IFA
Institut für Arbeitsschutz der
Deutschen Gesetzlichen Unfallversicherung

MEGA evaluations for the preparation of REACH exposure scenarios for lead

1 Introduction

The measured data for workplace exposure evaluated in the following have been gathered and documented in accordance with the principles of the measurement system of the German social accident insurance institutions for exposure assessment (MGU[1], formerly BGMG). The quality of the MGU is upheld by a quality management system that in essence satisfies the requirements of DIN EN ISO 9001. The test laboratories are operated in accordance with DIN EN ISO 17025 “General requirements for the competence of testing and calibration laboratories”.

To measure lead exposure at the workplace, a defined volume of air is sucked by a suitable pump through a particle filter (membrane filter). The lead and its compounds contained in separated dust are analysed after wet digestion by atomic absorption spectrometry. The quantification limit is 0.03 mg/m³ for personal measurements with 0.42 m³ sample air volume and 0.001 mg/m³ for stationary measurements with 45 m³ sample air volume. Source: Lead (ref. no. 6310). In: IFA-Arbeitsmappe Messung von Gefahrstoffen. 1. Lfg. VI/89. Ed.: Deutsche Gesetzliche Unfallversicherung (DGUV), Berlin. Erich Schmidt, Berlin, 2011 – loose-leaf edition.

All the surveyed data in the MGU are brought together in the MEGA exposure database (measured data on exposure to hazardous substances at the workplace). If individual values fall below the measurement method’s analytical quantification limit, half the value is adopted in the evaluation. The MEGA^{Pro} software developed by the IFA (formerly BGIA) makes it possible to statistically analyse the data of the MEGA exposure database on the basis of various selection criteria and evaluation strategies.

[1] Gabriel, S.; Koppisch, D.; Range, D.: The MGU – a monitoring system for the collection and documentation of valid workplace exposure data. Gefahrstoffe – Reinhalt. Luft 70 (2010) No. 1/2, pp. 43-49 http://www.dguv.de/ifa, Webcode m200066

2 Data situation and evaluation strategy

2.1 Overview of the measured values collected in the MGU, data period 2000 to 2009

Lead and its compounds with an exposure limit value of 0.1 mg/m³
Information on the sampling systems can be found in the IFA work folder (IFA-Arbeitsmappe, in German).

General description	Number of measured values (%)
Total	6232
Type of sampling: Stationary	3142 (50.4%)
Type of sampling: Personal	3090 (49.5%)
Sampling time ≥ 1 h and exposure time ≥ 6 h (comparable to shift measurements)	5178 (83.1%)
Undocumented reference to shift measurements respectively sampling time < 1 h or exposure time < 6 h	1054 (16.9%)
Number of data < quantification limit (Values < quantification limit were adopted in statistics with half their values)	2101 (33.7%)
Number of data > limit value	1019 (16.4%)
Number of data ≥ quantification limit and ≤ limit value	3112 (49.9%)
Examples: Exposure conditions	
Without mechanical ventilation With mechanical ventilation No details	2279 2731 1151
Without local exhaust ventilation With local exhaust ventilation No details	1982 3242 929
General description of lead measurements in 204 branches of industry and 724 work areas	

2.2 Criteria for inclusion of measured data in the evaluation

- Measured data relating to exposure
- Sampling time ≥ 1 hour
- Exposure time ≥ 6 hours
- Data sets comprising fewer than ten measured data were disregarded.

2.3 Evaluation strategy

The evaluation was performed on the basis of industry groups (Appendix 1) and work area groups (Appendix 2) and broken down further according to type of sampling (stationary or personal) and presence of a local exhaust ventilation device. Appendix 3 shows the assignment of work area and industry groups.

3 Abbreviations and indices

The following abbreviations and indices are used in the evaluation tables:

Frequency < values: Number of measured values below the analytical quantification limit

+ The distribution value is below the largest analytical quantification limit in the data set.

$ With reference to the given limit value, the percentage of values below the limit value is given.

! The number of measured values below the analytical quantification limit (a. q.) is greater than the number of measured values represented by this cumulative frequency value. No concentration is therefore given for this cumulative frequency value.

* Measured values below the analytical quantification limit of the measuring method concerned are adopted in the evaluation with half the analytical quantification limit value.

Appendix 1

Statistic evaluations for industry groups

Lead, sampling time ≥ 1 h and exposure time ≥ 6 h
Industry groups, general

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 10 Lead Total	5178	1201	1832 35.4	36	4.8	86.8	+ 0.0048	+ 0.15	+ 0.32
D.No. 151 Lead and its compounds Code 100000-105001 Electricity and power plants	9	4	7 77.8	2	0.0066	88.9			
D.No. 152 Lead and its compounds Code 200000-200400 Chemical industry	90	35	41 45.6	6	0.011	82.2	+ 0.0031	0.27	0.45
D.No. 153 Lead and its compounds Code 210000-215020 Plastics, processing and manufacture; Manufacture and processing of rubber products	226	67	76 33.6	8	0.01	94.7	+ 0.005	0.0584	0.121
D.No. 154 Lead and its compounds Code 215702 Manufacture and treatment of friction lining (brake lining and clutch lining)	58	7	16 27.6	3	0.0054	94.8	+ 0.0035	0.029	0.0686
D.No. 155 Lead and its compounds Code 220000-222902 Stones, Earth, Sand, Precast concrete blocks	124	31	46 37.1	7	0.0053	90.3	+ 0.0025	0.0856	0.196
D.No. 156 Lead and its compounds Code 224000-224900 Porcelain, Pottery, Sanitary, Tiles	472	97	165 35	4	0.015	91.9	+ 0.0036	0.0828	0.192
D.No. 157 Lead and its compounds Code 227000-227451 Hollow glass and flat glass, technical glass	724	96	132 18.2	1	0.04	81.9	+ 0.013	0.216	0.448
D.No. 158 Lead and its compounds Code 230010-232000 Blast furnace, Rolling mills	98	26	4 4.1	6	0.0014	86.7	0.018	0.172	0.353

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 159 Lead and its compounds Code 232001 Lead works	72	6	4 5.6	3	0.015	63.9	0.045	0.258	0.324
D.No. 160 Lead and its compounds Code 234000-238460 Foundry	320	80	33 10.3	8	0.0096	84.4	0.023	0.16	0.3
D.No. 161 Lead and its compounds Code 238700-238717 Electroplating	107	52	50 46.7	7	0.01	89.7	+ 0.0018	0.0939	0.322
D.No. 162 Lead and its compounds Code 239000-239500 Processing of metals	599	165	287 47.9	13	4.8	90.8	+ 0.0018	+ 0.085	+ 0.178
D.No. 163 Lead and its compounds Code 240000-249300 Metal construction and repair shop	538	95	374 69.5	11	4.8	94.8	! a. q.	+ 0.022	+ 0.111
D.No. 164 Lead and its compounds Code 250000 Electrical engineering	423	207	316 74.7	6	0.015	98.1	! a. q.	+ 0.008	0.018
D.No. 165 Lead and its compounds Code 250101-250102 Lead accumulators, Nickel-cadmium batteries	434	19	7 1.6	2	0.0013	64.1	0.066	0.4	0.826
D.No. 166 Lead and its compounds Code 250341-258910 Fine mechanics	84	30	16 19	4	0.0048	91.7	0.014	0.0856	0.168
D.No. 167 Lead and its compounds Code 260100-265000 Treatment of wood	62	19	23 37.1	4	0.0033	96.8	+ 0.0023	0.031	0.0666
D.No. 168 Lead and its compounds Code 268100 Printing office	23	8	21 91.3	3	0.003	100	! a. q.	! a. q.	0.0075
D.No. 169 Lead and its compounds Code 300000-310500 Construction	181	47	101 55.8	10	0.043	92.3	! a. q.	0.0519	0.303

