

THE REGULATION
ON ENVIRONMENTAL PROTECTION APPLIED TO UNITS
IN HIEP PHUOC INDUSTRIAL PARK
(Adjustment for the 2nd time on 23 March 2016)

CHAPTER I
GENERAL PROVISIONS

Article 1. Legal ground:

- 1- Law on Environmental Protection No.55/2014/QH13 dated 23 Jun 2014;
- 2- The Decree No.29/2008/NĐ-CP dated 14/03/2008 of the Government issuing regulations on industrial zones, export processing zones and economic zones;
- 3- The Decree No.25/2013/NĐ-CP dated 29/03/2013 of the Government issuing regulations on environmental protection fee for wastewater;
- 4- The Decree No.179/2013/NĐ-CP dated 14/11/2013 of the Government issuing regulations on handling law violations in the environment field;
- 5- The Decree No.80/2014/NĐ-CP dated 06/08/2014 of the Government issuing regulations on water drainage and wastewater treatment;
- 6- The Decree No.18/2015/NĐ-CP dated 14/02/2015 of the Government issuing regulations on environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental protection plans;
- 7- The Decree No.19/2015/NĐ-CP dated 14/02/2015 of the Government detailing the implementation of some articles of the Law on Environmental Protection;
- 8- The Decree No.38/2015/NĐ-CP dated 24/04/2015 of the Government issuing regulations on waste and scrap management;
- 9- The Circular No.16/2009/TT-BTNMT dated 07/10/2009 of the Ministry of Natural Resources and Environment issuing regulations on national technical regulations on environment (promulgated together with the national technical regulations on environment: QCVN 06:2009/BTNMT - the national technical regulations on some toxic substances in the surrounding atmosphere).
- 10- The Circular No.25/2009/TT_BTNMT dated 16/11/2009 of the Ministry of Natural Resources and Environment issuing regulations on national technical regulations on environment (promulgated together with the national technical regulations on environment: QCVN 19:2009/BTNMT - the national technical regulations on industrial emission of dust and inorganic substances; QCVN 20:2009/BTNMT - the national technical regulations on industrial emission of some organic substances).
- 11- The Circular No.36/2015/TT BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment issuing regulations on management of hazardous wastes;
- 12- The Circular No.47/2011/TT__BTNMT dated 28/12/2011 of the Ministry of Natural Resources and Environment issuing regulations on national technical regulations on environment (to be promulgated together with the national technical regulations on environment: QCVN 40:2011/BTNMT - the national

technical regulations on industrial wastewater).

- 13- Circular No.32/2013/TT-BTNMT dated 25/10/2013 of the Ministry of Natural Resources and Environment issuing regulations on national technical regulations on environment (to be promulgated together with the national technical regulations on environment: QCVN 50:2013/BTNMT- the national technical regulations on Hazardous Thresholds for Sludge from Water Treatment Process).
- 14- Circular No.26/2015/TT-BTNMT dated 28/05/2015 of the Ministry of Natural Resources and Environment issuing regulations on detailed environmental protection project and simple environmental protection project;
- 15- Circular No.27/2015/TT-BTNMT dated 29/05/2015 of the Ministry of Natural Resources and Environment issuing regulations on strategic environmental assessment, environmental impact assessment and environmental protection plans;
- 16- Circular No.35/2015/TT-BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment issuing regulations on environmental protection in economic zones, industrial zones, export processing zones and hi-tech zones;
- 17- Decision No.04/2008/QĐ-BTNMT dated 18/07/2008 of the Ministry of Natural Resources and Environment providing for issuance of national technical regulations on environment (to be promulgated together with the national technical regulations on environment: QCVN 03:2008/BTNMT - the national technical regulations on permitted limit of heavy metal in soil).
- 18- Decision No.16/2008/QĐ-BTNMT dated 31/12/2008 of the Ministry of Natural Resources and Environment providing for issuance of national technical regulations on environment (to be promulgated together with the national technical regulations on environment: QCVN 08:2008/BTNMT - the national technical regulations on surface water quality; QCVN 14:2008/BTNMT- the national technical regulations on domestic wastewater).
- 19- Decision No.1653/QĐ-MTg dated 06/08/1996 of Ministry of Science, Technology and Environment providing for approval of environmental impact assessment report of the Hiep Phuoc central industrial park project;
- 20- Decision No.2519/QĐ-BTNMT dated 02/12/2008 of the Ministry of Natural Resources and Environment regarding approval of environmental impact assessment report of the project “Investment in construction and trading infrastructure of Hiep Phuoc Industrial Park – second stage”;
- 21- The Decision No.17/2006/QĐ-UBND dated 09/02/2006 of HCMC People’s Committee regarding issuance of regulations on management of water resource in HCMC;
- 22- The Decision No.69/2007/QĐ-UBND dated 03/05/2007 of HCMC People’s Committee regarding issuance of regulations on reducing and banning underground water exploitation in HCMC;
- 23- The Decision No.44/2015/QĐ-UBND dated 09/09/2015 of HCMC People’s Committee regarding issuance of regulations on management of sludge in HCMC;

Article 2. This regulation stipulates unified management related to environmental protection for units in order to protect the environment, guaranteeing sustainable development of units in Hiep Phuoc Industrial Park.

Article 3. Definition of terms:

- “Units”: applied in this Regulation including organizations, individuals, companies, businesses,

factories, plants, production and business or services facilities, construction contractors, service suppliers, sub-lessees of land and workshops in Hiep Phuoc Industrial Park;

- “Land lot”: is area of land leased according to the land sublease contract signed between Hiep Phuoc Industrial Park JSC and a business;

- “HEPZA”: Ho Chi Minh City Export Processing and Industrial Zones Authority;

- “HIPC”: Hiep Phuoc Industrial Park Joint Stock Company

Article 4. This regulation is applied to all units in Hiep Phuoc Industrial Park in order to prevent and reduce negative impacts on the environment, making sure that discharge levels from activities of the units shall not exceed applicable standards and regulations on environmental protection.

