APPENDIX A: TOXICOLOGICAL DATA

TABLE A.1
LC_{50} AND IC_{50} VALUES FOR WELL-VENTILATED FLAMING COMBUSTION

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
Acrylonitrile butadiene styrene					
Pellets	1	15.0	12.3, 18.3	10.6	7.4, 15.2
Pellets	1	15.6	13.2, 18.4	6.0	4.1, 8.9
Pellets	1	20.8	15.9, 27.2	17.0	15.0, 20.0
Pellets	1	19.3	16.7, 22.3		
Bismaleimide					
No details provided	2	14.9	12.8, 17.2	6.8	5.4, 8.3
Carpet foam (with nylon)	3	108.0	NA		
Carpet jute backing (with nylon)	3	57.0	NA		
Chlorofluoropolymers					
Ethylene-chlorotrifluoroethylene (39.4 % fluorine; 24.6 % chlorine)	4	15.1	NA		
Blown ethylene-chlorotrifluoroethylene (39.4 % fluorine; 24.6 % chlorine)	4	20.0	NA		
Epoxy					
No details provided	2	7.3	NA	6.2	5.2, 7.3
Fabric					
Vinyl	5	32.0	28.0, 37.0		
Fluoropolymers (data set A)					
Ethylene-tetrafluoroethylene (59.4 % fluorine)	4	30.2	22.8, 40.0		
Polyvinylidene fluoride (59.4 % fluorine)	4	27.3	17.9, 41.7		
Tedlar – thin opaque	2	40.0	NA	21.0	14.2, 27.8
Fluorenone-polyester - thin clear film	2	13.2	11.8, 14.6	10.7	9.9, 11.5
Fluoropolymers (data set B)					
Fluorinated ethylene/fluorinated propylene – 76 % fluorine	4	0.075	0.03, 0.27		

TABLE A.1
LC_{50} AND IC_{50} VALUES FOR WELL-VENTILATED FLAMING COMBUSTION

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
Polytetrafluoroethylene- Teflon	6	0.045	0.04, 0.05		
Polytetrafluoroethylene- Teflon	7	0.017	NA		
Polytetrafluoroethylene -powder	1	0.164	0.07, 0.37	0.8	0.06, 1.51
Polytetrafluoroethylene -powder	1	0.400	0.02, 6.81		
Polytetrafluoroethylene -powder	1	0.045	0.04, 0.05	0.25	NA
Modacrylic					
Knit fabric	1	7.1	6.4, 7.9		
Knit fabric	1	4.7	3.2, 6.9	2.8	2.0, 3.0
Knit fabric	1	4.4	3.9, 5.0	3.1	2.2, 4.3
Phenolic resin					
Rigid foam	8	8.4	7.3, 9.5	2.0	NA
Polyacrylonitrile					
No details provided	7	38.7	36.2, 42.4		
No details provided	7	41.8	NA		
Polyester					
NFR Fiberfill	9	30.8	28.2, 33.6		
NFR polyester upholstery fabric	10	37.5	35.3, 39.8		
NFR polyester upholstery fabric with NFR FPU	10	39.0	36.0, 42.2		
NFR laminated circuit boards; polyester resin with $CaCO_3$ filler	11	53.0	NA		
Polyester fabric/PU foam composite	10	42.0	NA		
Polyethylene					
NFR semi-flexible foam	12	35.0	34.0, 41.0		
FR semi-flexible plastic foam	12	31.3	29.3, 33.3		
Wire	1	46.0	NA		
Polyphenylene oxide					
NFR business machine housing	11	31.5	NA		
Polyphenylsulfone					
Pellets	1	25.3	22.0, 29.2	15.0	NA
Pellets	1	36.0	24.9, 39.6	21.8	12.9, 36.7
Pellets	1	11.7	9.1, 15.0	10.0	NA
Pellets	1	19.8	14.8, 26.5		
Polystyrene					
NFR rigid foam; GM-51	1	53.5	NA	30.0	NA