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 170 Lead and its compounds Code 316210-316241 Painting and varnishing	73	18	6 8.2	6	0.01	82.2	0.024	0.158	0.244
D.No. 171 Lead and its compounds Code 404000-420000 Wholesale trade	45	24	20 44.4	2	0.0065	97.8	+ 0.0023	0.0475	0.0648
D.No. 172 Lead and its compounds Code 500000-517340 Transport	47	11	12 25.5	5	0.0093	87.2	0.0166	0.148	0.425
D.No. 173 Lead and its compounds Code 741100-746000 Cleaning of buildings, Waste disposal	225	60	32 14.2	14	0.0064	78.7	0.0165	0.23	0.411
D.No. 174 Lead and its compounds Code 814100-921000 Sports association, Police	108	16	20 18.5	3	0.0029	73.1	0.0098	0.458	1.26

Industry groups: Stationary measurements

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 664 Lead and its compounds Total (stationary measurements)	2588	880	1052 40.6	30	0.045	92.5	+ 0.0024	0.0732	0.166
D.No. 665 Lead and its compounds Code 100000-105001 Electricity and power plants	5	4	4 80	2	0.0017	80			
D.No. 666 Lead and its compounds Code 200000-200400 Chemical industry	35	15	18 51.4	4	0.0048	80	! a. q.	0.41	0.482
D.No. 667 Lead and its compounds Code 210000-215020 Plastics, processing and manufacture; Manufacture and processing of rubber products	117	43	46 39.3	7	0.0065	100	+ 0.0029	0.0216	0.0342
D.No. 668 Lead and its compounds Code 215702 Manufacture and treatment of friction lining (brake lining and clutch lining)	26	2	6 23.1	1	0.0038	100	+ 0.0019	0.0208	0.0227
D.No. 669 Lead and its compounds Code 220000-222902 Stones, Earth, Sand, Precast concrete blocks	89	29	40 44.9	6	0.0021	91	+ 0.0010	0.0552	0.191
D.No. 670 Lead and its compounds Code 224000-224900 Porcelain, Pottery, Sanitary, Tiles	338	95	141 41.7	4	0.0048	96.7	+ 0.002	0.034	0.0835
D.No. 671 Lead and its compounds Code 227000-227451 Hollow glass and flat glass, technical glass	541	93	118 21.8	1	0.04	87.6	+ 0.0078	0.13	0.27
D.No. 672 Lead and its compounds Code 230010-232000 Blast furnace, Rolling mills	63	20	1 1.6	6	0.001	92.1	0.016	0.0749	0.254
D.No. 673 Lead and its compounds Code 232001 Lead works	24	3	0	3		87.5	0.0062	0.135	0.236

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 674 Lead and its compounds Code 234000-238460 Foundry	205	68	26 12.7	7	0.0096	87.3	0.016	0.125	0.275
D.No. 675 Lead and its compounds Code 238700-238717 Electroplating	57	38	33 57.9	6	0.01	98.2	! a. q.	0.0136	0.0331
D.No. 676 Lead and its compounds Code 239000-239500 Processing of metals	248	112	109 44	12	0.045	91.5	+ 0.0017	0.085	0.14
D.No. 677 Lead and its compounds Code 240000-249300 Metal construction and repair shop	132	53	97 73.5	9	0.045	96.2	! a. q.	+ 0.0208	0.0478
D.No. 678 Lead and its compounds Code 250000 Electrical engineering	307	160	261 85	5	0.015	100	! a. q.	+ 0.0034	+ 0.0053
D.No. 679 Lead and its compounds Code 250101-250102 Lead accumulators, Nickel-cadmium batteries	32	6	6 18.8	2	0.0013	93.8	0.014	0.0646	0.0842
D.No. 680 Lead and its compounds Code 250341-258910 Fine mechanics	28	16	7 25	4	0.0048	100	0.0064	0.0356	0.0506
D.No. 681 Lead and its compounds Code 260100-265000 Treatment of wood	28	14	16 57.1	4	0.0029	100	! a. q.	0.0114	0.025
D.No. 682 Lead and its compounds Code 268100 Printing office	19	7	18 94.7	3	0.003	100	! a. q.	! a. q.	+ 0.0019
D.No. 683 Lead and its compounds Code 300000-310500 Construction	58	22	33 56.9	9	0.043	96.6	! a. q.	+ 0.0049	+ 0.0184
D.No. 684 Lead and its compounds Code 316210-316241 Painting and varnishing	25	10	2 8	4	0.01	96	0.02	0.08	0.0848

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 685 Lead and its compounds Code 404000-420000 Wholesale trade	21	15	14 66.7	2	0.0048	100	! a. q.	0.0061	0.044
D.No. 686 Lead and its compounds Code 500000-517340 Transport	13	5	6 46.2	3	0.0093	76.9	+ 0.0030 2	0.432	1.375
D.No. 687 Lead and its compounds Code 741100-746000 Cleaning of buildings, Waste disposal	96	38	20 20.8	12	0.0064	84.4	+ 0.0047	0.157	0.381
D.No. 688 Lead and its compounds Code 814100-921000 Sports association, Police	53	14	10 18.9	1	0.0029	69.8	0.017	1.04	3.115

Industry groups: Personal measurements

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 701 Lead Total (personal measurements)	2590	725	780 30.1	30	4.8	81.2	+ 0.011	+ 0.22	+ 0.48
D.No. 702 Lead and its compounds Code 100000-105001 Electricity and power plants	4	2	3 75	2	0.0066	100			
D.No. 703 Lead and its compounds Code 200000-200400 Chemical industry	55	26	23 41.8	5	0.011	83.6	+ 0.0054	0.255	0.328
D.No. 704 Lead and its compounds Code 210000-215020 Plastics, processing and manufacture; Manufacture and processing of rubber products	109	48	30 27.5	7	0.01	89	0.011	0.131	0.254
D.No. 705 Lead and its compounds Code 215702 Manufacture and treatment of friction lining (brake lining and clutch lining)	32	7	10 31.3	3	0.0054	90.6	+ 0.0045	0.063	0.11
D.No. 706 Lead and its compounds Code 220000-222902 Stones, Earth, Sand, Precast concrete blocks	35	14	6 17.1	6	0.0053	88.6	0.015	0.109	0.203
D.No. 707 Lead and its compounds Code 224000-224900 Porcelain, Pottery, Sanitary, Tiles	134	52	24 17.9	2	0.015	79.9	+ 0.014	0.236	0.624
D.No. 708 Lead and its compounds Code 227000-227451 Hollow glass and flat glass, technical glass	183	50	14 7.7	1	0.0048	65	0.0565	0.478	0.668
D.No. 709 Lead and its compounds Code 230010-232000 Blast furnace, Rolling mills	35	17	3 8.6	6	0.0014	77.1	0.0305	0.195	1.55
D.No. 710 Lead and its compounds Code 232001 Lead works	48	5	4 8.3	3	0.015	52.1	0.087	0.32	0.486

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 711 Lead and its compounds Code 234000-238460 Foundry	115	42	7 6.1	8	0.0067	79.1	0.0345	0.175	0.3
D.No. 712 Lead and its compounds Code 238700-238717 Electroplating	50	30	17 34	6	0.01	80	+ 0.0046	0.27	0.545
D.No. 713 Lead and its compounds Code 239000-239500 Processing of metals	351	117	178 50.7	12	4.8	90.3	! a. q.	+ 0.0849	+ 0.204
K.Nr714 Lead and its compounds Code 240000-249300 Metal construction and repair shop	406	70	277 68.2	10	4.8	94.3	! a. q.	+ 0.0216	+ 0.141
D.No. 715 Lead and its compounds Code 250000 Electrical engineering	116	74	55 47.4	4	0.0073	93.1	+ 0.0022	0.0472	0.14
D.No. 716 Lead and its compounds Code 250101-250102 Lead accumulators, Nickel-cadmium batteries	402	19	1 0.2	2	0.0013	61.7	0.075	0.418	0.912
D.No. 717 Lead and its compounds Code 250341-258910 Fine mechanics	56	24	9 16.1	3	0.0048	87.5	0.021	0.12	0.23
D.No. 718 Lead and its compounds Code 260100-265000 Treatment of wood	34	13	7 20.6	2	0.0033	94.1	0.0037	0.0564	0.106
D.No. 719 Lead and its compounds Code 268100 Printing office	4	3	3 75	3	0.0013	100			
D.No. 720 Lead and its compounds Code 300000-310500 Construction	123	34	68 55.3	9	0.024	90.2	! a. q.	0.0876	0.602
D.No. 721 Lead and its compounds Code 316210-316241 Painting and varnishing	48	17	4 8.3	6	0.01	75	0.037	0.182	0.254

