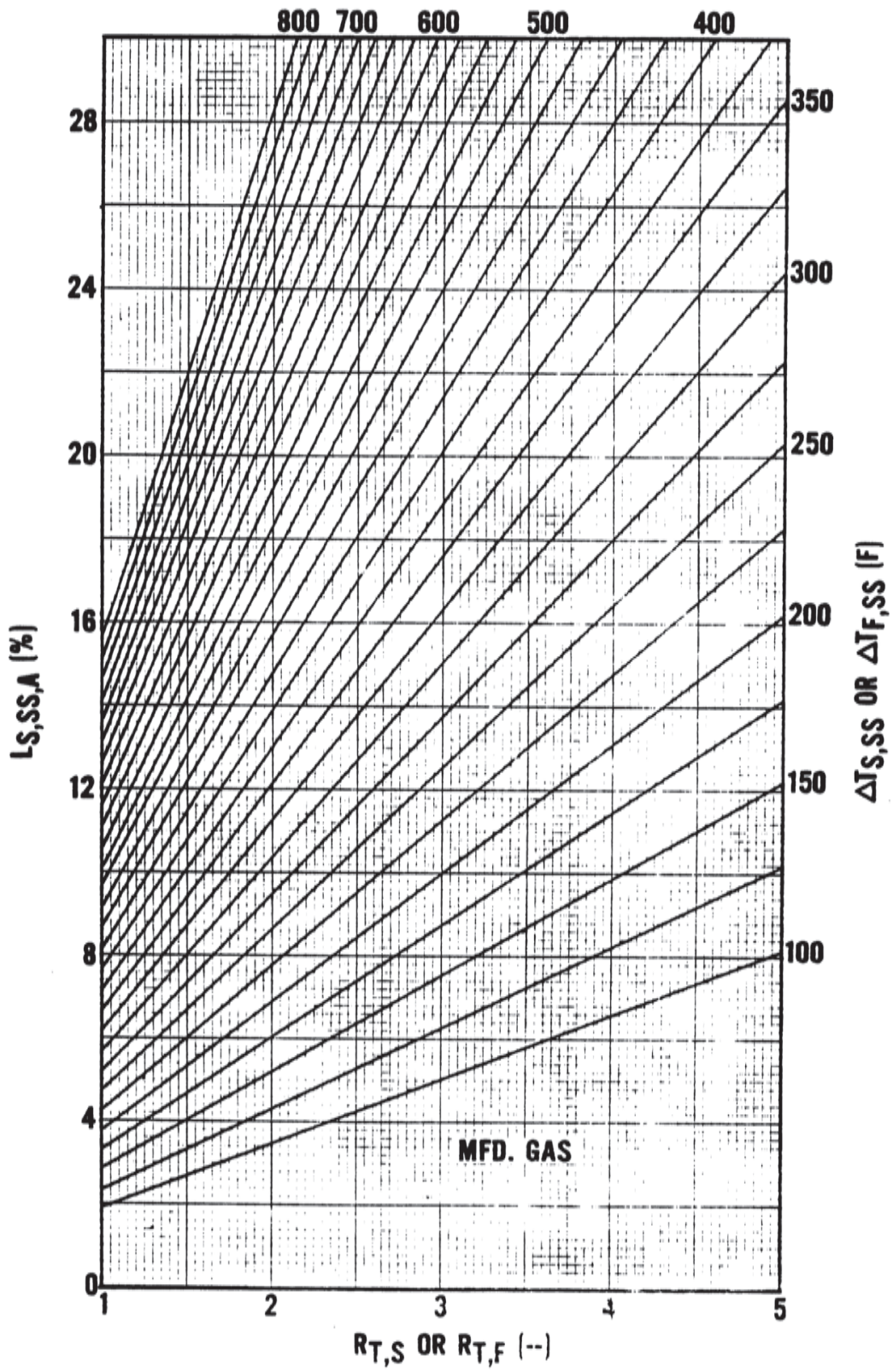
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FIGURE E-13 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for manufactured gas).