TABLE A.1
LC_{50} AND IC_{50} VALUES FOR WELL-VENTILATED FLAMING COMBUSTION

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
FR foam; GM-49;expanded	13	35.8	23.6, 48.0	17.9	NA
NFR rigid foam; GM-51	1	32.6	30.5, 34.8		
NFR rigid foam; GM-51	1	38.9	37.9, 39.9	28.7	27.5, 30.4
NFR rigid foam; GM-51; extruded	13	33.8	30.7, 36.9	12.7	NA
NFR foam; GM-47; expanded	13	27.8	NA	15.4	12.0, 18.8
NFR TV cabinet housing; high impact polystyrene base formulation	11	40.0	NA		
Polyurethane, Flexible					
NFR FPU #12	9	40.0	NA		
FR FPU #11	9	40.0	NA		
No details provided	5	52.0	46.0, 59.0		
Melamime type foam	5	12.5	9.7 - 16.1		
Melamime type foam with vinyl fabric	5	26.0	24.0 - 28.0		
FR FPU #14	9	27.8	23.3, 33.1		
FR foam; 22.3 kg/m^3	14	26.0	NA		
FR GM-23	13	34.5	31.2, 37.8	15.1	NA
FR GM-27	13	33.1	26.5, 39.7	9.6	6.0, 13.2
NFR FPU #13	10	40.0	NA		
NFR foam; 22.3 kg/m^3	14	40.0	NA		
NFR GM-21	1	38.0	NA	9.6	4.1, 22.1
NFR GM-21	1	49.5	NA	49.5	NA
NFR GM-21	1	40.0	NA	37.5	35.8, 39.3
NFR GM-21	13	43.2	39.8, 46.6	8.3	NA
NFR GM-25	13	37.5	NA	14.5	11.3, 17.7
NFR foam	8	43.2	39.8, 46.6	8.1	6.7, 9.5

TABLE A.1
LC_{50} AND IC_{50} VALUES FOR WELL-VENTILATED FLAMING COMBUSTION

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
NFR upholstered chairs with flexible polyurethane padding foam, a cover fabric, and steel frame; density of foam is 25 kg/m^3	11	35.0	NA		
Polyurethane, Rigid					
NFR foam, 25 mm thick, 96 kg/m^3	15	11.0	10.0 - 13.0		
FR GM-31	13	14.2	NA	6.7	5.5, 7.9
No details provided	5	22.0	21.6, 22.2		
NFR GM-30	1	38.4	NA		
NFR GM-30	1	13.3	12.2, 14.5		
NFR GM-30	1	11.3	7.6, 16.8	8.9	5.1, 15.6
NFR isocyanurate; GM-41	13	11.4	9.3, 13.5	4.1	3.3, 4.9
NFR isocyanurate; GM-43	13	5.8	5.0, 6.6	2.8	2.3, 3.3
NFR GM-29	13	11.2	9.3, 13.1	5.2	3.4, 7.0
NFR GM-35	13	12.1	8.0, 16.2	5.8	4.5, 7.1
NFR GM-37	13	10.9	9.4, 12.4	3.9	2.9, 4.9
NFR GM-39; sprayed	13	16.6	NA	4.8	2.7, 6.9
Polyvinyl chloride, Plasticized					
Plasticized PVC	16	26.0	NA	7.1	4.9, 9.3
CPVC water pipe	3	16.0	NA		
Commercial rigid 1/2" PVC conduit	3	29.5	NA		
Polyvinyl chloride, Resin					
Sheets, 12.7 mm thick, 1,490 kg/m^3 density	15	20.0	NA		
No details provided	5	26.0	21.0, 31.0		
Sheets	15	25.0	NA		
Pellets	1	15.0	10.0, 19.0	6.0	4.0, 8.9
Pellets	1	17.3	14.8, 20.2	18.5	17.5, 19.8
Pellets (w/ zinc ferrocyanide)	1	9.4	7.2 ,12.3	11.8	10.1, 15.1
Pellets (w/ zinc ferrocyanide)	1	14.3	12.5, 16.3	13.2	11.3, 15.4
Pellets (w/ zinc ferrocyanide)	1	15.0	15.0, 15.5		
Tempered Hardwood					

TABLE A.1
LC_{50} AND IC_{50} VALUES FOR WELL-VENTILATED FLAMING COMBUSTION

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
No details provided	17	58.1	40.8 - 67		
Urea formaldehyde					
Foam	8	11.2	10.4, 12.0	7.4	6.5, 8.3
Wires and Cable Products					
Commercial PTFE coaxial wire (product)	3	9.6	NA		
Commercial THHN wire with nylon-PVC jacket (product)	3	55.0	NA		
NFR wire insulation made of cross-linked EVA copolymer (product)	11	51.0	NA		
Wood					
Douglas fir	15	150	NA		
Douglas fir	1	35.8	28.6, 44.9	20.0	16.4, 24.3
Douglas fir	1	45.3	39.0, 52.7	18.4	14.0, 24.1
Douglas fir	1	24.0	19.0, 29.0	14.5	10.0, 19.1
Douglas fir	1	29.6	22.7, 38.6		
Douglas fir	1	38.4	35.2, 41.9	14.0	10.5, 18.6
Douglas fir	1	41.0	33.0, 50.9	21.8	15.5, 30.7
Douglas fir	1	39.8	38.2, 41.4	23.5	23.0, 24.0
Douglas fir	1	29.8	23.9, 37.1	20.9	NA
Douglas fir	18	106.5	NA		
Douglas fir	18	69.4	NA		
Douglas fir	13			13.3	10.1, 16.5
Red oak	1	45.0	39.9, 50.8	40.6	NA
Red oak	1	56.8	51.6, 62.5	34.8	31.1, 39.0
Red oak	1	60.0	56.6, 63.6		

NA: Values not available in literature.

