



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
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Memorandum

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SUBJECT : Gas Water Heater Ignition of Flammable Liquids

The attached tables present estimated incidents, injuries, and deaths associated with gas water heaters that occurred in U.S. residential structure fires attended by the fire service during the years 1994-1998. Estimates were derived from the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association (NFPA). Incendiary and suspicious fires were excluded. Estimates were derived by applying the percentage of NFIRS residential fires involving consumer products to NFPA's estimates of residential fire losses. Unknowns were allocated proportionately using raking.^{1,2}

From 1994-1998, an estimated 4,900 residential fires annually were associated with gas water heaters, resulting in 20 deaths and 290 civilian injuries annually. Of these, an estimated 790 residential fires annually were associated with a gas water heater ignition of flammable liquids, resulting in 5 deaths and 130 civilian injuries annually.

¹ Izrael, D, Hoaglin, DC, and Battaglia, MP (2000). "A SAS Macro for Balancing a Weighted Sample." Paper 258 SUGI (SAS Users Group International) 25. The SAS programs are available from the authors at Abt Associates, Cambridge, MA.

² Little, R and Rubin, D (1987). Statistical Analysis with Missing Data. New York: John Wiley and Sons.

Table 1
Gas Water Heater Incidents Associated with Flammable Liquids
Residential Structure Fires (Excluding Incendiary and Suspicious Fires), 1994-1998

Year	Total, Gas Water Heaters ¹	Type of Material First Ignited		
		F	Liquids ²	Other Materials ²
1998	4300		610	3670
1997	4600		770	3850
1996	5100		740	4400
1995	5100		750	4310
1994	5300		1010	4300

Source: U.S. Consumer Product Safety Commission / EPHA, data obtained from USFA and NFPA.

¹Estimates rounded to the nearest 100.

²Estimates rounded to the nearest 10.

Table 2
Gas Water Heater Incidents Associated with Flammable Liquids
Residential Structure Fire Deaths (Excluding Incendiary and Suspicious Fires), 1994-1998

Year	Total, Gas Water Heaters ¹	Type of Material First Ignited	
		Flammable Liquids ¹	Other Materials ¹
1998	10	--	10
1997	20	10	10
1996	50	**	40
1995	**	--	--
1994	30	10	20

Source: U.S. Consumer Product Safety Commission / EPHA, data obtained from USFA and NFPA.

¹Estimates rounded to the nearest 10.

**Estimates were less than 5.

Table 3
Gas Water Heater Incidents Associated with Flammable Liquids
Residential Structure Fire Injuries (Excluding Incendiary and Suspicious Fires), 1994-1998

Year	Total, Gas Water Heaters ¹	Type of Material First Ignited	
		Flammable Liquids ¹	Other Materials ¹
1998	270	110	160
1997	200	90	110
1996	290	120	160
1995	360	170	190
1994	330	170	160

Source: U.S. Consumer Product Safety Commission / EPHA, data obtained from USFA and NFPA.

¹Estimates rounded to the nearest 10.