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Section Four
Building Vitality

401	Chapter 1: Ventilation and Air Quality
401.01	Minimum Ventilation Requirements for Adequate Indoor Air Quality
	<p>All new and existing air conditioned buildings must be mechanically or mixed mode ventilated and must comply with the minimum requirements of ASHRAE Standard 62-2007.</p> <p>Occupancy density for each space is determined based on its activity in accordance with the requirements of Dubai Municipality if available or using the default occupancy density values in ASHRAE 62-2007</p>
401.02	Air Quality during Construction, Renovation or Decoration
	<p>For all buildings under construction or renovation, building occupant and systems must be protected from airborne contaminants which are generated or spread during construction or renovation inside the buildings. Including toxic substances or substances harmful to the human body, such as asbestos, lead, pesticides, heavy metals, mold, dust, fumes, paint, ...etc</p> <p>Unless it is required to provide ventilation during construction, the supply and return heating, ventilation, and air conditioning (HVAC) system openings must be closed and protected from contamination. All duct and other related air distribution component openings must be covered with tape, plastic, sheet metal or other methods to prevent dust or debris from collecting in the system.</p> <p>If the HVAC system is used during construction or renovation, temporary return air filters must be installed with a Minimum Efficiency Reporting Value (MERV) in accordance with ASHRAE Standard 52.2-2007 or an equivalent standard.</p> <p>Immediately prior to occupancy, the temporary return air filters must be removed and replaced with permanent filters having Minimum Efficiency Reporting Value (MERV) in accordance with ASHRAE Standard 52.2-2007 or an equivalent standard.</p>
401.03	Air Inlets and Exhausts
	<p>For all new and existing buildings:</p> <p>All ventilation system outdoor air intakes, including doors and operable windows, that are part of a mixed mode ventilation system, must be located at suitable distance from potential sources of contamination to reduce the possibility of odor, smoke or other air contaminants entering the ventilation system as required by Dubai Municipality, if any, or refer to ASHRAE Standard 62-2007 Table (5.1)</p> <p>Exhausted air must be discharged in a manner to avoid it being drawn back into the building or the building ventilation system and to ensure that it does not become a nuisance to the building occupants or other buildings occupants or pedestrians.</p>



401.04 Isolation of Pollutant Sources

For all new and existing buildings, where activities produce hazardous fumes or chemicals, spaces must be provided with separate air extraction systems to create negative pressure and exhaust the fumes or chemicals to ensure they do not enter adjacent rooms.

Dangerous Goods must be stored in accordance with Dubai Municipality Requirements.

401.05 Openable Windows

For all new buildings, opening windows must be provided in accordance with Dubai Municipality Building Regulations unless there is safety requirements restricting opening these windows.

401.06 Indoor Air Quality Compliance - New Buildings

For all new buildings, suitable ventilation for the building occupants and ensure the air quality in accordance with the technical guidelines issued by Dubai Municipality.

The buildings which optionally apply the following procedures will be awarded indoor air quality certificate by Dubai municipality.

A. Indoor air quality testing must be carried out prior to occupancy. The maximum limit for indoor air contaminants included in Table 401.6(1) must not be exceeded. A report which shows compliance with these requirements must be submitted to Dubai Municipality.

Table 401.6(1) - Schedule, Duration of Sampling, and Maximum Limit for Contaminants

Sampling Schedule	Type of Samples	Maximum Acceptable	Sampling Duration
Pre-Occupancy	Formaldehyde	< 0.08 parts per million (ppm)	8- hour continuous monitoring (8 hour time-weighted average [TWA])
	Total Volatile Organic Compound (TVOC)	< 300 micrograms/m ³	
	Suspended Particulates (<10 microns)	< 150 micrograms/m ³	

B. Air Quality testing must be carried out by an air testing company or laboratory accredited by Dubai Municipality (DM), and the Compliant test results must be submitted to DM.

C. Air quality testing equipment must have initial and periodical calibration certificate as per manufacturer requirement from an external calibration facility accredited by DM or at least annual calibration certificate. The initial and periodical calibration certificates must be saved in a special register to be checked by DM in order to ensure the accuracy of the readings as condition of renewal the indoor air quality certificate.



401.07 Indoor Air Quality Compliance - Existing Buildings

For all existing hotels, shopping mall, educational, health and government buildings, buildings which are used to provide health care, mosques and worship buildings, theatres, cinemas or any other existing buildings to be determined by DM later, suitable ventilation for the building occupants and ensure the air quality in accordance with the technical guidelines issued by Dubai Municipality.

The buildings which optionally apply the following procedures will be awarded indoor air quality certificate by Dubai municipality.