TABLE A.2
LC_{50} VALUES FOR VENTILATION-LIMITED FLAMING COMBUSTION

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
Fabric, vinyl	5	19.0	17.7, 20.9
Polyester, Resin	11	40.5	NA
Polyphenylene oxide	11	24.0	NA
Polyvinyl chloride, Plasticized	5	16.0	13.7, 17.5
Polyurethane, Flexible			
No details provided	5	18.0	16.9, 18.4
FR upholstered chairs with flexible polyurethane padding foam, a cover fabric, and steel frame	11	23.0	NA
Melamime type foam	5	8.0	7.2, 10.4
Melamime type foam with vinyl fabric	5	15.0	14.7, 16.2
Polyurethane, Rigid			
No details provided	5	14.0	14.3, 14.5
Wires and Cable Products			
FR wire insulation made of cross-linked EVA copolymer (product)	15	25.0	NA

NA: Values not available in literature

TABLE A.3

LC_{50} AND IC_{50} VALUES FOR OXIDATIVE PYROLYSIS

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
Acrylonitrile butadiene styrene					
Pellets	1	19.3	13.9, 26.9	21.0	15.1, 25.2
Pellets	1	38.4	NA	5.8	2.8, 8.4
Pellets	1	33.3	23.1, 47.9	23.0	18.5, 27.5
Pellets	1	30.9	21.2, 45.0		
Bismaleimide					
No details provided	2	41.9	38.8, 45.1	20.1	16.3, 24.0
Carpet foam (with nylon)	3	68.0	NA		
Carpet jute backing (with nylon)	3	90.0	NA		
Chlorofluoropolymers					
Ethylene-chlorotrifluoroethylene (39.4 % fluorine; 24.6 % chlorine)	4	20.1	18.4, 22.0		
Blown ethylene-chlorotrifluoroethylene (39.4 % fluorine; 24.6 % chlorine)	4	28.9	20.3, 41.1		
Epoxy					
No details provided	2	11.0	8.9, 13.1	4.1	3.3, 5.0
Fluoropolymers (data set A)					
Ethylene-tetrafluoroethylene - 59.4 % fluorine	4	3.3	NA		
Polyvinylidene fluoride - 59.4 % fluorine	4	24.3	19.1, 31.2		
Tedlar – thin opaque	2	34.0	NA	18.8	12.0, 25.6
Fluorenone-polyester - thin clear film	2	17.2	NA	10.9	NA
Fluoropolymers (data set B)					
Fluorinated ethylene/fluorinated propylene – 76 % fluorine	4	0.05	NA		
Polytetrafluoroethylene - powder	6	0.045	0.02, 0.12		

TABLE A.3
LC_{50} AND IC_{50} VALUES FOR OXIDATIVE PYROLYSIS

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
Polytetrafluoroethylene – powder	1	0.125	0.08, 0.19	0.68	0.31, 1.49
Polytetrafluoroethylene - powder	1	0.235	0.05, 1.20		
Modacrylic					
Knit fabric	1	5.2	4.9, 5.5	2.7	2.1, 3.4
Knit fabric	1	7.8	6.3, 9.7		
Knit fabric	1	7.0	5.0, 9.7	3.0	2.0, 4.0
Knit fabric	1	5.3	4.0, 7.1	3.2	2.8, 3.7
Phenolic resin					
Rigid foam;GM-57	8	5.9	4.8, 7.0	1.5	NA
Polyester					
Fabric	10	5.0	NA		
NFR polyester upholstery fabric	10	39.0	38.4, 39.5		
NFR polyester upholstery fabric with NFR FPU	10	47.5	43.0, 52.5		
Polyester fabric/PU foam composite	10	30.0	NA		
Polyethylene					
NFR semi-flexible polyethylene foam	12	5.3	4.4, 6.6		
FR semi-flexible plastic polyethylene foam	12	6.1	5.3, 6.9		
Polyphenylsulfone					
Pellets	1	18.7	15.2, 23.0	8.8	6.8, 11.2
Pellets	1	32.2	27.7, 37.5	19.0	10.2, 35.3
Pellets	1	10.7	8.4, 13.6	7.0	NA
Pellets	1	9.5	9.1, 10.1		
Polystyrene					
NFR rigid foam; GM-51	1	50.0	NA	50.0	NA
FR foam; GM-49;expanded	13	40.0	NA	30.9	26.2, 35.6
NFR rigid foam; GM-51	1	46.2	NA		
NFR rigid foam; GM-51	1	40.0	NA	40.0	NA
NFR rigid foam; GM-51; extruded	13	40.0	NA	40.0	NA
NFR foam; GM-47; expanded	13	40.0	NA	27.2	23.0, 31.4
Polyurethane, Flexible					

