

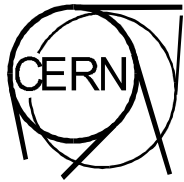
# First Thermo-siphon Workshop

## Scalability of the plant

**Jan Godlewski**

**HNINP PAS Krakow**

**CERN 6-th of July 2009**



# Objectives

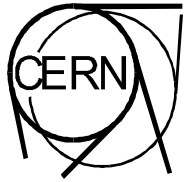


**Find out the possible low temperature chiller manufacturer for test stand and full size circuit**

**and:**

**Price estimation**

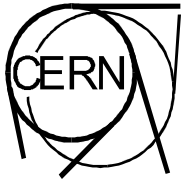
**Dimensions**



# Angelantoni Industrie possible supplier of the chiller



- ◆ **ANGELANTONI INDUSTRIE S.p.A**
  - **AG – Refrigeration Engineering and Contracting**
  - **ACS - Environmental Test Chambers**
  - **AS – Biomedical Equipment**



# Angelantoni Industrie



AG Division  
Refrigeration Engineering & Contracting



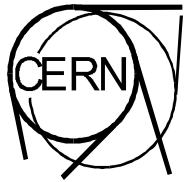
**INDUSTRIAL  
BRINE  
CHILLING UNIT**

**- 60°C**

**OPERATING  
TEMPERATURE**

**APPLICATION: PHARMACEUTICAL PLANT  
CUSTOMER: ACS DOBFAR  
ITALY**





# Angelantoni Industrie



**INDUSTRIAL  
BRINE CHILLING  
UNIT**

**- 70°C**

**OPERATING  
TEMPERATURE**

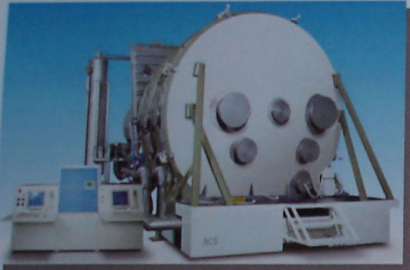
**CASCADE  
SYSTEM**

**APPLICATION: PHARMACEUTICAL PLANT  
CUSTOMER: ANTIBIOTICOS  
ITALY**



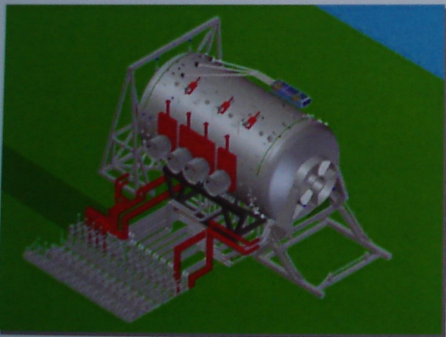
# Angelantoni Industrie - space simulator

*Environmental test chamber Division*

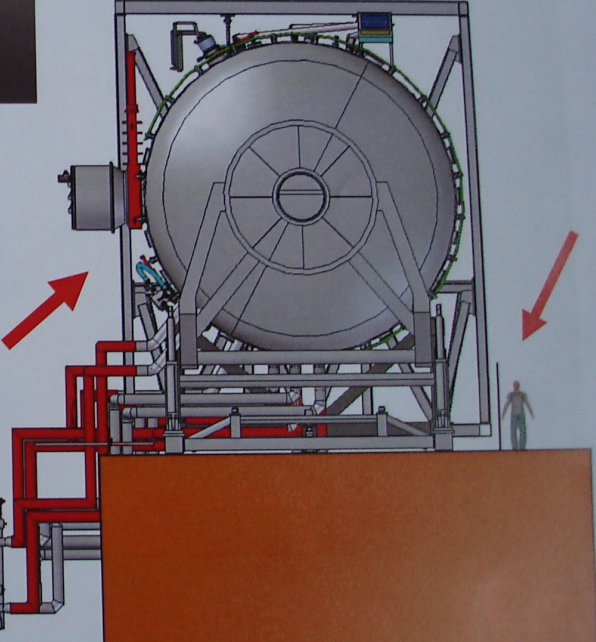


Cylindrical shell (vessel) of 4 m inner diameter and 3 m clear length excluding the depth of Dishes. (Flange to flange length of shell).

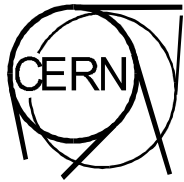
**SPACE SIMULATOR**  
Over 10 years of experience with more than 20 simulators manufactured



Cylindrical shell (vessel) of 6.5 m inner diameter and 10 m clear length excluding the depth of Dishes. (Flange to flange length of shell).



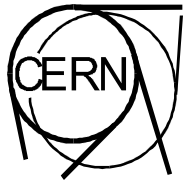
**-180 + 180 °C; 10<sup>-7</sup> Mbar**



# Angelantoni Industrie possible supplier of the chiller



- ◆ **For 2 kW cooling circuit one need 6 kW chiller for condensing temperature between -60 and -70 deg C.**
  - **Approximate dimensions of such chiller would be:**
    - Length 5 m
    - Width 1.5 m
    - Height 2.0 m
  - **Approximate price between 100 – 150 k€**
  - **Angelantoni Industrie will send us precise quotation during July.**



# Estimation for 280 kW cooling circuit



- ◆ **280 kW chiller with outlet temperature -70 C**
  - **Dimensions:**
    - Length                      14 m
    - Width                        8 m
    - Height                        6 m
  - **Price                        ~1.5 M€**

Thermo-siphon type circuit is expensive and requires a lot of space