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 722 Lead and its compounds Code 404000-420000 Wholesale trade	24	15	6 25	1	0.0065	95.8	+ 0.0033	0.0526	0.079
D.No. 723 Lead and its compounds Code 500000-517340 Transport	34	9	6 17.6	4	0.0017	91.2	0.028	0.0952	0.154
D.No. 724 Lead and its compounds Code 741100-746000 Cleaning of buildings, Waste disposal	129	41	12 9.3	11	0.005	74.4	0.0309	0.234	0.438
D.No. 725 Lead and its compounds Code 814100-921000 Sports association, Police	55	16	10 18.2	3	0.0028	76.4	0.0077	0.35	0.46

Industry groups: Measurements with local exhaust ventilation

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 775 Lead and its compounds Total (with local exhaust ventilation)	2724	763	946 34.7	26	4.8	85.5	+ 0.0059	+ 0.167	+ 0.35
D.No. 776 Lead and its compounds Code 100000-105001 Electricity and power plants	4	2	3 75	1	0.0066	75			
D.No. 777 Lead and its compounds Code 200000-200400 Chemical industry	54	19	21 38.9	4	0.0056	72.2	0.0065	0.414	0.483
D.No. 778 Lead and its compounds Code 210000-215020 Plastics, processing and manufacture; Manufacture and processing of rubber products	105	44	34 32.4	8	0.0065	92.4	+ 0.0059	0.0665	0.172
D.No. 779 Lead and its compounds Code 215702 Manufacture and treatment of friction lining (brake lining and clutch lining)	37	6	11 29.7	3	0.0038	91.9	+ 0.0023	0.0605	0.11
D.No. 780 Lead and its compounds Code 220000-222902 Stones, Earth, Sand, Precast concrete blocks	68	14	16 23.5	4	0.0053	88.2	0.0076	0.134	0.21
D.No. 781 Lead and its compounds Code 224000-224900 Porcelain, Pottery, Sanitary, Tiles	334	82	115 34.4	3	0.015	90.7	+ 0.0037	0.0916	0.233
D.No. 782 Lead and its compounds Code 227000-227451 Hollow glass and flat glass, technical glass	273	58	57 20.9	1	0.04	78.4	+ 0.0205	0.364	0.557
D.No. 783 Lead and its compounds Code 230010-232000 Blast furnace, Rolling mills	57	15	1 1.8	5	0.0014	82.5	0.0255	0.272	0.932
D.No. 784 Lead and its compounds Code 232001Lead works	42	3	0	2		57.1	0.075	0.292	0.32

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 785 Lead and its compounds Code 234000-238460 Foundry	177	54	18 10.2	7	0.0096	84.2	0.0235	0.16	0.315
D.No. 786 Lead and its compounds Code 238700-238717 Electroplating	84	41	41 48.8	7	0.01	90.5	+ 0.0017	0.0858	0.334
D.No. 787 Lead and its compounds Code 239000-239500 Processing of metals	339	111	171 50.4	10	0.0068	93.5	! a. q.	0.0611	0.14
D.No. 788 Lead and its compounds Code 240000-249300 Metal construction and repair shop	242	63	163 67.4	7	4.8	95.9	! a. q.	+ 0.0186	+ 0.0676
D.No. 789 Lead and its compounds Code 250000 Electrical engineering	291	158	209 71.8	4	0.01	97.9	! a. q.	+ 0.00829	0.0287
D.No. 790 Lead and its compounds Code 250101-250102 Lead accumulators, Nickel-cadmium batteries	364	18	7 1.9	1	0.0013	63.5	0.072	0.4	0.904
D.No. 791 Lead and its compounds Code 250341-258910 Fine mechanics	51	21	12 23.5	4	0.0048	88.2	0.0145	0.117	0.198
D.No. 792 Lead and its compounds Code 260100-265000 Treatment of wood	27	10	11 40.7	1	0.0033	100	+ 0.0022	0.0163	0.0209
D.No. 793 Lead and its compounds Code 268100 Printing office	13	6	11 84.6	2	0.003	100	! a. q.	0.0064	0.0381
D.No. 794 Lead and its compounds TBA 300000-310500 Construction	28	8	12 42.9	5	0.024	92.9	+ 0.0013	+ 0.0072	0.191
D.No. 795 Lead and its compounds Code 316210-316241 Painting and varnishing	9	2	2 22.2	2	0.01	66.7			

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 796 Lead and its compounds Code 404000-420000 Wholesale trade	16	9	9 56.3	1	0.0065	93.8	! a. q.	0.028	0.149
D.No. 797 Lead and its compounds Code 500000-517340 Transport	10	6	3 30	3	0.0014	90	0.0094	0.1	0.18
D.No. 798 Lead and its compounds Code 741100-746000 Cleaning of buildings, Waste disposal	65	24	4 6.2	11	0.0064	73.8	0.048	0.21	0.253
D.No. 799 Lead and its compounds Code 814100-921000 Sports association, Police	22	5	8 36.4	2	0.0027	81.8	+ 0.002	0.28	0.318

Industry groups: Measurements without local exhaust ventilation

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 738 Lead and its compounds Total (without local exhaust ventilation)	1633	486	636 38.9	25	0.043	89.5	+ 0.0035	0.11	0.22
D.No. 739 Lead and its compounds Code 100000-105001 Electricity and power plants	4	3	4 100	2	0.0017	100			
D.No. 740 Lead and its compounds Code 200000-200400 Chemical industry	21	14	10 47.6	4	0.01	95.2	+ 0.0027	0.0548	0.0664
D.No. 741 Lead and its compounds Code 210000-215020 Plastics, processing and manufacture; Manufacture and processing of rubber products	77	30	21 27.3	7	0.0096	96.1	+ 0.0046	0.0525	0.089
D.No. 742 Lead and its compounds Code 215702 Manufacture and treatment of friction lining (brake lining and clutch lining)	21	2	5 23.8	1	0.0054	100	0.0057	0.0198	0.0276
D.No. 743 Lead and its compounds Code 220000-222902 Stones, Earth, Sand, Precast concrete blocks	19	10	12 63.2	2	0.002	94.7	! a. q.	0.0043	0.0146
D.No. 744 Lead and its compounds PN ≥ 1 h Code 224000-224900 Porcelain, Pottery, Sanitary, Tiles	70	34	31 44.3	2	0.0025	100	+ 0.0013	0.023	0.034
D.No. 745 Lead and its compounds Code 227000-227451 Hollow glass and flat glass, technical glass	275	53	41 14.9	1	0.0048	85.1	0.011	0.15	0.24
D.No. 746 Lead and its compounds Code 230010-232000 Blast furnace, Rolling mills	36	14	3 8.3	6	0.001	94.4	0.016	0.0524	0.0936

