

Results of the year 2006 (in $\mu\text{g}/\text{m}^3$)

- number of exceedances (limit value GW + tolerancevalue) / maximal value in $\mu\text{g}/\text{m}^3$

	SO ₂ 1 hr	SO ₂ 24 hrs	NO ₂ 1 hr	PM10 24 hrs	CO 8 hrs	O ₃ 8 hrs	O ₃ 1 hr
number of allowed exceedances	24	3	18	35	none	25	none
limit value (+tolerance value TM 2006)	350	125	200 (+40)	50	10000	120	180
background- and ozone stations							
Bergedorf	- / 99	- / 22	- / 98	15 / 107	-	-	-
Billbrook	- / 103	- / 36	- / 160	21 / 132	-	-	-
Billstedt	- / 111	- / 37	- / 170	26 / 127	-	-	-
Blankenese	- / 84	- / 35	- / 107	-	-	22 / 190	10 / 213
Bramfeld	- / 64	- / 19	- / 99	-	-	22 / 190	7 / 200
Finkenwerder Airbus	-	-	- / 129	-	-	-	-
Finkenwerder West	-	-	- / 152	25 / 124	-	-	-
Flughafen-Nord	- / 44	- / 16	- / 147	17 / 106	- / 1299	11 / 169	1 / 186
Neugraben	- / 94	- / 24	- / 100	-	-	21 / 188	9 / 211
Sternschanze	- / 92	- / 39	- / 137	31 / 104	- / 1274	9 / 171	3 / 197
Tatenberg	- / 73	- / 19	- / 102	19 / 127	-	14 / 171	2 / 195
Veddel	1 / 378	- / 102	- / 208	24 / 136	- / 2264	-	-
Wilhelmsburg	- / 171	- / 38	- / 204	18 / 131	-	-	-
traffic stations							
Habichtstr.	-	-	5 / 260	45 / 118	- / 2883	-	-
Kieler Straße	-	-	- / 205	-	- / 2942	-	-
Max-Brauer-Allee	- / 146	- / 37	- / 192	36 / 120	- / 2620	-	-
Stresemannstraße	- / 107	- / 38	2 / 258	35 / 135	- / 2316	-	-

Informations about concentrations of the pollutants are published in

- Teletext NDR plate 191 (summer)
plates 191 - 192 (winter)
- Vocal announcement phone 428 45 - 2424
- Internet www.hamburger-luft.de

published by:

Freie und Hansestadt Hamburg
Behörde für Soziales, Familie, Gesundheit und Verbraucherschutz

Institut für Hygiene und Umwelt
Bereich Umweltuntersuchungen / Luft
Automatische Immissionsmessungen
Marckmannstraße 129b
20539 Hamburg
E-Mail: luftmessnetz@hu.hamburg.de
Internet: <http://www.hu.hamburg.de>

Report HU431-07-03
Juni 2007

The Institute for Hygiene and Environment is part of the Hamburg Ministry for Welfare, Family, Health and Customer Protection. In the areas of food chemistry, human- and veterinary medicine and environmental analysis 360 people – scientists, medical and veterinary surgeons, veterinarians, engineers, technicians and administrative staff – work daily for the observation of the environment in order to prevent damage to the public, animals and nature, to protect customers against unsatisfactory products and to ensure public health.



The ambient air pollution network of Hamburg (HaLm)
Results of the year 2006



Institut für Hygiene und Umwelt
Hamburger Landesinstitut für Lebensmittelsicherheit
Gesundheitsschutz und Umweltuntersuchungen



Air pollution in Hamburg

In the year 2006, high concentrations of aerosol particles smaller than 10 µm (PM10) and of ozone were measured in the City of Hamburg. Although the annual mean of PM10 at all stations was lower than the annual mean limit value of 40 µg/m³, the daily mean value of 50 µg/m³ was exceeded more than 35 times (number of allowed exceedances per year) at two traffic stations. At the traffic station Habichtstraße, 45 exceedances and at Max-Brauer-Allee, 36 exceedances were documented. Also at the other network stations there were more exceedances documented in 2006 than in 2005. The extreme weather conditions at the beginning of the year were responsible for a large number of higher particle concentrations. The high pressure systems favoured cold and stagnant weather conditions with inversions. This led to an accumulation of pollutants. At the same time the cold weather led to more emissions caused by domestic heating. The large scale background concentration was therefore higher than during a warmer winter. In addition, local emissions from traffic and/or dust intensive building activities influenced the measurements at several stations. In connection with the PM10 pollution in the city of Hamburg an action plan was already developed in 2004.

