

TABLE 6.22 (NEW)
TIER 2A, 2B and 3B METHODS – estimates of relative uncertainties (%) for $\gamma_{i,p}$ and $\gamma_{k,i,p}$
(semiconductor and MEMS manufacturing under certain conditions), 95 percent confidence intervals

Tier, input gas ($\gamma_{i,p}$) vs. byproduct ($\gamma_{k,i,p}$), and wafer size	CF₄ (IPC or ITC)/ EWC	C₂F₆ IPC/ EWC	c-C₄F₈ IPC/ EWC	NF₃ (IPC or ITC)/ EWC	SF₆ IPC/ EWC	NF₃ RPC/ EWC	CF₄ RPC/ EWC	C₃F₈ RPC/ EWC	N₂O TFD/ other
Tier 2a*									
$\gamma_{i,p}$	240†	260	200	180†	340				
$\gamma_{CF4,i,p}$	NA	>260	>200	>180	>340				
$\gamma_{C2F6,i,p}$	NA	NA	NA	NA	>340				
Tier 2b									
$\gamma_{i,p}$ (≤ 200 mm wafer size)	240†	260	200	180†	340				
$\gamma_{CF4,i,p}$ (≤ 200 mm wafer size)	NA	>260	>200	>180	>340				
$\gamma_{C2F6,i,p}$ (≤ 200 mm wafer size)	NA	NA	NA	NA	>340				
$\gamma_{i,p}$ (300 mm wafer size)	NM	NM	NM	280†	NM				
$\gamma_{CF4,i,p}$ (300 mm wafer size)	NA	NA	NA	>280	NA				
Tier 3b									
$\gamma_{i,p}$ (both ≤ 200 mm and 300 mm wafer size)	240†	260	200	180†	340	320	NM	NM	400
$\gamma_{CF4,i,p}$ (both ≤ 200 mm and 300 mm wafer size)	NA	>260	>200	>180	>340	>320	NA	NA	NA
$\gamma_{C2F6,i,p}$ (both ≤ 200 mm and 300 mm wafer size)	NA	NA	NA	NA	>340	NA	NA	NA	NA
$\gamma_{i,p}$ (≤ 200 mm wafer size)	240†	260	200	180†	340	160	NM	NM	160
$\gamma_{CF4,i,p}$ (≤ 200 mm wafer size)	NA	>260	>200	>180	>340	>160	NM	NA	NA
$\gamma_{C2F6,i,p}$ (≤ 200 mm wafer size)	NA	NA	NA	NA	>340	NA	NA	NA	NA
$\gamma_{i,p}$ (300 mm wafer size)	NM	NM	NM	280†	NM	320	NM	NM	400
$\gamma_{CF4,i,p}$ (300 mm wafer size)	NA	NA	NA	>280	NA	>320	NA	NA	NA

Source: Survey of industrial facility data conducted by the authors of Chapter 6.

*The uncertainties for the Tier 2a gamma weighting factors are estimated using the higher of the uncertainties for the gamma factors for 200- and 300-mm wafer manufacturing for that input gas and process type combination.

† The gamma values for (IPC or ITC)/EWC for 200 mm, and their corresponding uncertainties, were developed based on IPC only, and the values (and corresponding uncertainties) for 300 mm were developed based on the total emissions and tool count from ITC and IPC. Gamma is assigned based on analogy due to similar emission factors for IPC and ITC, where known, for the same gas and wafer size. For cases where no gamma has been measured and a general default gamma factor of 10 is used (see footnote to Table 6.8), the inventory compiler may assume an uncertainty of 500 percent.