



## **BMW GROUP'S WIND TUNNELS**



## CLIMATIC WIND TUNNELS & TEST CHAMBERS FOR THE ENERGY AND ENVIRONMENTAL TEST CENTRE "ETC" IN MUNICH

"Bringing the road into the lab" - This challenging goal of the BMW Group has been realized successfully by an international consortium under the technical leadership of MCE.

Since the ETC started its test operation in January 2010 this unique testing facility allows to reproduce the road in the laboratory. The five test cells, consisting of three wind tunnels and two test chambers permit to simulate virtually any climatic condition like heat, cold, humidity, barometric pressure, solar radiation, wind, rain and even snowfall. By shifting a considerable part of the recent worldwide road testing into the ETC the vehicle development process becomes more efficient and fewer prototypes are needed by achieving realistic and reproducible testing results at any time within that facility.

### The scope of MCE included:

- Steel structure for the wind tunnels, altitude - and cold chamber
- Main fan including peripheral equipment
- Test facility systems (rain simulation, snow simulation, boundary layer control and a vehicle exhaust system etc.)
- Mechanical components (i.e. movable turning vane, car access door, shutter door, maintenance platforms etc.)
- Vehicle Transport System

Within the consortium "ARGE ETC" (AIOLOS, IMTECH, MCE), MCE was responsible to manage the overall project execution and site erection.

### Facts & Figures:

#### Altitude test facility:

Steel construction weight of chamber:	130 t
Floor surface of plenum (l/w):	12 x 6 m
Fan diameter:	2,24 m

#### Cold test facility:

Steel construction weight:	10 t
Floor surface of plenum (l/w):	10 x 5 m
Fan diameter:	1 m

#### Thermal wind tunnels (3 pcs.):

Steel construction weight per WT:	280 t
Wind tunnel dimension (l/w/h):	41,5 x 8 x 18 m
Floor surface of plenum (l/w):	13,6 x 10 m
Fan diameter:	4,75 m

Customer:	BMW Group
Project period:	2007 - 2009