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 747 Lead and its compounds Code 232001Lead works	11	4	4 36.4	2	0.015	54.5	0.0288	0.248	0.858
D.No. 748 Lead and its compounds Code 234000-238460 Foundry	123	29	14 11.4	6	0.0064	84.6	0.022	0.147	0.208
D.No. 749 Lead and its compounds Code 238700-238717 Electroplating	17	8	7 41.2	2	0.0015	94.1	+ 0.0010	0.0201	0.0677
D.No. 750 Lead and its compounds Code 239000-239500 Processing of metals	225	65	95 42.2	11	0.007	86.7	+ 0.0024	0.14	0.217
D.No. 751 Lead and its compounds Code 240000-249300 Metal construction and repair shop	259	45	195 75.3	10	0.015	96.5	! a. q.	+ 0.0076	0.0563
D.No. 752 Lead and its compounds Code 250000 Electrical engineering	96	58	78 81.3	4	0.015	99	! a. q.	+ 0.0059	+ 0.0088
D.No. 753 Lead and its compounds Code 250101-250102 Lead accumulators, Nickel-cadmium batteries	47	9	0	1		61.7	0.0505	0.248	0.609
D.No. 754 Lead and its compounds Code 250341-258910 Fine mechanics	31	13	4 12.9	3	0.0048	96.8	0.00945	0.0573	0.0712
D.No. 755 Lead and its compounds Code 260100-265000 Treatment of wood	23	9	7 30.4	3	0.0024	95.7	0.0035	0.0344	0.0648
D.No. 757 Lead and its compounds Code 300000-310500 Construction	76	17	56 73.7	7	0.043	90.8	! a. q.	0.0732	1.036
D.No. 758 Lead and its compounds Code 316210-316241 Painting and varnishing	33	8	0	4		78.8	0.041	0.165	0.204

D.No. = Data set number/ Designation Branch of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 759 Lead and its compounds Code 404000-420000 Wholesale trade	17	10	8 47.1	2	0.0048	100	+ 0.0018	0.0354	0.0595
D.No. 760 Lead and its compounds Code 500000-517340 Transport	35	7	8 22.9	3	0.0093	85.7	0.0166	0.174	1.129
D.No. 761 Lead and its compounds Code 741100-746000 Cleaning of buildings, Waste disposal	93	34	17 18.3	11	0.0048	82.8	0.0083	0.258	0.481
D.No. 762 Lead and its compounds Code 814100-921000 Sports association, Police	12	4	6 50	1	0.0029	66.7	+ 0.0027	0.244	0.516

Appendix 2

Statistical evaluations for work area groups

Lead, sampling time ≥ 1 h and exposure time ≥ 6 h
Work area groups: General

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 274 Lead and its compounds Storing, Conveying	158	72	67 42.4	18	0.01	94.3	+ 0.0018	0.0626	0.107
D.No. 275 Lead and its compounds Milling, Reducing, Classifying	188	65	36 19.1	8	0.01	85.6	0.012	0.152	0.312
D.No. 276 Lead and its compounds Mixing	216	74	54 25	9	0.011	87.5	+ 0.0097	0.118	0.368
D.No. 277 Lead and its compounds Drying, Sintering, Roasting, Smelting	507	148	45 8.9	12	0.04	78.3	+ 0.029	0.24	0.486
D.No. 278 Lead and its compounds Processing, general	561	209	144 25.7	18	0.045	85.4	+ 0.0073	0.17	0.359
D.No. 854 Lead and its compounds Sawing	44	15	3 6.8	5	0.0016	77.3	0.04	0.18	0.198
D.No. 855 Lead and its compounds Turning, planing	33	10	7 21.2	3	0.0067	78.8	0.0395	0.134	0.284
D.No. 856 Lead and its compounds Sanding	80	28	27 33.8	10	0.0056	86.3	+ 0.0034	0.36	1
D.No. 857 Lead and its compounds Polishing	38	16	13 34.2	5	0.005	94.7	0.0051	0.054	0.0632
D.No. 279 Lead and its compounds Filling, weighing	130	67	39 30	12	0.0067	88.5	+ 0.0033	0.15	0.395

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 280 Lead and its compounds Cleaning, Repair, Inspection	203	108	87 42.9	21	0.0066	95.1	+ 0.0022	0.051	0.0878
D.No. 281 Lead and its compounds Surface coating	722	235	304 42.1	11	0.015	92.1	+ 0.0024	0.083	0.18
D.No. 282 Lead and its compounds Transport, general	43	12	8 18.6	6	0.0093	79.1	0.022	0.147	0.257
D.No. 284 Lead and its compounds Hard soldering	57	32	31 54.4	7	0.0029	86	! a. q.	0.143	0.351
D.No. 285 Lead and its compounds Soft soldering	501	229	323 64.5	11	0.045	93.8	! a. q.	0.0477	0.13
D.No. 286 Lead and its compounds Moulds (moulding)	138	33	18 13	5	0.0018	84.1	0.015	0.142	0.233
D.No. 853 Lead and its compounds Compacting, pressing	124	46	30 24.2	9	0.015	94.4	+ 0.009	0.0802	0.108
D.No. 858 Lead and its compounds Firing range	126	19	21 16.7	4	0.0029	73	0.015	0.42	1.17
D.No. 283 Lead and its compounds Welding	701	105	503 71.8	15	4.8	96.9	! a. q.	+ 0.0075	+ 0.0169
D.No. 859 Lead and its compounds Metal active gas welding (MAG)	287	42	217 75.6	6	4.8	99.3	! a. q.	+ 0.003	+ 0.0035
D.No. 860 Lead and its compounds Tungsten inert gas welding (TIG)	162	29	143 88.3	6	0.015	100	! a. q.	+ 0.0031	+ 0.0075

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 861 Lead and its compounds Metal flux-cored self-shielded arc welding with inert gas	103	11	56 54.4	4	0.024	99	! a. q.	+ 0.0117	+ 0.0157
D.No. 287 Lead and its compounds Lead accumulators, general	412	17	7 1.7	1	0.0013	63.8	0.069	0.408	0.828
D.No. 288 Lead and its compounds Lead accumulators, foundry	68	14	0	1		83.8	0.038	0.152	0.18
D.No. 290 Lead and its compounds Lead accumulators, mixing	11	5	0	1		63.6	0.0575	0.328	4.057
D.No. 291 Lead and its compounds Lead accumulators, paste application	56	11	0	1		50	0.1	0.64	0.816
D.No. 292 Lead and its compounds Lead accumulators, subsequent treatment of plates	53	11	0	1		49.1	0.102	1.4	2.135
D.No. 293 Lead and its compounds Lead accumulators, installation	196	15	7 3.6	1	0.0013	65.8	0.073	0.29	0.518
D.No. 661 Lead and its compounds Lead accumulators, tubular plates	14	4	0	1		21.4	0.18	1.52	1.72

Work area groups: Stationary measurements

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 871 Lead and its compounds Storing, Conveying	105	50	49 46.7	15	0.0055	97.1	+ 0.0015	0.031	0.0673
D.No. 872 Lead and its compounds Milling, Reducing, Classifying	92	44	18 19.6	8	0.0064	88	0.0081	0.127	0.237
D.No. 873 Lead and its compounds Mixing	101	43	34 31.2	6	0.0034	95.4	0.0064	0.053	0.0696
D.No. 874 Lead and its compounds Drying, Sintering, Roasting, Smelting	326	121	36 11	12	0.04	82.2	+ 0.017	0.224	0.48
D.No. 875 Lead and its compounds Processing	298	142	95 31.9	13	0.0067	89.6	+ 0.0039	0.11	0.202
D.No. 863 Lead and its compounds Sawing	18	10	3 16.7	5	0.0016	88.9	0.022	0.09	0.114
D.No. 864 Lead and its compounds Turning, planing	8	6	4 50	3	0.0067	87.5			
D.No. 865 Lead and its compounds Sanding	38	20	11 28.9	9	0.0048	86.8	0.0059	0.184	0.533
D.No. 866 Lead and its compounds Polishing	15	8	8 53.3	3	0.0042	100	! a. q.	0.0415	0.0527
D.No. 876 Lead and its compounds Filling, weighing	71	44	24 33.8	10	0.0065	97.2	+ 0.0019	0.0447	0.0714
D.No. 877 Lead and its compounds Cleaning, Repair, Inspection	120	73	67 55.8	18	0.0065	97.5	! a. q.	0.013	0.033
D.No. 878 Lead and its compounds Surface coating	491	197	243 49.5	10	0.01	96.5	+ 0.001	0.034	0.083
D.No. 879 Lead and its compounds Transport, general	11	7	6 54.5	6	0.0093	81.8	! a. q.	0.217	0.363