Article 5. This regulation is considered as a legal basis and an indispensable part of the land sublease contract in Hiep Phuoc Industrial Park (IP).

Chapter II

CONSTRUCTION PREPARATION STAGE

Article 6. The units must explain about documents related to environmental impact assessment report or environmental protection plans as regulated to competent levels for approval. The units must undertake that they comply with environmental standards during operation period of the project (Section 1, Table 1 Appendix part).

Article 7. Planning and technical design of the above units shall observe regulations on construction management in Hiep Phuoc IP, meeting the following requirements:

- 1- Design and layout of factory plan follow the project for minimizing environmental impacts as committed in the environmental license (Environmental impact assessment report or environmental protection plans) which have been approved or are expected to submit to competent agencies for approval;
- 2- Greenery area must be suitable with regulations on construction management in Hiep Phuoc IP;
- 3- Separate the rainwater drainage system from the local wastewater drainage system in course of construction, ensuring the local water drainage system is connected properly and completely to the shared water drainage system in Hiep Phuoc IP;
- 4- The wastewater and rainwater drainage system of plants before connecting to the shared water drainage system in Hiep Phuoc IP must go through test manholes (for the wastewater drainage system, there’s only 1 test manhole) built outside of plants’ fencing wall with size according to regulations to ensure works including water survey and sampling for testing water quality.
- 5- Plants’ local wastewater drainage system shall be designed to treat all arising wastewater including production and domestic wastewater at the stage of stable operation and for provision in times when plants increase capacity or in case of environmental incidents;
- 6- It is required to design areas for storage and classification of arising wastes (including hazardous wastes, industrial wastes, scraps and domestic wastes) with fencing walls, roofs, labels, signs for warning prevention of water from such waste from penetrating into soil; classification of wastes at source, avoiding mixing domestic wastes with hazardous wastes and vice versa;
- 7- Make sure the local emission treatment system is able to treat all emission of plants according to current regulations. There must be a drill hole on the chimney to sample emission with diameter >10 mm at part of the chimney that has unchanged section;

- 8- It is required to design and build the system for collection and treatment of all odor and dust discharged from the process of production, transportation and storage of materials, goods, ensuring treatment of the same according to current standards;
- 9- Factories must maintain safe distance related to fire prevention and fighting safety, safe isolation, besides, take sound isolation, foundation treatment solutions in order to reduce noise and vibration levels not to affect surrounding areas.

Chapter III

CONSTRUCTION STAGE

Section 1

CONSTRUCTION CONTRACTOR'S RESPONSIBILITY

Article 8. Observe provisions on construction management in Hiep Phuoc IP that are approved by functional bodies.

Article 9. Units participating in construction must arrange an area for storage of wastes and sign a waste collection contract with functional units; build toilets for workers inside the land lot of the investor as soon as starting the construction process; arrange temporary tents, supplies warehouse, water drainage system on the area of the land lot approved by HIPC.

Article 10. Units participating in construction must guard the construction site by temporary steel framed fences, stainless steel walls with height of at least 2 meters, ensuring structural safety, protecting against leaning & collapse, being swept away by winds, guaranteeing safety for humans, landscape and fire & explosion safety.

Article 11. Observe regulations on labor safety and environmental sanitation; don't let smoke, dust, wastewater, noise affect surrounding areas.

Article 12. All activities are conducted on the area of the land lot only; burying and throwing away wastes that doesn't conform to regulations on environmental protection is strictly prohibited. HIPC shall offer directions on releasing construction wastes in designated areas.

Article 13. Contractors who are in breach of above regulations must quickly remedy damages caused by them within the time limit set by HIPC. Upon expiry of such period of time, if such contractors fail to remedy the said damages, HIPC shall take remediation measures using "the construction deposit"; in case of serious damages, HIPC shall suspend the execution, ban vehicles from getting access to the industrial park.

Section 2

INVESTOR'S RESPONSIBILITY

Article 14. Investors shall build factories according to construction permits. They have to work with and create favorable conditions for agencies on environmental protection to conduct supervision and testing activities; fully provide related information and data when required.

Article 15. Send a written notice to HIPC specifying information about construction contractors, construction duration, date of completion and putting into operation.

Article 16. Provide close supervision and be responsible for compliance with environmental protection regulations of construction contractors during the factory construction period.

Article 17. Conduct environmental surveys, make reports as regulated and notify HIPC and functional bodies of the survey results as regulated (Section 2, Table 1 in Appendix part).

Article 18. Cooperate with HIPC to conduct acceptance of current plan of the land lot after completing all construction items and issue a written notice of infrastructure connection for being instructed as regulated.

Chapter IV

OPERATION STAGE

Article 19. All activities are conducted on the area of the land lot only; burying and discharging wastes that doesn't conform to regulations on environmental protection is strictly prohibited.

Article 20. The units are only put into operation when meeting the following conditions:

- 1- Greenery area must be complied with current regulations;
- 2- Separate the rainwater drainage system from the wastewater drainage system has been completed; the wastewater drainage system is connected to the wastewater collection system in Hiep Phuoc IP at only one point;
- 3- The water drainage system has been accepted by HIPC as being connected to the infrastructure of the industrial park;
- 4- Systems for treatment of wastewater, emission, dust and odor have been built based on unique characteristics of specific industries and put into operation according to approved environmental impact assessment report, environmental protection commitments or environmental protection plans;
- 5- Documents confirming completion of environmental protection works which serve operation of large and likely to cause negative impacts on the environment projects;
- 6- Operation of wastewater treatment works must be fully recorded on a daily basis and maintained for later check and inspection. The logs of operation include: wastewater levels, consumed electricity levels, used chemical levels, sludge levels;
- 7- Locations and warehouses have been in place for temporary storage of materials; make sure solid wastes are classified at source and stored in a way that ensures observing sanitation regulations and safety for the environment;
- 8- Sign contracts with functional units to collect, transport and treat domestic, industrial and hazardous wastes; there are documents proving transfer of various wastes. Burying wastes and releasing wastes into the environment is strictly banned;
- 9- Have personnel being in charge of environmental protection.

