

# **TC09 of ICG: Energy demand for glass production**

**1. meeting  
28.11.2013  
Eindhoven**

**B. Fleischmann  
HVG  
Offenbach**



**HVG-DGG**



# **Hüttentechnische Vereinigung der Deutschen Glasindustrie (HVG)**

**Research Association of the German Glass Industry**



**HVG-DGG**

(gegründet/founded 1920)

25 Mitgliedsfirmen/member companies  
mit/with 40 angeschlossenen Zweigwerken/subsidiaries

15 assoziierte Mitgliedsfirmen/associated members  
(Zulieferer/suppliers)  
mit/with 4 angeschlossenen Zweigwerken/subsidiaries



- Die HVG ist die **technisch wissenschaftliche Vereinigung** der Glasindustrie.  
*The HVG is the Research association of the German glass industry*
- Als **Mitglied der Arbeitsgemeinschaft industrieller Forschungsvereinigungen** (AiF, Mitglied seit 1955) führt die HVG **praxisorientierte, vorwettbewerbliche Projekte** der **Gemeinschaftsforschung** (IGF) in Zusammenarbeit mit der Glasindustrie und Hochschulinstituten durch.  
*Is member of the AiF, carrying out pre-competitive industrial research in close co-operation with glass industry and university*
- Sie bietet Glashütten eine Reihe von **Dienstleistungen** zur Lösung von Problemen bei der Glasherstellung an.  
*Applying services for glass industry in the field of emission measurements and technology as well as glass technology*



# HVG Department of Environmental Technology

## Laboratory and Measuring Institute

Accreditation DIN EN ISO/IEC 17025:2005  
§ 26/28 BlmSchG (German Law)



### Waste Gas Components

O<sub>2</sub> / CO<sub>2</sub> / CO  
NO<sub>x</sub> / SO<sub>2</sub> / SO<sub>3</sub> / HCl / HF / NH<sub>3</sub>  
Dust / Particulate Matter (PM 10/4/2.5)  
Metals (particulate and gaseous)  
Boron (particulate and gaseous)  
PCDF / PCDD / Total Carbon  
Moisture / Pressure / Acid Dew Point

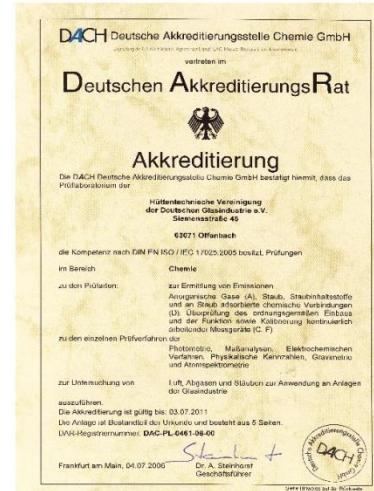


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## Services

(as required by national and international guidelines)

Emission Measurements  
Calibration of Continuous Emission Monitoring  
Expert Advice  
(eg.: Emission Limit Values of Oxy-Fuel Tanks)  
Emission Projections  
Stack Height Calculations



## Specials

Optimization of Combustion Conditions  
(NO<sub>x</sub> Reduction / O<sub>2</sub> and CO Control)

Improvement of Sorption Stages  
Quick Analysis During the Sampling on Site  
Parallel Sampling at Several Measuring Points  
(Top of Regenerator – Raw Gas – Clean Gas)  
Mass Flow Balances (sulfur, boron, chloride)

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# HVG Department of Glass Technology

## Service around the Furnace

Endoscopic Inspection of the Refractory Material  
Endoscopic Inspection of Flames (UV, VIS)

Heat Balance Measurements  
Furnaces  
IS Machines

Voltammetric Start Up Measurements  
Sulphur  
Iron  
Oxygen

Design and Aging of Regenerator Chambers

## Additional Services

Literature Research  
Special Services and Measurements on Demand



## Topics of In-House Training Courses

Introduction to Glass Production  
Sulphur Chemistry  
Strength and Fracture  
Refractories  
Measurement of Elevated Temperatures  
and other topics on demand



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# TC09 ?



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# Interest:

- Working with statistical data

problem: energy demand for the production of glass in Germany

75 PJ/y

90 PJ/y

all are using the same data?

end -

primary energy

Definitions !?

- Energy balance/heat balance

different thermodynamic data base are used

→ different / opposite results

What are we talking about

Common data base!

Thermodynamic calculations

- Energy efficiency / saving potentials

- Furnace (with regenerator/recuperator)
- Alternative furnace concepts
- Heat recovery systems
- (alternative) fuels

Energy saving potentials



# Interest:

More and better international  
statistical data!

What to measure  
and how?  
to receive reliable data

Not only furnace but the  
whole glass production  
process chain

Definitions !?  
What are we talking about

Common data base!  
Thermodynamic calculations

Energy saving potentials

Sustainability/balancing:  
cradle to cradle  
life time assessment





Thank you  
for your attention



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Service and Research in the Field of Glass