There were several ozone episodes during the summer months. On 4 days the ozone information value of 180 µg/m³ was exceeded, leading to an information of the public. This number was surprisingly high since the ozone information value had not been exceeded since 2003. Intensive ozone formation is dependent on strong sun radiation, high temperatures and high precursor concentrations (e.g. NO, NO₂ and hydrocarbons) in the air.

Another pollutant which influences the air quality of Hamburg very much is nitrogen dioxide (NO₂). The annual limit value of 40 µg/m³ is due to come into force from 1.1.2010, but until then this limit value plus an annually decreasing tolerance value (TM) (in 2006 it was 48 µg/m³) should not be exceeded. However, it was exceeded at all four traffic stations, the highest NO₂ pollution was measured at the Max-Brauer-Allee with 73 µg/m³. At the Habichtstraße und Stresemannstraße even the limit value + TM (240 µg/m³ in 2006) for one hour was several times exceeded.

Further measures will have to be considered in order to fulfil the requirements of the Air Quality Framework Directive and its Daughter Directives, especially in regard to staying below the limit values in 2010. Therefore the local Ministry for City Development and Environment prepared an action plan for the City of Hamburg.

The annual limit value of 5 µg/m³ for benzene which also will be valid from 2010 can already be met, even at the traffic stations. Although there have been short periods of high ozone and PM10 concentrations, the air quality of Hamburg was in general good in 2006.

The ambient air pollution network of Hamburg

- has at the moment 18 measurement stations and one mobile truck for checking the air quality in Hamburg (measurements for the 18th station - Billwerder - were only started in December 2006)
- differentiates between background-, ozone- and traffic-stations
- measures continuously according to EU- Directives and national law (Bundes-Immissionsschutzgesetz)

The background-stations monitor the general air quality in a larger area. They measure sulphur dioxide (SO₂), nitrogen monoxide (NO), nitrogen dioxide (NO₂) and particulate matter (PM10: particle smaller than 10 micrometer). Some stations also measure carbon monoxide (CO). The ozone stations measure ozone (O₃) and also the NO₂- und NO-concentrations. At the traffic-stations pollutants are monitored which are typical for traffic locations: benzene, NO, NO₂, CO and diesel soot.

Last but not least the instruments in a mobile truck measure pollutants in locations which are placed in a 500 by 500 m grid in order to document the air quality in a smaller scale. Alternatively, the equipment is used for screening measurements.

The table considers not only limit values of the EU but also the annual mean value for SO₂ (from the TALuft).

* limit value of the TALuft

** annual mean values, which are based on less than 85% of the theoretical possible values

Results of the year 2006 (in µg/m³)

annual mean values	SO ₂	NO	NO ₂	O ₃	PM 10	CO	Ben-zene	PM 2,5	soot
	JM	JM	JM	JM	JM	JM	JM	JM	
limit value(+TM)	50*	-	40 (+8)	-	40	-	5 (+4)	-	
background- and ozone- stations									
Bergedorf	4	6	23	-	22	-	-	-	-
Billbrook	6	12	32	-	23	-	-	-	-
Billstedt	5	16	34	-	29	-	-	-	-
Blankenese	6	4	19	47	-	-	-	-	-
Bramfeld	3	5	19	45	-	-	-	-	-
Finkenwerder Airbus	-	9	23	-	-	-	-	-	-
Finkenwerder West	-	7	24	-	29	-	-	-	-
Flughafen-Nord	3	9	25	40	22	265	0,8	-	-
Neugraben	4	5	19	49	-	-	-	-	-
Sternschanze	7	10	33	39	29	265	0,9	16	-
Tatenberg	4	4	20	44	21	-	0,7	16	-
Veddel	11	22	39	-	27	305	-	19	-
Wilhelmsburg	8	10	31	-	23	-	-	-	-
traffic stations									
Habichtstraße	-	82	68	-	36	796	2,7	-	-
Kieler Straße	-	69	62	-	-	548	1,9	-	7
Max-Brauer-Allee	9	75	73	-	33	761	2,8	-	5
Stresemannstr.	8	59	67	-	31	532	1,9**	-	4**