

绿色建筑描述 Description of the green building GECQ

DGNB 建筑可持续性评价系统，是一套以评价和优化建筑物及城区的环保性、节能性、经济性和使用舒适性等为目标的评价系统。DGNB 是当今世界上最为先进、完整，同时也是最新的可持续建筑评估体系。

DGNB (Deutsche Gesellschaft für nachhaltiges Bauen = German Association for Sustainable Construction) is a system to evaluate and optimize buildings with regard to being environmentally friendly, energy saving, economical and comfortable to use. It is the most advanced building evaluation system worldwide.

1. 低碳 Low-carbon

DGNB 体系对建筑物碳排放量首次提出了系统而可操作的计算方法，德国中心在其设计年限（50年）内，每年减少向大气排放 CO₂ 量 5680t。

The DGNB system provides a systematic and practical method to calculate the discharge of carbon by the building. GECQ was designed and built to reduce carbon discharge by 5680t every year.

2. 能源 Energy

德国中心大量使用了新能源，譬如使用了地源热泵，同时利用空置屋面做了太阳能热水，光伏发电。与国标相比，该项目在其设计生命周期（50年）内，每年节能 157 万 kWh，节能率 19%。GECQ building uses a lot of new energy resources, e.g. geothermal heat, solar energy, photovoltaic power. Compared to the international standard, it will save about 1.57million kWh every year, with an energy saving ratio of 19%.

3. 水需求和废水生产量 Water recycling

增加中水处理站，将酒店产生的生活污水处理成中水，回用后作为冲厕、洗车、浇灌。并设置了一套完成的雨水收集系统，通过室外透水混凝土路面，将所收集雨水均通过地表径流收集到水库，扣除全年蒸发量后，作为中水处理站的补水使用。

Normal waste water enters the reclaim water processing station, is turned into reclaimed water and used for toilet flushing, car washing, watering. Rain is collected through the permeable concrete road and overland runoff into the reservoir; after setting off the annual evaporation capacity it will be a supply to the reclaim water station.

4. 热舒适度 Heating comfort level

冬季室内温度 20°C (地暖) , 夏季室内温度 25°C (风机盘管) , 新风机组均设有热回收段 , 利用板式换热器进行热回收 , 回收效率 70%。

The indoor temperature is 20°C in winter (by floor heating) and 25°C in summer (by fan coil), the new fan system has a heat recovery section that works using a heat exchanger and has a recovery efficiency of 70%.

5. 室内空气质量 Indoor air quality

通过严控装饰材料的 VOC 指标 , 使得建成后四周 , 房间内 TVOC(总挥发性有机化合物)含量不高于 500µg/m³ (国标为 600µg/m³) , 甲醛含量不高于 60µg/m³ (国标为 100µg/m³) 。办公区域为机械通风 , 新风量为 30m³/h.人。

Strict control of finishing materials under the TVOC (total volatile organic compound) release standard. Upon completion, the TVOC release indoors is not higher than 500µg/m³ (national standard is 600µg/m³), methanol is below 60µg/m³ (national standard is 100µg/m³) . The office area was designed to be mechanically ventilated; the fresh air volume is 30m³/h.

6. 视觉舒适度 Vision comfort level

整个建筑的可利用日光为 56% , 幕墙的透光率 60% , 采用内遮阳防眩光 , 为了充分利用自然光 , 节省能耗 , 所有照明均采用 DALI 调光 , 通过人体感应器和光学感光器 , 自动调节房间内的照度。

The rate for sun use availability is 56%, the light transmittance of the glass curtain wall is 60%, inner curtain technology prevents dazzle effects, efficient use of natural light saves energy, all illumination adopts DALI dimmer technology, automatically adjusting the illumination in the room.

7. 人员控制 Control units

德国企业中心每个办公室为 60 平米左右 , 按每人 10 平米的办公面积 , 每个房间 6 人办公。DGNB 要求每 3 人一个控制单元 , 故每个房间内的地暖、空调、新风、窗帘、照明等均为两个控制单位 , 分设不同的控制面板。所有控制均集中于一处 , 便于使用。

All rooms of GECQ building are around 60sqm per unit. Based on 10sqm/person, each such room is designed for 6 people. DGNB standards require that every 3 person need one control unit, so every room has 2 control units, set up in separate panels. All the control units are arranged in one line, for convenient use.

8. 室外空间质量 Outdoor space use

84.3%的屋面被利用，用作太阳能发电、太阳能热水器、屋顶绿化，屋面观景平台。

84.3% of the building surface is utilized for generating electricity through solar energy and solar energy water heater. Ample green space and viewing platforms are available outside.

9. 噪声控制 Noise control

采用轻钢龙骨敷设石膏，内塞隔音棉的处理方式，保证办公区域隔墙的空气隔声量为 45dB(国标 60 分贝)，走廊及公共区域铺设亚麻地胶板、楼梯间铺设橡胶地板，保证楼板的撞击声压级不高于 45dB。

Using light steel keel and plaster, stuffed with soundproof cotton, the soundproof volume of the office walls is 45db (national standard is 60db). The corridor and public area are paved with flax rubber, rubber paved in the staircase, preventing that the sound exceeds 45db.

10. 保温层 Insulation

把墙保温采用 30mm 厚真空保温板 (STP) ，屋顶采用 115mm 厚酚醛树脂保温，传热系数 $0.20W/m^2.K$ ；窗户的传热系数为 $1.3W/k$ ，采用三玻两中空 low-E 玻璃，断桥隔热铝型材,保温效果很好。

The outer wall uses 30mm vacuum insulation board, the roof is insulated with 115mm thick phenolic resin, heat transmission coefficient is $0.20W/m^2.K$. All windows are made of three-ply glass (low-E)and insulation aluminum frame, heat transmission coefficient is $1.3W/K$. These combined methods result in a very efficient overall insulation.