Article 21. Environmental treatment systems of the units must undergo trial runs to test technical and environmental parameters designed (such trial runs must be conducted within 6 months since completion of the systems); trial run plans must be informed to functional bodies and HIPC for inspection and supervision. After completion of the trial runs, written reports must be submitted to relevant units and request functional bodies to check, measure and confirm completion of the environmental treatment systems.

Article 22. Wastewater treatment by the units must meet the standards accepted by HIPC, then HIPC shall collect and treat wastewater at value C in column B of the QCVN 40:2011/BTNMT with $k_f = 0.9$, $k_q = 0.9$ before discharging it into the environment; the units must pay wastewater treatment fees to HIPC (as agreed according to wastewater treatment contracts). HIPC shall consider separate agreements for each specific case according to HIPC's receiving and treatment capacity.

Article 23. The units must inform and immediately explain to HIPC in case of occurrence of environmental incidents; temporarily stop and immediately remedy the stage where an environmental incident occurs. In case of a

serious incident, immediately suspend the arising production stage to completely remedy such incident.

Article 24. During operation, if there is any change to scale or a technological innovation, the units must promptly report to HEPZA and inform HIPC to receive additional instructions on legal procedures related to the environment.

Article 25. The units are responsible for managing hazardous wastes (formulating documents to apply for registry of being a source of hazardous wastes, storage of wastes, transfer of wastes, etc.) according to current regulations (Section 3, Table 1 Appendix part).

Article 26. The units are responsible for conducting environmental surveys and making reports as regulated and provide the survey results for HIPC and functional bodies. Additionally, they are legally responsible for figures in such reports. Number of times conducting environmental surveys must comply with the approved environmental license.

Article 27. The units must quickly remedy environmental pollution issues caused by their facilities. If the units fail to take remediation within the permitted duration, HIPC shall stop supplying clean water, receiving wastewater and ban vehicles from getting access to the industrial park as well as request competent agencies to handle according to applicable laws.

Article 28. The units who already come into operation shall confirm environmental management systems that generate large volume of wastes, have risk of causing serious impacts on the environment (Section 4, Table 1 Appendix part).

Chapter V

REGULATIONS AND STANDARDS THAT MUST BE APPLIED

Article 29. Solid waste (Section 5, Table 1 of the Appendix part):

- 1- The units must make area planning for classification and temporary storage of domestic solid wastes, industrial wastes and hazardous wastes. The entire process must be conducted inside the plant's fence and guaranteed that outside environment shall not be affected;
- 2- Hazardous wastes shall be managed according to current laws;
- 3- Make reports on management of hazardous wastes and submit them to HCMC Department of Natural Resources and Environment as regulated.

Article 30. Air (Tables 2, 3 & 4 of the Appendix part)

- 1- Regulations on emission must be observed;
- 2- It is required to build control plans and emission treatment systems that satisfy allowed regulations before discharging; it is necessary to modernize equipment and complete technological processes in order to minimize emission levels;
- 3- Strictly control odor arising from the production line to avoid odor from being dispersed into the surrounding environment.

Article 31. Wastewater (Tables 5 & 6 of the Appendix part)

- 1- Wastewater (including production wastewater and domestic wastewater) released by each plant must be collected and led to the local treatment system of each plant for treatment, prohibit direct discharge wastewater into the environment in any way that may affect the surrounding environment.
- 2- Before being connected to the industrial park's shared wastewater drainage system, wastewater must be

treated locally so as not to exceed parameter and concentration limits of pollutants present in wastewater based on the standards on receiving wastewater by HIPC;

- 3- Wastewater treatment by letting it penetrate into soil or dilute wastewater using clean water (supplied water serving domestic needs) to reach permitted limits is strictly prohibited.

Article 32. Noise and vibration (Tables 7 & 8 of the Appendix part)

Regulations on noise, vibration and shock levels caused by construction and production activities must be observed; it is necessary to modernize equipment and improve technological processes in order to minimize noise and vibration levels at source.

Article 33. Importation, exportation, storage and transportation of radioactive substances, sources of ionizing radiation, toxic substances, flammable and explosive substances must conform to current provisions.

Article 34. Surface water (river/channel/canal water)

- 1- Surface water users are required to obtain surface water exploitation licenses issued by competent agencies;
- 2- They shall report exploited and used surface water flow to HCMC Department of Natural Resources and Environment and HIPC once every 6 months.
- 3- Ban waterways transport means from releasing wastewater and ballast water that has not been treated according to the national technical regulations on the environment and solid waste into onshore waters of the industrial park.

Article 35. Prohibit underground exploitation activities in any way.

Chapter VI

CHECK AND INSPECTION

Article 36. In course of construction of factories, construction contractors must protect the environment, be subject to periodic or irregular environmental inspections and supervision by competent levels and professional departments of the industrial park.

Article 37. Production, business activities and services of the units must observe environmental protection measures as committed in the environmental impact assessment reports (or the environmental protection commitments/registrations of satisfying the environmental standards/environmental protection plans); and conform to policies related to regular, periodic or irregular environmental inspections and controls by competent levels to protect the environment.

Article 38. The units that violate regulations on environmental protection shall strictly implement requirements of Inspection/Check Delegation as soon as possible.

Chapter VII

HANDLING VIOLATION CASES

Article 39. For the units that are in breach of this Regulation, HIPC shall conduct checks and remind them by formulating warning documents, requiring them to take remediation within a specific duration and to pay for all costs related to environmental quality analysis (if applicable). Upon expiry of the permitted duration, if the violating units fail to take effective measures to remedy the violations, HIPC shall propose the same to competent agencies for handling violations in the environmental protection field in accordance with current laws.