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 881 Lead and its compounds Hard soldering	31	20	26 83.9	6	0.0029	100	! a. q.	+ 0.0008	+ 0.0011
D.No. 882 Lead and its compounds Soft soldering	356	180	262 73.6	8	0.045	98.3	! a. q.	+ 0.0154	+ 0.0322
D.No. 883 Lead and its compounds Moulds (moulding)	114	31	17 14.9	5	0.0018	85.1	0.014	0.136	0.209
D.No. 862 Lead and its compounds Compacting, pressing	77	34	19 24.7	9	0.015	98.7	+ 0.00725	0.0721	0.082
D.No. 867 Lead and its compounds Firing range	54	15	10 18.5	2	0.0029	70.4	0.017	1.02	2.97
D.No. 880 Lead and its compounds Welding	101	48	65 64.4	13	0.045	94.1	! a. q.	+ 0.0225	0.118
D.No. 868 Lead and its compounds Metal active gas welding (MAG)	38	15	27 71.1	5	0.0063	100	! a. q.	+ 0.0014	+ 0.0033
D.No. 869 Lead and its compounds Tungsten inert gas welding (TIG)	11	8	7 63.6	4	0.015	100	! a. q.	+ 0.0124	0.0188
D.No. 870 Lead and its compounds Metal flux-cored self-shielded arc welding with inert gas	6	4	1 16.7	2	0.0025	100			
D.No. 825 Lead and its compounds Lead accumulators, general	29	4	6 20.7	1	0.0013	93.1	0.023	0.0661	0.0906
D.No. 831 Lead and its compounds Lead accumulators, installation	21	3	6 28.6	1	0.0013	90.5	0.028	0.0662	0.108

Work area groups: Personal measurements

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 891 Lead and its compounds Storing, Conveying	53	34	18 34	12	0.01	88.7	+ 0.0043	0.171	0.608
D.No. 892 Lead and its compounds Milling, Reducing, Classifying	96	43	18 18.8	8	0.01	83.3	0.019	0.196	0.332
D.No. 893 Lead and its compounds Mixing	108	57	20 16.9	7	0.011	79.6	0.02	0.296	0.546
D.No. 894 Lead and its compounds Drying, Sintering, Roasting, Smelting	181	79	9 5	12	0.0048	71.3	0.048	0.249	0.581
D.No. 895 Lead and its compounds Processing	263	130	49 18.6	18	0.045	80.6	+ 0.014	0.261	0.609
D.No. 911 Lead and its compounds Sawing	26	9	0	4		69.2	0.049	0.194	0.291
D.No. 912 Lead and its compounds Turning, planing	25	7	3 12	3	0.0067	76	0.0435	0.13	0.237
D.No. 913 Lead and its compounds Sanding	42	20	16 38.1	9	0.0056	85.7	+ 0.0028	0.552	0.998
D.No. 914 Lead and its compounds Polishing	23	14	5 21.7	5	0.005	91.3	0.0065	0.0565	0.102
D.No. 896 Lead and its compounds Filling, weighing	59	39	15 25.4	8	0.0067	78	0.0086	0.371	0.563

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 897 Lead and its compounds Cleaning, Repair, Inspection	83	51	20 24.1	13	0.0066	91.6	0.0075	0.0864	0.234
D.No. 898 Lead and its compounds Surface coating	231	115	61 26.4	9	0.015	82.7	+ 0.0099	0.199	0.359
D.No. 899 Lead and its compounds Transport, general	32	8	2 6.3	4	0.0017	78.1	0.034	0.138	0.194
D.No. 901 Lead and its compounds Hard soldering	26	16	5 19.2	6	0.0014	69.2	0.015	0.354	0.619
D.No. 902 Lead and its compounds Soft soldering	145	88	61 42.1	11	0.0073	82.8	+ 0.0024	0.205	0.455
D.No. 903 Lead and its compounds Moulds (moulding)	24	7	1 4.2	3	0.0013	79.2	0.019	0.202	0.254
D.No. 910 Lead and its compounds Compacting, pressing	47	29	11 23.4	6	0.0096	87.2	0.0145	0.122	0.196
D.No. 915 Lead and its compounds Firing range	72	19	11 15.3	4	0.0028	75	0.011	0.344	0.432
D.No. 900 Lead and its compounds Welding	600	88	438 73	15	4.8	97.3	! a. q.	+ 0.0073	+ 0.012
D.No. 916 Lead and its compounds Metal active gas welding (MAG)	249	38	190 76.3	6	4.8	99.2	! a. q.	+ 0.00301	+ 0.0035
D.No. 917 Lead and its compounds Tungsten inert gas welding (TIG)	151	26	136 90.1	6	0.015	100	! a. q.	! a. q.	+ 0.0075

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 918 Lead and its compounds Metal flux-cored self-shielded arc welding with inert gas	97	10	55 56.7	3	0.024	99	! a. q.	+ 0.012	+ 0.016
D.No. 904 Lead and its compounds Lead accumulators, general	383	17	1 0.3	1	0.0013	61.6	0.075	0.455	0.908
D.No. 905 Lead and its compounds Lead accumulators, foundry	66	13	0	1		83.3	0.042	0.154	0.18
D.No. 906 Lead and its compounds Lead accumulators, mixing	10	5	0	1		60	0.062	0.34	4.47
D.No. 907 Lead and its compounds Lead accumulators, paste application	54	10	0	1		48.1	0.11	0.64	0.834
D.No. 908 Lead and its compounds Lead accumulators, subsequent treatment of plates	51	10	0	1		47.1	0.11	1.4	2.145
D.No. 909 Lead and its compounds Lead accumulators, installation	175	14	1 0.6	1	0.0013	62.9	0.0785	0.33	0.627
D.No. 919 Lead and its compounds Lead accumulators, tubular plates	14	4	0	1		21.4	0.18	1.52	1.72

Work area groups: Measurements without local exhaust ventilation

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 978 Lead and its compounds Storing, Conveying	58	25	22 37.9	15	0.0055	96.6	+ 0.0024	0.0662	0.079
D.No. 979 Lead and its compounds Milling, Reducing, Classifying	73	32	18 24.7	6	0.0061	93.2	0.0072	0.0506	0.127
D.No. 980 Lead and its compounds Mixing	24	15	4 16.7	7	0.01	95.8	+ 0.0077	0.0462	0.059
D.No. 981 Lead and its compounds Drying, Sintering, Roasting, Smelting	130	46	14 10.8	10	0.0064	82.3	0.018	0.21	0.26
D.No. 982 Lead and its compounds Processing	193	75	37 19.2	12	0.0067	85.5	0.012	0.133	0.18
D.No. 999 Lead and its compounds Sawing	23	7	2 8.7	3	0.0011	78.3	0.0345	0.187	0.199
D.No. 1000 Lead and its compounds Turning, planing	24	4	3 12.5	3	0.0067	83.3			
D.No. 1001 Lead and its compounds Sanding	18	9	10 55.6	7	0.0048	94.4	! a. q.	0.046	0.209
D.No. 1002 Lead and its compounds Polishing	5	4	1 20	3	0.0013	60			
D.No. 983 Lead and its compounds Filling, weighing	39	28	19 48.7	11	0.0065	92.3	+ 0.00175	0.0737	0.196
D.No. 984 Lead and its compounds Cleaning, Repair, Inspection	105	57	42 40	15	0.0066	93.3	+ 0.0024	0.0585	0.14