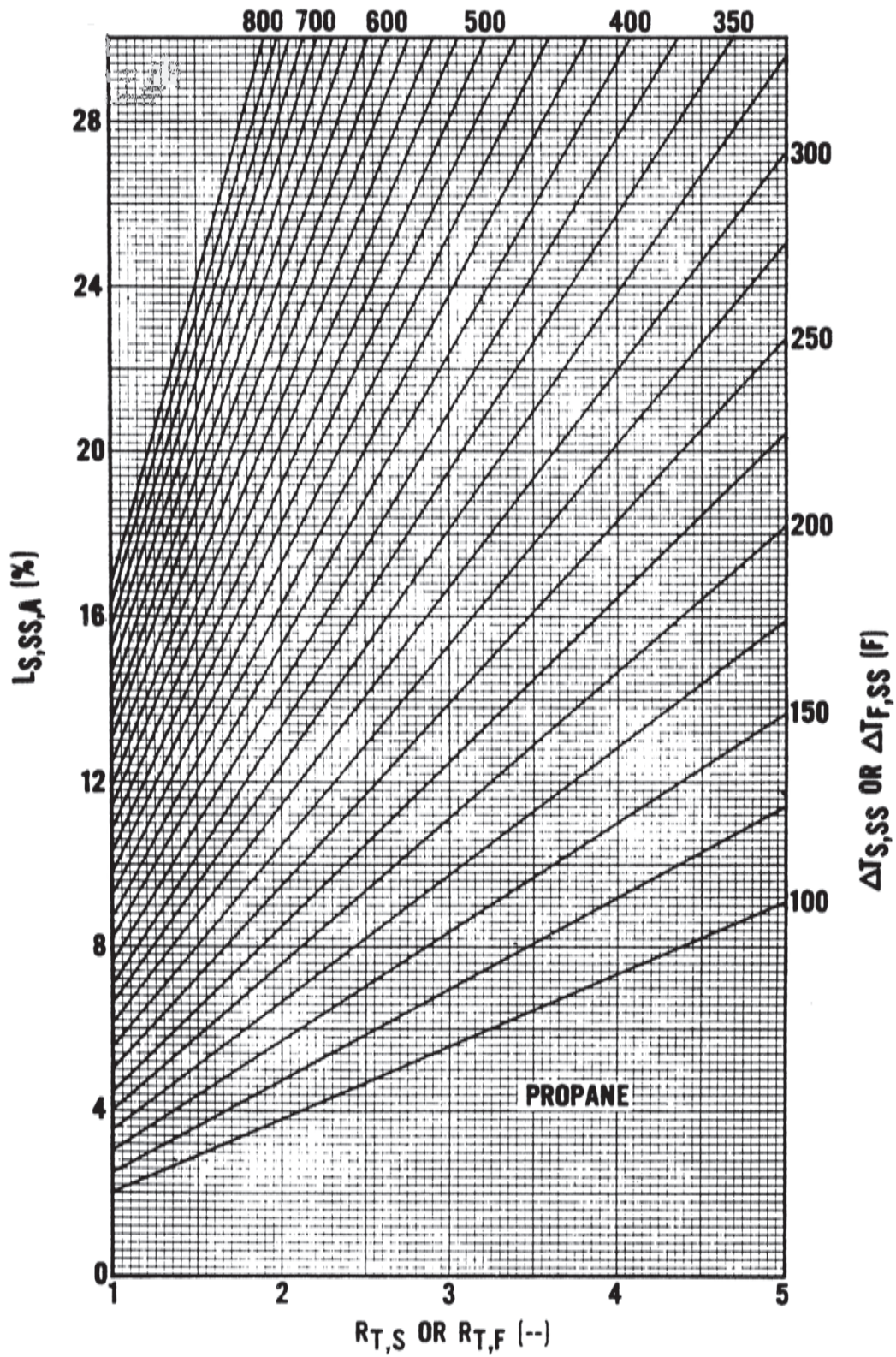**FIGURE E-14 Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for propane).**
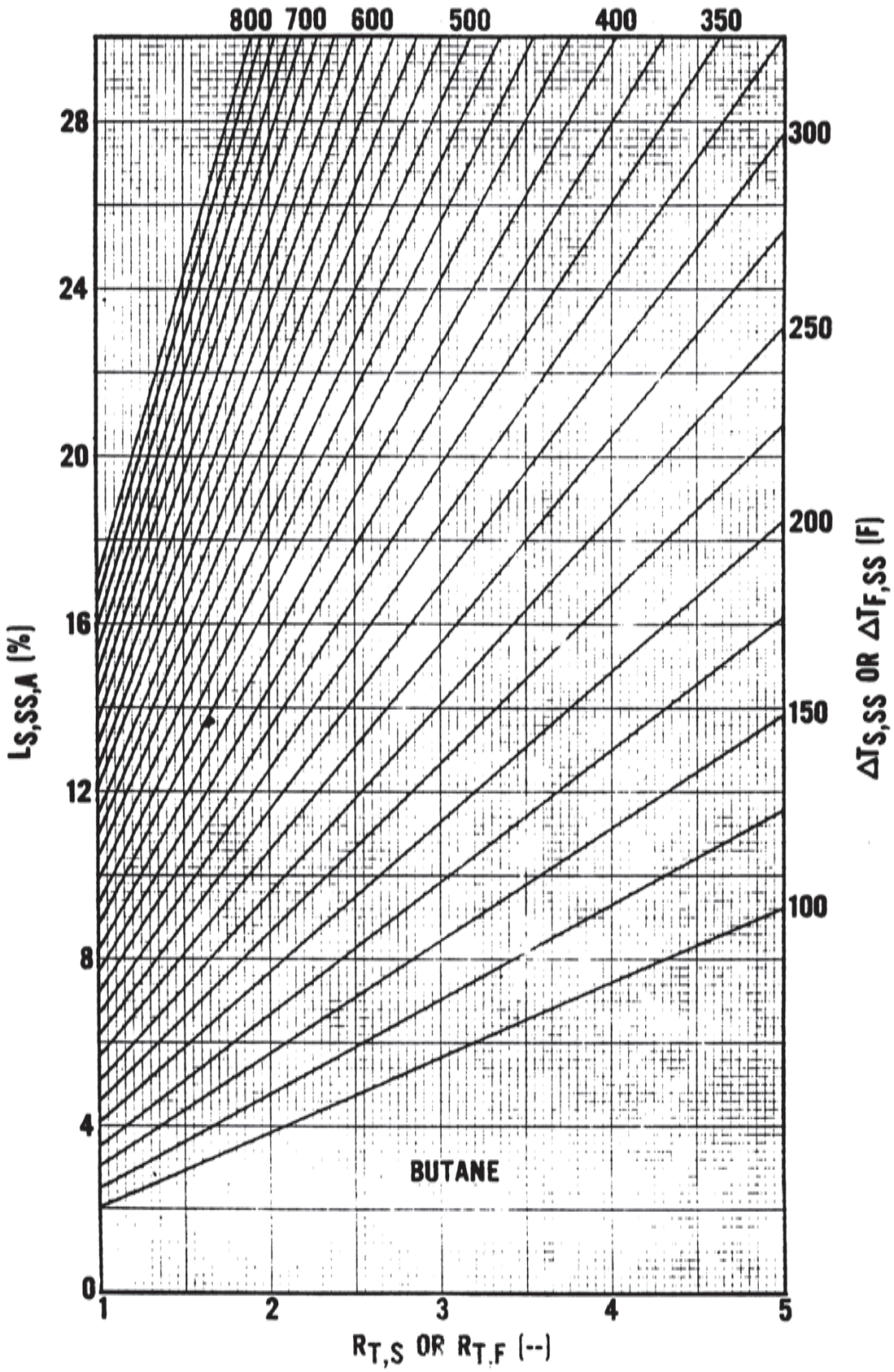
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Figure E-15   Steady-state sensible heat loss versus ratio of total combustion to stoichiometric air (for butane).