Article 40. For the units that have been subject to administrative penalties, upon expiry of the administrative penalty duration, if they fail to take effective measures to remedy the violations as required by competent agencies,

HIPC shall temporarily stop supplying services such as clean water and stop receiving wastewater as regulated.

Article 41. In course of operation, the units are entitled to make claims and denounce when they detect acts that cause environmental pollution by other units and immediately report to HIPC for timely checking the site and taking remediation.

Article 42. The party causing environmental pollution must pay for all costs, remedy environmental issues and compensate for damages to the affected party after there is an official conclusion from competent agencies about pollution levels.

Chapter VIII

IMPLEMENTATION

Article 43. This regulation shall come into force 15 days since the signing date.

Article 44. This regulation replaces the environmental protection regulation applied to units in Hiep Phuoc Industrial Park adjusted for the 1st time on 14 November 2011.

Article 45. This regulation is regarded as a legal ground in environmental protection field in Hiep Phuoc Industrial Park. Regarding cases that are not mentioned in this Regulation, they shall be adjusted based on current regulations and specific conditions in Hiep Phuoc Industrial Park.

Article 46. Organizations, individuals, companies, businesses, factories, plants, production and business facilities, services, sub-lessees of land, construction contractors in Hiep Phuoc Industrial Park and offices/departments in the Hiep Phuoc Industrial Park JSC shall implement this Regulation.

Ho Chi Minh City, 23 March 2016
HIEP PHUOC INDUSTRIAL PARK JSC
GENERAL DIRECTOR
(signed and sealed)
Vuong Huu Man

APPENDIX

I. GUIDANCE ON IMPLEMENTATION OF SOME ARTICLES

TABLE 1 GUIDANCE ON IMPLEMENTATION OF SOME ARTICLES

| Section | ARTICLES, CLAUSES | DOCUMENT NAME |
|---------|----------------------|---|
| 1 | Article 6 | Appendix 2, Decree No. 18/2015/NĐ-CP dated 14/02/2015 of the Government issuing regulations on environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental protection plans; |
| 2 | Article 17 | Clause 3, Article 16 Circular No. 35/2015/TT-BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment issuing regulations on environmental protection in economic zones, industrial zones, export processing zones and hi-tech zones |
| 3 | Article 25 | Article 5 to Article 14 Circular No. 36/2015/TT-BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment providing for hazardous waste management |
| 4 | Article 28 | Appendix II, Decree No. 19/2015/NĐ-CP dated 14/02/2015 of the Government detailing the implementation of some articles of Law on Environmental Protection |
| 5 | Clause 1, Article 29 | Chapters II, III, IV of the Decree No. 18/2015/NĐ-CP dated 24/04/2015 of the Government providing for management of waste and scraps and Article 5 to Article 14 Circular No. 36/2015/TT-BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment providing for hazardous waste management |
| | Clause 2, Article 29 | Article 5 to Article 14 Circular No. 36/2015/TT-BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment providing for hazardous waste management |
| | Clause 3, Article 29 | Clause 6 Article 7 Circular No. 36/2015/TT-BTNMT dated 30/06/2015 of the Ministry of Natural Resources and Environment providing for hazardous waste management |
| 6 | Article 39 | Decree No. 179/2013/NĐ-CP dated 14/11/2013 of the Government regarding handling violations in the environmental field |
| 7 | Article 40 | Clause 2, Article 28 Decree No. 80/2014/NĐ-CP dated 06/08/2014 of the Government providing for water drainage and wastewater treatment |

II. ENVIRONMENTAL REGULATIONS AND STANDARDS

**TABLE 2. NATIONAL TECHNICAL REGULATIONS ON INDUSTRIAL EMISSION
FOR DUST AND INORGANIC SUBSTANCES
QCVN 19:2009/BTNMT**

Permitted maximum concentration of dust and inorganic substances in industrial emission is calculated according to the following formula:

$$C_{max} = C \times K_p \times K_v$$

In which:

- C_{max} is permitted maximum concentration of dust and inorganic substances in industrial emission, measured by miligram per standard cubic meter of emission (mg/Nm³);
- K_p is the coefficient of emission flow:

| Emission flow (m ³ /h) | Coefficient K _p |
|-----------------------------------|----------------------------|
| P ≤ 20,000 | 1 |
| 20,000 < p ≤ 100,000 | 0.9 |
| P > 100,000 | 0.8 |

- K_v is regional coefficient (Type 3: industrial park, K_v = 1)
- C is concentration of dust and inorganic substances

❖ Concentration of dust and inorganic substances used as a basis for calculation of their permitted maximum concentration in emission is indicated in the table below

| S.N. | Parameters | Concentration C (mg/Nm ³) | |
|------|--|---------------------------------------|------|
| | | A | B |
| 1 | Total dust | 400 | 200 |
| 2 | Dust containing silicon | 50 | 50 |
| 3 | Ammonia and ammonium compounds | 76 | 50 |
| 4 | Antimony and compounds, calculating according to Sb | 20 | 10 |
| 5 | Arsenic and compounds, calculating according to As | 20 | 10 |
| 6 | Cadmium and compounds, calculating according to Cd | 20 | 5 |
| 7 | Lead and compounds, calculating according to Pb | 10 | 5 |
| 8 | Carbon monoxide, CO | 1000 | 1000 |
| 9 | Chlorine | 32 | 10 |
| 10 | Copper and compounds, calculating according to Cu | 20 | 10 |
| 11 | Zinc and compounds, calculating according to Zn | 30 | 30 |
| 12 | Hydrochloric acid, HCl | 200 | 50 |
| 13 | Fluorine, HF, or inorganic compounds of Fluorine, calculating according to HF | 50 | 20 |
| 14 | Hydrogen sulfide, H ₂ S | 7.5 | 7.5 |
| 15 | Sulfur dioxide, SO ₂ | 1500 | 500 |
| 16 | Nitrogen oxide, NO _x (calculating according to NO ₂) | 1000 | 850 |
| 17 | Nitrogen oxide, NO _x (chemical production facility), calculating according to NO ₂ | 2000 | 1000 |
| 18 | H ₂ SO ₄ or SO ₃ steam, calculating according to SO ₃ | 100 | 50 |
| 19 | HNO ₃ steam (other sources), calculating according to NO ₂ | 1000 | 500 |