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 985 Lead and its compounds Surface coating	170	81	73 42.9	10	0.015	95.9	+ 0.0029	0.05	0.086
D.No. 986 Lead and its compounds Transport, general	28	8	5 17.9	4	0.0093	75	0.019	0.16	0.404
D.No. 988 Lead and its compounds Hard soldering	18	9	4 22.2	4	0.0029	55.6	0.042	0.434	0.817
D.No. 989 Lead and its compounds Soft soldering	130	69	75 57.7	10	0.043	92.3	! a. q.	0.064	0.125
D.No. 990 Lead and its compounds Moulds (moulding)	91	16	10 11	5	0.0016	75.8	0.022	0.197	0.284
D.No. 998 Lead and its compounds Compacting, pressing	59	23	13 22	9	0.015	98.3	+ 0.0071	0.0691	0.0824
D.No. 1003 Lead and its compounds Firing range	12	4	6 50	1	0.0029	66.7			
D.No. 987 Lead and its compounds Welding	350	48	268 76.6	11	0.015	97.7	! a. q.	+ 0.0075	+ 0.0125
D.No. 1004 Lead and its compounds Metal active gas welding (MAG)	146	20	105 71.9	5	0.007	100	! a. q.	+ 0.0026	+ 0.0035
D.No. 1005 Lead and its compounds Tungsten inert gas welding (TIG)	110	13	103 93.6	3	0.015	100	! a. q.	! a. q.	+ 0.0075
D.No. 1006 Lead and its compounds Metal flux-cored self-shielded arc welding with inert gas	47	5	31 66	1	0.015	100			

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
D.No. 991 Lead and its compounds Lead accumulators, general	38	9	0	1		63.2	0.05	0.342	0.645
D.No. 992 Lead and its compounds Lead accumulators, foundry	5	3	0	1		100			
D.No. 993 Lead and its compounds Lead accumulators, mixing	5	3	0	1		60			
D.No. 994 Lead and its compounds Lead accumulators, paste application	12	4	0	1		25	0.13	0.622	0.66
D.No. 995 Lead and its compounds Lead accumulators, subsequent treatment of plates	4	1	0	1		50			
D.No. 996 Lead and its compounds Lead accumulators, installation	5	2	0	1		100			
D.No. 997 Lead and its compounds Lead accumulators, tubular plates	3	1	0	1		66.7			

Work area groups: Measurements with local exhaust ventilation

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percen-tile *	90 per-centile *	95 percen-tile *
D.No. 1007 Lead and its compounds Storing, Conveying	21	14	7 33.3	5	0.0066	76.2	+ 0.0034	0.56	0.637
D.No. 1008 Lead and its compounds Milling, Reducing, Classifying	72	30	7 9.7	6	0.0064	75	0.026	0.228	0.398
D.No. 1009 Lead and its compounds Mixing	161	56	43 26.7	7	0.0038	85.7	0.0096	0.149	0.435
D.No. 1010 Lead and its compounds Drying, Sintering, Roasting, Smelting	310	103	25 8.1	11	0.04	75.5	0.043	0.3	0.545
D.No. 1011 Lead and its compounds Processing	264	127	95 36	14	0.045	88.6	+ 0.0034	0.136	0.428
D.No. 1028 Lead and its compounds Sawing	8	5	1 12.5	4	0.0016	62.5			
D.No. 1029 Lead and its compounds Turning, planing	8	5	3 37.5	3	0.0007	62.5			
D.No. 1030 Lead and its compounds Sanding	49	20	16 32.7	8	0.0056	85.7	+ 0.0028	0.387	1.055
D.No. 1031 Lead and its compounds Polishing	27	12	11 40.7	4	0.005	100	+ 0.00355	0.012	0.0172
D.No. 1012 Lead and its compounds Filling, weighing	69	37	15 21.7	8	0.0067	82.6	0.0086	0.311	0.452

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percen-tile *	90 per-centile *	95 percen-tile *
D.No. 1013 Lead and its compounds Cleaning, Repair, Inspection	53	33	26 49.1	10	0.0053	98.1	+ 0.0024	0.0402	0.0804
D.No. 1014 Lead and its compounds Surface coating	447	156	177 39.6	9	0.015	90.8	+ 0.0025	0.0903	0.206
D.No. 1015 Lead and its compounds Transport, general	8	4	3 37.5	3	0.0017	87.5			
D.No. 1017 Lead and its compounds Hard soldering	36	23	25 69.4	7	0.0017	100	! a. q.	0.0019	0.018
D.No. 1018 Lead and its compounds Soft soldering	301	156	219 72.8	8	0.045	95.3	! a. q.	+ 0.022	0.0993
D.No. 1019 Lead and its compounds Moulds (moulding)	31	14	8 25.8	5	0.0018	100	0.0135	0.0254	0.0561
D.No. 1027 Lead and its compounds Compacting, pressing	55	26	16 29.1	7	0.0048	90.9	0.0135	0.091	0.188
D.No. 1032 Lead and its compounds Firing range	40	8	9 22.5	3	0.0027	77.5	0.016	0.3	0.35
D.No. 1016 Lead and its compounds Welding	309	61	211 68.3	11	4.8	99.4	! a. q.	+ 0.0055	+ 0.0081
D.No. 1033 Lead and its compounds Metal active gas welding (MAG)	130	26	102 78.5	5	4.8	99.2	! a. q.	+ 0.0032	+ 0.0034
D.No. 1034 Lead and its compounds Tungsten inert gas welding (TIG)	51	18	40 78.4	6	0.0056	100	! a. q.	+ 0.0032	0.0092

D.No. = Data set number/ Designation Work area	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	Largest quantification limit in mg/m³	≤ limit value % $	Concentrations in mg/m³		
							50 percen-tile *	90 per-centile *	95 percen-tile *
D.No. 1035 Lead and its compounds Metal flux-cored self-shielded arc welding with inert gas	49	6	22 44.9	2	0.024	100	+ 0.00217	+ 0.0121	+ 0.014
D.No. 1020 Lead and its compounds Lead accumulators, general	361	17	7 1.9	1	0.0013	63.7	0.071	0.399	0.839
D.No. 1021 Lead and its compounds Lead accumulators, foundry	63	13	0	1		82.5	0.036	0.157	0.18
D.No. 1022 Lead and its compounds Lead accumulators, mixing	5	3	0	1		80			
D.No. 1023 Lead and its compounds Lead accumulators, paste application	37	10	0	1		51.4	0.099	0.682	0.981
D.No. 1024 Lead and its compounds Lead accumulators, subsequent treat-ment of plates	48	10	0	1		50	0.095	1.4	2.04
D.No. 1025 Lead and its compounds Lead accumulators, installation	189	15	7 3.7	1	0.0013	65.1	0.0745	0.29	0.486
D.No. 1026 Lead and its compounds Lead accumulators, tubular plates	11	3	0	1		9.1	0.345	1.58	1.78

Appendix 3

Statistical evaluations for the assignment of work area and industry groups

Lead, sampling time ≥ 1 h and exposure time ≥ 6 h
Comparison of industry groups with work area groups

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
Work area group: „Conveying, storing“									
D.No. 354 Lead and its compounds Construction	Excavation of building pit; Cleaning of track beds; Railway construction	49	19	30 61.2	3	100	! a. q.	+ 0.0024	+ 0.0046
D.No. 358 Lead and its compounds Cleaning of buildings, Waste disposal	Waste incineration; Metal recycling (scrap); Recycling of electronic scrap; Waste collection, Cleaning of buildings, general	32	13	12 37.5	8	96.9	+ 0.0024	0.0492	0.0742
D.No. 342 Lead and its compounds Hollow glass and flat glass	Manufacture and processing of flat glass; Manufacture and processing of hollow/ pressed glass; Manufacture and processing of hollow glass	10	6	0	1	80	0.013	0.59	0.625
D.No. 341 Lead and its compounds Porcelain, Pottery	Manufacture of wall/floor tiles, stove tiles, structural ceramic	13	7	3 23.1	1	100	0.0032	0.023	0.036