A. Indoor air testing for the contaminants listed in Table 401.7 (1) must be carried out to ensure the air quality in a building is suitable for occupation, the maximum limit for indoor air contaminants included in Table 401.7 (1) must not be exceeded.

Table 102.02 (1)

Sampling Schedule	Type of Samples	Maximum Acceptable	Sampling Duration
Initial test completed by 31 December 2011.	Formaldehyde	< 0.08 ppm	8- hour continuous monitoring (8 hour time-weighted average [TWA])
	Total Volatile Organic Compound (TVOC)	< 300 micrograms/ m ³	
Further testing within 5 years of last compliant test.	Respirable Dust (<10 microns)	< 150 micrograms/ m ³	
	Ozone	0.06 ppm (120 micrograms/ m ³)	
	Carbon Dioxide	800 ppm (1440 microgram/ m ³)	
	Carbon Monoxide	9 ppm (10 micrograms/ m ³)	
	Bacteria	500 CFU/ m ³ (Algar plate)	
	Fungi	500 CFU/ m ³ (Algar plate)	

B. Air Quality testing must be carried out by an air testing company or laboratory accredited by Dubai Municipality (DM) and the Compliant result must be submitted to DM.

C. Air quality testing equipment must have initial and periodical calibration certificates as per manufacturer requirement from an external calibration facility accredited by DM or at least annual calibration certificate. The initial and periodical calibration certificates must be saved in a special register to be checked by DM in order to ensure the accuracy of the readings as condition of renewal the indoor air quality certificate.



401.08 Inspection and Cleaning of HVAC Equipment

For all new and existing buildings, the cleanness of HVAC equipment and systems must be maintained and all its parts must be inspected and cleaned in accordance with the standard specifications approved by Dubai Municipality and in accordance with the technical guidelines issued by Dubai Municipality. While specialized maintenance companies approved by Dubai Municipality must carry out Inspection and cleaning or provide a proof that maintenance shall be done by building operator if he has a qualified personnel and equipment to do the job.

401.09 Parking Ventilation

For all buildings with enclosed parking:

- A.** Mechanical ventilation must be provided to ensure that the Carbon Monoxide (CO) concentration in the enclosed parking area is maintained below fifty (50) parts per million (ppm) by:
 - Providing a minimum of six (6) outside air changes per hour, or
 - Installing a variable volume ventilation system controlled in response to input from a minimum of one CO sensor per four hundred square meters (400 m²) floor area of parking.
- B.** A supply of outdoor air must be provided to each parking level.
- C.** Occupied areas such as offices, shopping centres, hotels, waiting rooms, and ticket booths connected to enclosed parking, must be supplied with conditioned air under positive pressure compared with adjoining parking area
- D.** Ventilation systems must be capable of providing ten (10) air changes per hour for smoke clearance purposes in case of a fire incident.
- E.** CO monitoring equipment must be installed with a minimum of one CO sensor per four hundred square meters (400 m²) floor area of parking. Sound alarm triggers when the CO concentration reaches or exceeds seventy five (75) ppm in, at least, five percent (5%) of the monitored locations.
- F.** Where a Building Management System (BMS) or Central Control and Monitoring System (CCMS) is installed, the CO concentration must be monitored to allow real-time profiling and management of air quality.
- G.** CO monitoring equipment must be checked and recalibrated every six (6) months or according to manufacturer specification by a specialized calibration company certified by Dubai Municipality. Test results and calibration certificates must be kept onsite and be readily available for inspection by DM staff.



401.08 Environmental Tobacco Smoke

A.Smoking is strictly prohibited in all public in accordance with Local Order No 11 – 2003 including but not limited to shopping centres, hotels, restaurants, government buildings, hospitals, healthcare facilities, commercial buildings, common accommodation, coffee shops and amusement and entertainment or any other places determined by Dubai Municipality except for places in which smoking is permitted

B.Places in which smoking is permitted are determined in accordance with the conditions listed in the Manual of Regulating Smoking in Public Places issued by Dubai Municipality by administrative resolution no 92 for the year 2009 in which public places where smoking is strictly prohibited and places where smoking is permitted are determined according to specific conditions.

C.Smoking designated areas must be at least twenty five (25) feet away from the building entrances of the building, doors and operable windows and ventilation system outdoor air intakes

D.An annual permit is issued from the Public Health and Safety Department of Dubai Municipality for all places in which smoking is permitted after providing all required documents and drawings mentioned in the guide

402 Chapter 2: Thermal Comfort

402.01 Thermal Comfort

For all new and existing buildings, the heating, ventilation and air conditioning (HVAC) system must be capable of providing the following range of conditions for ninety five percent (95%) of the year:

	Lower Limit	Upper Limit
Dry bulb temperature	DB: 22.5 °C	DB: 25.5 °C
Relative humidity	RH: 30% (min)	RH: 60% (max)

For occupant comfort, normal occupied spaces should have an average air velocity between (0.2 – 0.3) m/s.