**TABLE 3. NATIONAL TECHNICAL REGULATIONS ON INDUSTRIAL EMISSION
FOR SOME ORGANIC SUBSTANCES
QCVN 20:2009/BTNMT**

| S.N. | Name | CAS No. | Chemical formula | Maximum concentration (mg/Nm ³) |
|------|----------------------|------------|---|---|
| 1 | Axetylen tetrabromua | 79-27-6 | CHBr ₂ CHBr ₂ | 14 |
| 2 | Axetaldehyt | 75-07-0 | CH ₃ CHO | 270 |
| 3 | Acrolein | 107-02-8 | CH ₂ =CHCHO | 2.5 |
| 4 | Amylaxetat | 628-63-7 | CH ₃ COOC ₅ H ₁₁ | 525 |
| 5 | Anilin | 62-53-3 | C ₆ H ₅ NH ₂ | 19 |
| 6 | Benzidin | 92-87-5 | NH ₂ C ₆ H ₄ C ₆ H ₄ NH ₂ | KPHĐ |
| 7 | Benzen | 71-43-2 | C ₆ H ₆ | 5 |
| 8 | Benzyl clorua | 100-44-7 | C ₆ H ₅ CH ₂ Cl | 5 |
| 9 | 1,3-Butadien | 106-99-0 | C ₄ H ₆ | 2200 |
| 10 | n-Butyl axetat | 123-86-4 | CH ₃ COOC ₄ H ₉ | 950 |
| 11 | Butylamin | 109-73-9 | CH ₃ (CH ₂) ₂ CH ₂ NH ₂ | 15 |
| 12 | Creson | 1319-77-3 | CH ₃ C ₆ H ₄ OH | 22 |
| 13 | Clorbenzen | 108-90-7 | C ₆ H ₅ Cl | 350 |
| 14 | Clorofòm | 67-66-3 | CHCl ₃ | 240 |
| 15 | B-clopren | 126-99-8 | CH ₂ =CClCH=CH ₂ | 90 |
| 16 | Clopicrin | 76-06-2 | CCl ₃ N ₂ O | 0,7 |
| 17 | Cyclohexan | 110-82-7 | C ₆ H ₁₂ | 1300 |
| 18 | Cyclohexanol | 108-93-0 | C ₆ H ₁₁ OH | 410 |
| 19 | Cyclohexanon | 108-94-1 | C ₆ H ₁₀ O | 400 |
| 20 | Cyclohexen | 110-83-8 | C ₆ H ₁₀ | 1350 |
| 21 | Dietylamin | 109-89-7 | (C ₂ H ₅) ₂ NH | 75 |
| 22 | Diílodibrommetan | 75-61-6 | CF ₂ Br ₂ | 860 |
| 23 | o-diclobenzen | 95-50-1 | C ₆ H ₄ Cl ₂ | 300 |
| 24 | 1,1-Dicloetan | 75-34-3 | CHCl ₂ CH ₃ | 400 |
| 25 | 1,2-Dicloetylen | 540-59-0 | ClCH=CHCl | 790 |
| 26 | 1,4-Dioxan | 123-91-1 | C ₄ H ₈ O ₂ | 360 |
| 27 | Dimetylanilin | 121-69-7 | C ₆ H ₅ N(CH ₃) ₂ | 25 |
| 28 | Dicloetyl ete | 111-44-4 | (ClCH ₂ CH ₂) ₂ O | 90 |
| 29 | Dimetylformamit | 68-12-2 | (CH ₃) ₂ NOCH | 60 |
| 30 | Dimetylsunfat | 77-78-1 | (CH ₃) ₂ SO ₄ | 0.5 |
| 31 | Dimetylhydrazin | 57-14-7 | (CH ₃) ₂ NNH ₂ | 1 |
| 32 | Dinitrobenzen | 25154-54-5 | C ₆ H ₄ (NO ₂) ₂ | 1 |
| 33 | Etylaxetat | 141-78-6 | CH ₃ COOC ₂ H ₅ | 1400 |
| 34 | Etylamin | 75-04-7 | CH ₃ CH ₂ NH ₂ | 45 |
| 35 | Etylbenzen | 100-41-4 | CH ₃ CH ₂ C ₆ H ₅ | 870 |
| 36 | Etylbromua | 74-96-4 | C ₂ H ₅ Br | 890 |
| 37 | Etylendiamin | 107-15-3 | NH ₂ CH ₂ CH ₂ NH ₂ | 30 |
| 38 | Etylendibromua | 106-93-4 | CHBr=CHBr | 190 |
| 39 | Etylacrilat | 140-88-5 | CH ₂ =CHCOOC ₂ H ₅ | 100 |
| 40 | Etylen clohydrin | 107-07-3 | CH ₂ ClCH ₂ OH | 16 |
| 41 | Etylen oxyt | 75-21-8 | CH ₂ OCH ₂ | 20 |