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
Work area group: „Milling, Reducing, Classifying“									
D.No. 383 Lead and its compounds Waste disposal, Cleaning of buildings,	Recycling of electronic scrap	128	30	5 3.9	5	78.9	0.03	0.202	0.243
D.No. 381 Lead and its compounds Wholesale trade	Wholesale trade with waste materials (except scrap); Wholesale trade with scrap, shredder plants	11	4	0	1	100	0.018	0.0468	0.0517
D.No. 367 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and processing of hollow/ pressed glass	23	7	1 4.3	1	69.6	0.0375	0.314	0.371
D.No. 363 Lead and its compounds Plastics, processing and manufacture; Manufacture and processing of rubber products	Manufacture of plastic sheets, tubes and profiles; Plastics and plastic foam, processing	33	12	19 57.6	4	97	! a. q.	0.0138	0.0306
D.No. 366 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of special ceramic; Manufacture of sanitary, technical and chemical-technical electrical ceramic; Manufacture of porcelain and fine ceramic goods	25	8	4 16	2	72	0.023	0.67	0.755

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area group: „Mixing“									
D.No. 387 Lead and its compounds Chemical industry	Manufacture of abrasives and polishing agents, dry; Chemical industry	23	8	13 586.5	2	78.3	! a. q.	0.448	2.708
D.No. 392 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and process-ing of hollow glass; Manu-facture and processing of special glass; Manufacture and process-ing of hol-low/pressed glass	41	12	9 22	1	80.5	0.0155	0.262	0.506
D.No. 388 Lead and its compounds Plastics, processing and manufacture; Manufacture and processing of rubber products	Plastics and plastic foam, processing; Manufacture of plastic and plastic foam; Stabilisers containing lead, utilisa-tion	98	32	14 14.3	8	93.9	0.015	0.0612	0.132
D.No. 391 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of porcelain and fine ce-ramic goods; Manufacture of sanitary, technical and chemical-technical electrical ceramic	18	8	7 38.9	2	83.3	0.005	0.13	0.339
D.No. 389 Lead and its compounds Manufacture and treatment of friction lining (brake lining and clutch lining)	Friction lining	23	4	7 30.4	2	91.3	+ 0.0043	0.05	0.102

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area group: „Drying, sintering, roasting, smelting“									
D.No. 412 Lead and its compounds Chemical industry	Chemical industry; Manufacture of stabilisers containing lead for the plastics industry	17	5	1 5.9	2	64.7	0.06	0.264	0.404
D.No. 413 Lead and its compounds Plastics, processing and manufacture; Manufacture and processing of rubber products	Manufacture of plastic sheets, tubes and profiles; Plas-tics and plastic foam, process-ing	13	6	6 46.2	3	100	+ 0.0013	0.004	0.0151
D.No. 416 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of enamel; Manu-facture of sanitary, tech-nical and chemical-technical elec-trical ceramic; Manufacture of special ceramic	22	8	3 13.6	2	68.2	0.008	0.514	0.565
D.No. 426 Fine mechanics	Musical instru-ments; Hard-ware, sheet metal and metalware products	17	10	2 11.8	3	94.1	0.0135	0.0566	0.0852
D.No. 418 Lead and its compounds Blast furnace, Rolling mills	E steel works; Manufacture of non-ferrous metals (except lead); Sheet mill; Wire mill	70	19	2 2.9	5	87.1	0.018	0.16	0.565
D.No. 420 Lead and its compounds Foundry	Iron foundry; Heavy metal foundry; Non-ferrous metal foundry, mixed	105	38	8 7.6	7	86.7	0.035	0.135	0.17

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area group: „Drying, sintering, roasting, smelting“									
D.No. 422 Lead and its compounds Processing of metals	Drawing works, general; Proc-essing of met-als, general	71	22	8 11.3	8	76.1	0.027	0.208	0.892
D.No. 424 Lead and its compounds Electrical engineering	Electrical engineering, general	13	8	6 46.2	2	100	+ 0.00217	0.0149	0.0198
D.No. 417 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and processing of hollow glass; Manufacture and processing of flat glass	112	13	4 3.6	1	72.3	0.06	0.348	0.618
D.No. 419 Lead and its compounds Lead works	Lead works	35	4	0	2	42.9	0.12	0.31	0.323

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area group: „Processing“									
D.No. 438 Lead and its compounds Plastics, processing and manufacture; Manufacture and processing of rubber products	Plastics and plastic foam, processing; Manufacture of plastic sheets, tubes and profiles	12	8	7 58.3	4	91.7	! a. q.	0.0114	0.407
D.No. 445 Lead and its compounds Foundry	Heavy metal foundry; Non-ferrous metal foundry, mixed	73	23	5 6.8	5	80.8	0.0345	0.18	0.321
D.No. 446 Lead and its compounds Electroplating	Pot galvanis-ing plant; Electroplating; Surface treatment and hardening	16	13	4 25	5	87.5	0.002	0.0776	0.356
D.No. 447 Lead and its compounds Processing of metals	Processing of metals, gen-eral; Grinding shop (metal products)	107	53	43 40.2	8	87.9	+ 0.0024	0.133	0.179
D.No. 448 Lead and its compounds Metal construction and repair shops	Mechanical engineering; Apparatus engineering; Manufacture of taps and valves	51	19	25 49	6	94.1	+ 0.00145	0.0614	0.162
D.No. 452 Lead and its compounds Treatment of wood	Processing and treatment of wood	22	6	6 27.3	2	90.9	0.0043	0.0876	0.133
D.No. 454 Lead and its compounds Construction	General reno-vation; Blast-ing works and corrosion protection (on steel sur-faces); Corro-sion protec-tion, removal of old coatings	21	11	3 14.3	5	81	+ 0.00475	0.296	0.775

D.No. = Data set number/ Designation In Industry groups	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area group: „Processing“									
D.No. 455 Lead and its compounds Painting and varnishing	Painting and varnishing; Glazing work (construction and shop work)	22	9	0	5	77.3	0.023	0.306	0.718
D.No. 441 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of sanitary, technical and chemical-technical electrical ceramic; Manufacture of wall/floor tiles, stove tiles, structural ceramic; Manufacture of porcelain and fine ce-ramic goods	42	22	18 42.9	1	100	0.0028	0.0272	0.0594
D.No. 442 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and process-ing of hollow glass; Manu-facture and processing of flat glass	155	25	18 11.6	1	79.4	0.019	0.3	0.475

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area groups: „Filling, weighing“									
D.No. 462 Lead and its compounds Chemical industry	Manufacture of stabilisers containing lead for the plastics industry; Chemical industry	15	11	4 26.7	2	80	0.012	0.35	0.44
D.No. 463 Lead and its compounds Plastics, processing and manufacture; Manufacture and processing of rubber products	Manufacture and processing of rubber products; Manufacture of plastic and plastic foam; Stabilisers containing lead, utilisation	12	9	4 33.3	4	100	+ 0.0038	0.0856	0.0934
D.No. 466 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of porcelain and fine ceramic goods; Manufacture of wall/floor tiles, stove tiles, structural ceramic	38	17	6 15.8	2	92.1	0.0062	0.0696	0.158
D.No. 465 Lead and its compounds Stones, Earth, Sand, Precast concrete blocks	Manufacture of brick products	12	4	2 16.7	2	75	0.044	0.318	0.476
D.No. 473 Lead and its compounds Metal construction and repair shops	Mechanical engineering; Manufacture of solar technology	10	6	9 90	4	100	! a. q.	+ 0.0034	+ 0.005