TABLE A.3
LC_{50} AND IC_{50} VALUES FOR OXIDATIVE PYROLYSIS

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
NFR FPU #12	9	37.8	36.6, 39.0		
NFR FPU #13	10	37.0	29.8, 46.0		
NFR foam; 22.3 kg/m^3	14	33.0	NA		
NFR GM-21	1	27.8	16.9, 45.8	7.0	3.6, 13.6
NFR GM-21	1	40.0	31.2, 51.3	20.2	8.6, 47.3
NFR GM-21	1	26.6	15.3, 46.2	53.0	
FR FPU #11	9	17.2	13.2, 22.4		
FR FPU #14	9	40.0	NA		
FR foam; 22.3 kg/m^3	14	23.0	NA		
FR GM-23	13	12.6	10.5, 14.7	7.3	5.5, 9.1
FR GM-27	13	30.5	23.1, 37.9	25.2	4.7, 45.7
NFR GM-21	13	13.4	NA	3.2	1.6, 4.8
NFR GM-25	13	36.9	30.9, 42.9	15.1	12.4, 17.8
NFR foam	8	14.3	11.9, 16.7	4.2	3.3, 5.1
NFR GM-21; 2 PCF	3	34.7	NA		
Polyurethane, Rigid					
NFR GM-30	1	34.0	NA		
NFR GM-30	1	39.6	NA		
NFR GM-30	1	35.1	NA	29.3	NA
FR GM-31	13	40.0	NA	9.0	6.8, 11.2
NFR isocyanurate; GM-41	13	8.0	7.1, 8.9	3.0	2.7, 3.3
NFR isocyanurate; GM-43	13	5.0	4.6, 5.4	3.4	2.8, 4.0
NFR GM-29	13	40.0	NA	8.9	5.1, 12.7
NFR GM-35	13	36.7	NA	10.8	NA
NFR GM-37	13	36.7	NA	6.8	3.4, 10.2
NFR GM-39; sprayed	13	10.9	9.3, 12.5	4.0	2.4, 5.6
Polyvinyl chloride, Plasticized					
CPVC water pipe	3	9.1	NA		
Plasticized PVC	16	21.0	18.8, 23.2	3.4	2.8, 4.0
Commercial rigid 1/2" PVC conduit	3	37.0	NA		
Polyvinyl chloride, Resin					

TABLE A.3
LC_{50} AND IC_{50} VALUES FOR OXIDATIVE PYROLYSIS

Material	Reference	30 min LC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$	30 min IC_{50} Value (with 14 day post-exposure observation) $g \cdot m^{-3}$	95 % Confidence Limits $g \cdot m^{-3}$
Pellets	1	16.0	14.0, 19.0	9.4	NA
Pellets	1	20.0	14.7, 27.2	30.0	NA
Pellets (w/ zinc ferrocyanide)	1	7.6	5.5, 10.5	5.4	5.1, 10.1
Pellets (w/ zinc ferrocyanide)	1	13.3	11.5, 15.4	11.7	10.3, 13.2
Pellets (w/ zinc ferrocyanide)	1	11.3	8.5, 14.9		
Strandboard					
Oriented Strandboard	18	47.0	37.7, 57.3		
Tempered Hardwood					
No details provided	17	86.5	79.4, 93		
Urea formaldehyde					
Foam	8	1.2	1.1,1.3	0.7	0.6, 0.8
Wires and Cable Products					
Commercial PTFE coaxial wire (product)	3	12.5	NA		
Commercial THHN wire with nylon-PVC jacket (product)	3	100.0	NA		
Wood					
Douglas fir	1	16.7	14.5, 19.3	15.0	12.3, 18.2
Douglas fir	1	27.6	22.9, 33.3	10.1	7.2, 14.2
Douglas fir	1	26.8	21.3, 33.7	5.6	3.1, 9.9
Douglas fir	1	24.0	19.9, 29.0	22.0	13.2, 36.7
Douglas fir	1	25.9	20.0, 33.5	10.1	7.2, 14.2
Douglas fir	1	20.4	16.4, 25.3	18.3	14.5, 23.0
Douglas fir	1	22.8	20.2, 25.8	13.5	12.0, 14.2
Douglas fir	1	18.5	17.3, 19.8	14.7	13.3, 16.2
Douglas fir	18	100.8	NA		
Douglas fir	18	64.6	60.6, 77.1		
Douglas fir	13	14.6	8.1, 21.1	4.8	3.8, 5.8
Red oak	1	25.0	18.7, 35.5	25.0	NA
Red oak	1	30.3	26.0, 35.4	23.0	NA
Red oak	1	35.0	24.5, 50.1	24.1	NA

NA: Values not available in literature.

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