| S.N. | Name | CAS No. | Chemical formula | Maximum concentration (mg/Nm ³) |
|------|--------------------------|------------|---|---|
| 42 | Etyl ete | 60-29-7 | C ₂ H ₅ OC ₂ H ₅ | 1200 |
| 43 | Etyl clorua | 75-00-3 | CH ₃ CH ₂ Cl | 2600 |
| 44 | Etylsilicat | 78-10-4 | (C ₂ H ₅) ₄ SiO ₄ | 850 |
| 45 | Etanolamin | 141-43-5 | NH ₂ CH ₂ CH ₂ OH | 45 |
| 46 | Fufural | 98-01-1 | C ₄ H ₃ OCHO | 20 |
| 47 | Fomaldehyt | 50-00-0 | HCHO | 20 |
| 48 | Fufuryl (2-Furylmetanol) | 98-00-0 | C ₄ H ₃ OCH ₂ OH | 120 |
| 49 | Flotriclometan | 75-69-4 | CCl ₃ F | 5600 |
| 50 | n-Heptan | 142-82-5 | C ₇ H ₁₆ | 2000 |
| 51 | n-Hexan | 110-54-3 | C ₆ H ₁₄ | 450 |
| 52 | Isopropylamin | 75-31-0 | (CH ₃) ₂ CHNH ₂ | 12 |
| 53 | n-butanol | 71-36-3 | CH ₃ (CH ₂) ₃ OH | 360 |
| 54 | Metyl mercaptan | 74-93-1 | CH ₃ SH | 15 |
| 55 | Metylaxetat | 79-20-9 | CH ₃ COOCH ₃ | 610 |
| 56 | Metylacrylat | 96-33-3 | CH ₂ =CHCOOCH ₃ | 35 |
| 57 | Metanol | 67-56-1 | CH ₃ OH | 260 |
| 58 | Metylaxetylen | 74-99-7 | CH ₃ C=CH | 1650 |
| 59 | Metylbromua | 74-83-9 | CH ₃ Br | 80 |
| 60 | Metylcyclohexan | 108-87-2 | CH ₃ C ₆ H ₁₁ | 2000 |
| 61 | Metylcyclohexanol | 25639-42-3 | CH ₃ C ₆ H ₁₀ OH | 470 |
| 62 | Metylcyclohexanon | 1331-22-2 | CH ₃ C ₆ H ₉ O | 460 |
| 63 | Metylclorua | 74-87-3 | CH ₃ Cl | 210 |
| 64 | Metylen clorua | 75-09-2 | CH ₂ Cl ₂ | 1750 |
| 65 | Metyl cloroifm | 71-55-6 | CH ₃ CCl ₃ | 2700 |
| 66 | Monometylanilin | 100-61-8 | C ₆ H ₅ NHCH ₃ | 9 |
| 67 | Metanolamin | 3088-27-5 | HOCH ₂ NH ₂ | 31 |
| 68 | Naphtalen | 91-20-3 | C ₁₀ H ₈ | 150 |
| 69 | Nitrobenzen | 98-95-3 | C ₆ H ₅ NO ₂ | 5 |
| 70 | Nitroetan | 79-24-3 | CH ₃ CH ₂ NO ₂ | 310 |
| 71 | Nitroglycerin | 55-63-0 | C ₃ H ₅ (ONO ₂) ₃ | 5 |
| 72 | Nitrometan | 75-52-5 | CH ₃ NO ₂ | 250 |
| 73 | 2-Nitropropan | 79-46-9 | CH ₃ CH(NO ₂)CH ₃ | 1800 |
| 74 | Nitrotoluen | 1321-12-6 | NO ₂ C ₆ H ₄ CH ₃ | 30 |
| 75 | 2-Pentanon | 107-87-9 | CH ₃ CO(CH ₂) ₂ CH ₃ | 700 |
| 76 | Phenol | 108-95-2 | C ₆ H ₅ OH | 19 |
| 77 | Phenylhydrazin | 100-63-0 | C ₆ H ₅ NHNH ₂ | 22 |
| 78 | n-Propanol | 71-23-8 | CH ₃ CH ₂ CH ₂ OH | 980 |
| 79 | n-Propylaxetat | 109-60-4 | CH ₃ -COO-C ₃ H ₇ | 840 |
| 80 | Propylendiclorua | 78-87-5 | CH ₃ -CHCl-CH ₂ Cl | 350 |
| 81 | Propylenoxyt | 75-56-9 | C ₃ H ₆ O | 240 |
| 82 | Pyridin | 110-86-1 | C ₅ H ₅ N | 30 |
| 83 | Pyren | 129-00-0 | C ₁₆ H ₁₀ | 15 |
| 84 | p-Quinon | 106-51-4 | C ₆ H ₄ O ₂ | 0.4 |
| 85 | Styren | 100-42-5 | C ₆ H ₅ CH=CH ₂ | 100 |
| 86 | Tetrahydrofural | 109-99-9 | C ₄ H ₈ O | 590 |

| S.N. | Name | CAS No. | Chemical formula | Maximum concentration (mg/Nm ³) |
|---|------------------------|------------|---|---|
| 87 | 1,1,2,2-Tetrachloetan | 79-34-5 | Cl ₂ HCCHCl ₂ | 35 |
| 88 | Tetrachloetylen | 127-18-4 | CCl ₂ =CCl ₂ | 670 |
| 89 | Tetrachlometan | 56-23-5 | CCl ₄ | 65 |
| 90 | Tetranitrometan | 509-14-8 | C(NO ₂) ₄ | 8 |
| 91 | Toluen | 108-88-3 | C ₆ H ₅ CH ₃ | 750 |
| 92 | 0-Toluidin | 95-53-4 | CH ₃ C ₆ H ₄ NH ₂ | 22 |
| 93 | Toluen-2,4-diisocyanat | 584-84-9 | CH ₃ C ₆ H ₃ (NCO) ₂ | 0.7 |
| 94 | Trietylamin | 121-44-8 | (C ₂ H ₅) ₃ N | 100 |
| 95 | 1,1,2-Trichloetan | 79-00-5 | CHCl ₂ CH ₂ Cl | 1080 |
| 96 | Trichloetylen | 79-01-6 | ClCH=CCl ₂ | 110 |
| 97 | Xylen | 1330-20-7 | C ₆ H ₄ (CH ₃) ₂ | 870 |
| 98 | Xylidin | 1300-73-8 | (CH ₃) ₂ C ₆ H ₃ NH ₂ | 50 |
| 99 | Vinylelorua | 75-01-4 | CH ₂ =CHCl | 20 |
| 100 | Vinyltoluen | 25013-15-4 | CH ₂ =CHC ₆ H ₄ CH ₃ | 480 |
| Remarks: - CAS No.: Chemical Abstracts Service Registry Number; - UNDET means undetectable. | | | | |