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	≤ limit value % $	Concentrations in mg/m³		
							50 percentile *	90 percentile *	95 percentile *
Work area groups: „Cleaning, Repair, Inspection“									
D.No. 492 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and processing of flat glass; Manufacture and processing of hollow glass	16	10	5 31.3	1	81.3	0.0019	0.158	0.176
D.No. 499 Lead and its compounds Electrical engineering	Electrical engineering	25	15	18 72	1	100	! a. q.	0.0096	0.0125
D.No. 488 Lead and its compounds Plastics, processing and manufacture; Manufacture and processing of rubber products	Plastics and plastic foam, processing	15	8	4 26.7	3	93.3	+ 0.00455	0.024	0.142
D.No. 498 Lead and its compounds Metal construction and repair shops	Mechanical engineering; Shipbuilding; Manufacture of solar technology	26	11	11 42.3	4	92.3	+ 0.0024	0.0652	0.192
D.No. 508 Lead and its compounds Cleaning of buildings, Waste disposal	Waste incineration; Street cleaning; Recycling plants	25	13	9 36	5	92	+ 0.0005	0.0285	0.0902
D.No. 501 Lead and its compounds Fine mechanics	Fine mechanics, optics; Manufacture of ammunition	13	4	1 7.7	1	100	0.0225	0.0784	0.0857

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area groups: „Surface coating“									
D.No. 521 Lead and its compounds Electroplating	Surface treatment and hardening; Electroplating; Pot galvanising plant; Processing of liquid coating materials (liquid varnish coating)	81	37	44 54.3	6	90.1	! a. q.	0.0867	0.346
D.No. 522 Lead and its compounds Processing of metals	Drawing works, general; Processing of metals, general	47	17	21 44.7	6	91.5	+ 0.0022	0.0895	0.146
D.No. 523 Lead and its compounds Metal construction and repair shops	Manufacture of solar technology; Shipbuilding; Manufacture of machinery and vehicles, general	14	6	9 64.3	3	85.7	! a. q.	0.0972	0.714
D.No. 515 Lead and its compounds Stones, Earth, Sand, Precast concrete blocks	Manufacture of brick products	64	15	24 37.5	1	89.1	0.005	0.113	0.174

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area groups: „Surface coating“									
D.No. 516 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of porcelain and fine ceramic goods; Manufacture of pottery and earthenware; Manufacture of porcelain and crockery ceramic; Manufacture of wall/floor tiles, stove tiles, structural ceramic; Manufacture of sanitary, technical and chemical-technical electrical ceramic	276	74	110 39.9	1	95.3	+ 0.0026	0.058	0.0972
D.No. 517 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and processing of hollow glass	151	42	61 40.4	1	91.4	+ 0.0018	0.0868	0.279
D.No. 519 Lead and its compounds Lead works	Lead works	23	3	4 17.4	2	78.3	0.0375	0.169	0.241
D.No. 524 Lead and its compounds Electrical engineering	Electrical engineering	28	22	19 67.9	1	96.4	! a. q.	+ 0.006	0.0198

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of Alls*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area groups: „Firing range“									
D.No. 551 Lead and its compounds Fine mechanics	Manufacture of ammunition	18	3	1 5.6	1	72.2	0.025	0.246	0.357
D.No. 559 Lead and its compounds Sports association, Police	Police	108	16	20 18.5	3	73.1	0.0098	0.458	1.26
D.No. 560 Lead and its compounds Manufacture of weapons and ammunition	Manufacture of weapons and ammuni-tion	18	3	1 5.6	1	72.2	0.025	0.246	0.357
Work area groups: „Welding“									
D.No. 572 Lead and its compounds Processing of metals	Processing of metals, gen-eral; Manufac-ture of pipes, general; Drop forges	246	41	174 70.7	9	98.8	! a. q.	+ 0.0034	+ 0.0106
D.No. 573 Lead and its compounds Metal construction and repair shops	Shipbuilding; Steel con-struction; Plant engi-neering and construction, construction of plants; Appa-ratus engi-neering; Mechanical engineering	336	36	258 76.8	7	99.4	! a. q.	+ 0.0074	+ 0.0084
D.No. 579 Lead and its compounds Construction	Container construction; Plant and equipment construction (metal)	76	7	56 73.7	5	94.7	! a. q.	+ 0.0035	0.29

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area groups: „Soft soldering“									
D.No. 597 Lead and its compounds Processing of metals	Processing of metals, gen-eral	39	24	16 41	5	82.1	+ 0.002	0.212	0.413
D.No. 598 Lead and its compounds Metal construction and repair shops	Vehicle con-struction; Manufacture of aircraft; Manufacture of solar tech-nology; Appa-ratus engi-neering	58	16	35 60.3	4	75.9	! a. q.	0.582	0.929
D.No. 599 Lead and its compounds Electrical engineering	Electrical engineering	288	146	237 82.3	5	99.7	! a. q.	+ 0.0035	+ 0.0055
D.No. 601 Lead and its compounds Fine mechanics	Manufacture of musical instruments; Manufacture of electricity distribution systems; Manufacture of fine me-chanics, optics	19	9	6 31.6	2	100	+ 0.0037	0.0347	0.0604
D.No. 592 Lead and its compounds Hollow glass and flat glass, technical glass	Manufacture and process-ing of special glass; Manu-facture and processing of flat glass	38	13	10 26.3	1	89.5	+ 0.0033	0.07	0.132
D.No. 605 Lead and its compounds Painting and varnishing	Sign and glass painting; Glazing work (construction and shop work)	22	4	0	2	86.4	0.042	0.116	0.129

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
Work area groups: „Hard soldering“									
D.No. 622 Lead and its compounds Processing of metals	Processing of metals, gen-eral	27	12	10 37	5	70.4	+ 0.0017	0.353	0.601
D.No. 624 Lead and its compounds Electrical engineering	Electrical engineering	16	11	11 68.8	2	100	! a. q.	0.0106	0.0188
Work area groups: „Moulding“									
D.No. 645 Lead and its compounds Foundry	Non-ferrous metal foundry, mixed; Iron foundry	34	13	2 5.9	3	76.5	0.019	0.26	0.306
D.No. 642 Lead and its compounds Hollow glass and flat glass, technical glass	Hollow glass and flat glass	91	14	9 9.9	1	84.6	0.017	0.13	0.165
Work area groups: „Transport“									
D.No. 1057 Lead and its compounds Transport	Transport	29	4	6 20.7	2	82.8	0.0166	0.242	0.4
Work area groups: „Pressing, compacting“									
D.No. 1088 Lead and its compounds Manufacture and processing of plastics	Plastics and plastic foam, processing	11	7	8 72.7	4	100	! a. q.	0.02	0.0516
D.No. 1097 Lead and its compounds Processing of metals	Processing of metals, gen-eral	18	9	3 16.7	6	94.4	0.013	0.071	0.0951
D.No. 1089 Lead and its compounds Friction lining	Friction lining	21	3	6 28.6	1	100	+ 0.0041	0.0189	0.0276

D.No. = Data set number/ Designation **In Industry groups**	Focuses of branches of industry	Number of measured data	Number of firms	Frequency < number of values %	Number of AIIs*	≤ limit value % $	Concentrations in mg/m³		
							50 per-centile *	90 per-centile *	95 per-centile *
D.No. 1091 Lead and its compounds Porcelain, Pottery, Sanitary, Tiles	Manufacture of sanitary, technical and chemical-technical electrical ceramic	18	6	5 27.8	1	77.8	0.061	0.286	0.52
K.Nr 1092 Lead and its compounds Hollow glass and flat glass; technical glass	Manufacture of special ceramic	21	7	2 9.5	1	95.2	0.03	0.0808	0.0991
D.No. 1099 Lead and its compounds Electrical engineering	Electrical engineering	14	8	3 21.4	1	92.9	+ 0.015	0.0736	0.116