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Chapter 3: Acoustic Comfort

403.01

Acoustical Control

For all new buildings, the acoustic performance relating to Internal Noise Criteria from External Noise Sources, Internal Noise Criteria from Mechanical Services Noise, Internal Airborne Sound Insulation Guidance Values, and Internal Impact Sound Pressure Levels meet the control requirements set out in Table 403.01 (1).

Table 403.01(1) – Acoustical Control requirements

Building Type	Document Reference
Villas / Residential* Buildings	Building Regulations Approved Document E (revised 2003) (UK)
Healthcare Facilities	Health Technical Memorandum 08-01 (UK)
Educational Facilities**	Building Bulletin 93: Acoustic Design of Schools – A design Guide (UK)
Commercial Buildings	BS8233:1999 “Sound insulation and noise reduction for buildings – code of practice”. (UK)
Industrial	BS8233:1999 “Sound insulation and noise reduction for buildings – code of practice”. (UK)
Public	BS8233:1999 “Sound insulation and noise reduction for buildings – code of practice”. (UK)

* Residential buildings include Villas, Apartments, Labour Accommodations and Student Accommodations.

** Educational Facilities include Nursery Schools, Primary Schools, Secondary Schools, Colleges and Universities.

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Chapter 4: Hazardous Materials

404.01

Low Emitting Material: Paints and Coatings

For all buildings, including new applications in existing buildings, all paints and coatings used in the building should not exceed allowed limits of Volatile Organic Compound (VOC), these paints and coatings must be accredited/certified from Dubai Central Lab or any source approved by Dubai Municipality.



404.02 Low Emitting Material: Adhesives and Sealants

For all buildings, including new applications in existing buildings, all adhesives, adhesive bonding primers, adhesive primers, sealants and sealant primers used in the building should not exceed allowed limits of Volatile Organic Compound (VOC), these materials must be accredited/certified from Dubai Central Lab or any source approved by Dubai Municipality.

404.03 Carpet Systems

For all new and existing public and commercial buildings, each new carpet system used must be certified / accredited from Dubai Central Lab or any other source approved by Dubai Municipality (DM).

Carpet are not allowed to be used in labor accommodation, educational facilities or any other places determined by DM.

405 Chapter 5: Day lighting and Visual Comfort

405.01 Provision of Natural Daylight

For all new buildings, other than industrial buildings, provision for adequate natural daylight must be made in order to reduce their reliance on electrical lighting and to improve conditions for the building occupants and provide lighting openings in accordance with Dubai municipality building regulation and specification.

405.02 Views

All new office, residential and public buildings must provide direct line of sight (views) to the outdoor environment in accordance with Dubai municipality building regulation and specification.



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Chapter 6: Water Quality

406.01

Legionella Bacteria and Building Water Systems

For all new and existing buildings must apply the technical guidelines issued by Dubai Municipality which includes:

- A.** All water systems and networks which creates a water spray or aerosol including but not limited to cooling towers, evaporative condensers, hot and cold water systems, showers, evaporative air coolers, spas, fountains, misters, ..etc must be periodically maintained, cleaned, disinfected and checked periodically to minimize the risk of Legionella bacteria or germs contamination in accordance with the technical guidelines issued by Dubai Municipality regarding the control of Legionella bacteria in water systems.
- B.** All water systems equipments and accessories including but not limited to potable water network, hot and cold water systems, water tanks, pumps, pipes and fittings, must be maintained, cleaned and disinfected.
- C.** Sampling and testing must be carried out for the presence of bacteria/germs and Legionella bacteria
- D.** All equipments and devices of swimming pools, spa pools, whirlpool baths, hydrotherapy pools and Jacuzzi must be maintained, cleaned, disinfected and checked periodically.
- D.** All equipment's and devices of irrigation system must be maintained, cleaned, disinfected and checked periodically

Specialized companies approved by Dubai Municipality must do water tests and sampling. All test results must be recorded and kept along with the records of maintenance and remedial works at site to be checked by Dubai Municipality.

406.02

Water Quality of Water Features

For all new and existing buildings, all Water Features with a water storage volume of over 1,000 liters and which creates a water spray or aerosol including but not limited to waterfalls, ponds, streams, ...etc must be maintained, cleaned, disinfected and checked periodically to minimize the risk of Legionella bacteria or germs contamination and not exceed the maximum limits outlined in the technical guidelines issued by Dubai Municipality.