TABLE 4. NATIONAL TECHNICAL REGULATIONS ON INDUSTRIAL EMISSION
FROM CEMENT PRODUCTION
QCVN 23:2009/BTNMT

Permitted maximum concentration of pollution parameters in industrial emission from cement production is calculated as below:

$$C_{max} = C \times K_p \times K_v$$

In which:

- C_{max} is permitted maximum concentration of pollution parameters in industrial emission from cement production, measured by miligram per standard cubic meter of emission (mg/Nm³);
- C is concentration of pollution parameters in industrial emission from cement production;
- K_p is capacity coefficient as regulated in the following table:

| Designed total capacity (million tons/year) | Coefficient K _p |
|---|----------------------------|
| P ≤ 0.6 | 1.2 |
| 0.6 < P < 1.5 | 1.0 |
| P > 1.5 | 0.8 |

- K_v is regional coefficient (Type 3: industrial park, K_v = 1)

* Concentration C of pollution parameters used as a basis for calculation of their permitted maximum concentration of pollution parameters in industrial emission from cement production is indicated in the table below:

| S.N. | Parameters | Concentration C (mg/Nm ³) | | |
|---|--|---------------------------------------|------|------|
| | | A | B1 | B2 |
| 1 | Total dust | 400 | 200 | 100 |
| 2 | Carbon monoxide, CO | 1000 | 1000 | 500 |
| 3 | Nitrogen oxide, NO _x (calculating according to NO ₂) | 1000 | 1000 | 1000 |
| 4 | Sulfur dioxide, SO ₂ | 1.500 | 500 | 500 |
| <p>Notes:</p> <ul style="list-style-type: none"> - Exclusive national technical regulations on the environment shall be applied to cement kilns combined with burning hazardous waste. - CO, NO_x, SO₂ concentration shall not be stipulated for material grinding factories /clinke. | | | | |

In which:

- Column A stipulates concentration C of pollution parameters in industrial emission from cement production which is used as basis for calculating allowed maximum concentration applied to production lines of the plant and cement manufacturing facilities operating before 16 January 2007 with application period of being until 1 November 2011;
- Column B1 stipulates concentration C of pollution parameters in industrial emission from cement production which is used as basis for calculating allowed maximum concentration applied to:
 - + Production lines of the plant and cement manufacturing facilities operating before 16 January 2007 with application period of being from 1 November 2011 to 31 December 2014;
 - + Production lines of the plant and cement manufacturing facilities operating since 16 January 2007 with application period of being until 31 December 2014;
- Column B2 stipulates concentration C of pollution parameters in industrial emission from cement production which is used as basis for calculating allowed maximum concentration applied to:
 - + Production lines of the plant and cement manufacturing facilities that have been built or renovated or subject to technological transfer;
 - + Production lines of the plant and cement manufacturing facilities with application period of being from 1 January 2015;
- Apart from 4 parameters as described in Table 4, depending on needs and purposes of pollution control, concentration of other pollution parameters shall be applied according to provisions in column A or B in the Table 4 of QCVN 19:2009/BTNMT- The national technical regulations on industrial emission of dust and inorganic substances.

TABLE 5. NATIONAL TECHNICAL REGULATIONS ON INDUSTRIAL WASTEWATER

QCVN 40 : 2011/BTNMT

Permitted maximum value of pollution parameters in industrial wastewater is calculated as below:

$$C_{max} = C \times K_q \times K_f$$

Of which:

- C_{max} is permitted maximum value of pollution parameters in industrial wastewater when it is released into the source of receiving wastewater, measured by miligram per liter (mg/l);
- C is value of pollution parameters in industrial wastewater;
- K_q is flow coefficient/capacity of the source of receiving wastewater:

| Flow of the source of receiving wastewater (Q) Unit of measurement: cubic meter/second (m ³ /s) | Coefficient K_q |
|---|-------------------|
| $Q \leq 50$ | 0.9 |
| $50 < Q \leq 200$ | 1 |
| $200 < Q \leq 1000$ | 1.1 |
| $Q > 1000$ | 1.2 |

- K_f is flow coefficient:

| Flow of discharge source (F) Unit of measurement: cubic meter/day & night (m ³ /24h) | Coefficient K_f |
|--|-------------------|
| $F \leq 50$ | 1.2 |
| $50 < F \leq 500$ | 1.1 |
| $500 < F \leq 5,000$ | 1.0 |
| $F > 5,000$ | 0.9 |

- ❖ Apply the permitted maximum value $C_{max} = C$ (coefficients K_q and K_f are not applied) to parameters: temperature, pH, color, coliform, total radio activity α , total radio activity β .
- ❖ Value C of pollution parameters in industrial wastewater is prescribed in the following table:

| S.N. | Parameters | Unit of measurement | Value C | |
|------|---|---------------------|---------|----------|
| | | | A | B |
| 1 | Temperature | °C | 40 | 40 |
| 2 | Color | Pt/Co | 50 | 150 |
| 3 | pH | - | 6 to 9 | 5.5 to 9 |
| 4 | BOD ₅ (20°C) | mg/l | 30 | 50 |
| 5 | COD | mg/l | 75 | 150 |
| 6 | Suspended solid | mg/l | 50 | 100 |
| 7 | Arsenic | mg/l | 0.05 | 0.1 |
| 8 | Mercury | mg/l | 0.005 | 0.01 |
| 9 | Lead | mg/l | 0.1 | 0.5 |
| 10 | Cadmium | mg/l | 0.05 | 0.1 |
| 11 | Crom (VI) Chrome (III) Chromium (VI) | mg/l | 0.05 | 0.1 |
| 12 | Chromium (III) | mg/l | 0.2 | 1 |
| 13 | Copper | mg/l | 2 | 2 |
| 14 | Zinc | mg/l | 3 | 3 |
| 15 | Nickel | mg/l | 0.2 | 0.5 |
| 16 | Manganese | mg/l | 0.5 | 1 |
| 17 | Iron | mg/l | 1 | 5 |
| 18 | Total cyanide | mg/l | 0.07 | 0.1 |
| 19 | Total phenol | mg/l | 0.1 | 0.5 |
| 20 | Total mineral oil | mg/l | 5 | 10 |
| 21 | Sulfur | mg/l | 0.2 | 0.5 |
| 22 | Fluoride | mg/l | 5 | 10 |
| 23 | Ammonia (calculating according to N) | mg/l | 5 | 10 |
| 24 | Total nitrogen | mg/l | 20 | 40 |
| 25 | Total phosphorus (calculating according to P) | mg/l | 4 | 6 |
| 26 | Chloride (not applied when releasing into saltwater and brackish water) | mg/l | 500 | 1000 |
| 27 | Surplus Chloride | mg/l | 1 | 2 |
| 28 | Total plant protection chemical from organic chloride | mg/l | 0.05 | 0.1 |
| 29 | Total plant protection chemical from organic phosphorus | mg/l | 0.3 | 1 |
| 30 | Total PCB | mg/l | 0.003 | 0.01 |
| 31 | Coliform | Bacteria/100ml | 3000 | 5000 |
| 32 | Total radio activity α | Bq/l | 0.1 | 0.1 |
| 33 | Total radio activity β | Bq/l | 1.0 | 1.0 |

TABLE 6: STANDARDS ON RECEIVING WASTEWATER OF HIPC

| S.N | Parameters | Unit of measurement | Value |
|-----|-------------|---------------------|--------|
| 1 | Temperature | °C | 45 |
| 2 | pH | - | 5 to 9 |

| S.N. | Parameters | Unit of measurement | Value |
|------|--------------------------------------|---------------------|-------|
| 3 | Color level (Co-Pt at pH = 7) | - | 200 |
| 4 | BOD ₅ (20°C) | mg/l | 100 |
| 5 | COD | mg/l | 400 |
| 6 | Suspended solid | mg/l | 200 |
| 7 | Arsenic | mg/l | 0.1 |
| 8 | Mercury | mg/l | 0.01 |
| 9 | Lead | mg/l | 0,5 |
| 10 | Cadmium | mg/l | 0.01 |
| 11 | Chromium (VI) | mg/l | 0.5 |
| 12 | Chromium (III) | mg/l | 2 |
| 13 | Copper | mg/l | 5 |
| 14 | Zinc | mg/l | 5 |
| 15 | Nickel | mg/l | 2 |
| 16 | Manganese | mg/l | 5 |
| 17 | Iron | mg/l | 10 |
| 18 | Tin | mg/l | 5 |
| 19 | Cyanide | mg/l | 0.1 |
| 20 | Phenol | mg/l | 1 |
| 21 | Mineral oil | mg/l | 10 |
| 22 | Animal and vegetation oil | mg/l | 30 |
| 23 | PCB | mg/l | 0.01 |
| 24 | Sulfur | mg/l | 0.5 |
| 25 | Fluoride | mg/l | 10 |
| 26 | Chloride | mg/l | 1000 |
| 27 | Ammonia (calculating according to N) | mg/l | 15 |
| 28 | Total nitrogen | mg/l | 60 |
| 29 | Total phosphorus | mg/l | 8 |

TABLE 7. NATIONAL TECHNICAL REGULATIONS ON NOISE LEVELS

QCVN 26:2010/BTNMT

Permitted maximum noise limits (according to equivalent sound levels), dBA

| S.N. | Area | From 6:00 am to 9:00 pm | From 9:00 pm to 6:00 am |
|------|--------------|-------------------------|-------------------------|
| 1 | Special area | 55 | 45 |
| 2 | Normal area | 70 | 55 |

TABLE 8. NATIONAL TECHNICAL REGULATIONS ON VIBRATION LEVELS
QCVN 27:2010/BTNMT

1.Sources of vibration and shock caused by construction activities shall not exceed limits as indicated in the Table 8.1.

Table 8.1 – Allowed maximum values related to vibration acceleration in construction activities

| S.N. | Area | Applied time during the day | Allowed vibration acceleration limits, dB |
|------|--------------|-----------------------------|---|
| 1 | Special area | 6:00 am – 6:00 pm | 75 |
| | | 6:00 pm - 6:00 am | Floor level |
| 2 | Normal area | 6:00 am – 9:00 pm | 75 |
| | | 9:00 pm – 6:00 am | Floor level |

2.Sources of vibration and shock caused by production, trading and services activities shall not exceed limits as indicated in the Table 8.2.

Table 8.2 - Allowed maximum values related to vibration acceleration in production, trading and services activities

| S.N. | Khu vực | Applied time during the day and allowed vibration acceleration limits, dB | |
|------|--------------|---|-------------------|
| | | 6:00 am – 9:00 pm | 9:00 pm – 6:00 am |
| 1 | Special area | 60 | 55 |
| 2 | Normal area | 70 | 60 |

Vibration acceleration levels as specified in Tables 8.1 and 8.2 are:

- 1) the levels measured when oscillation is stable, or
- 2) the average value of the maximum figures for each oscillation that is measured according to cycle or intervals, or
- 3) the average value of 10 figures measured within each 5 seconds or its equivalence (L10) when oscillation is unstable and random.