Rolf Rafflenbeul

Non Thermal Plasma Plants:
Experiences from the Industrial Praxis of Air Purification

Schematic depiction of the discharging vessel

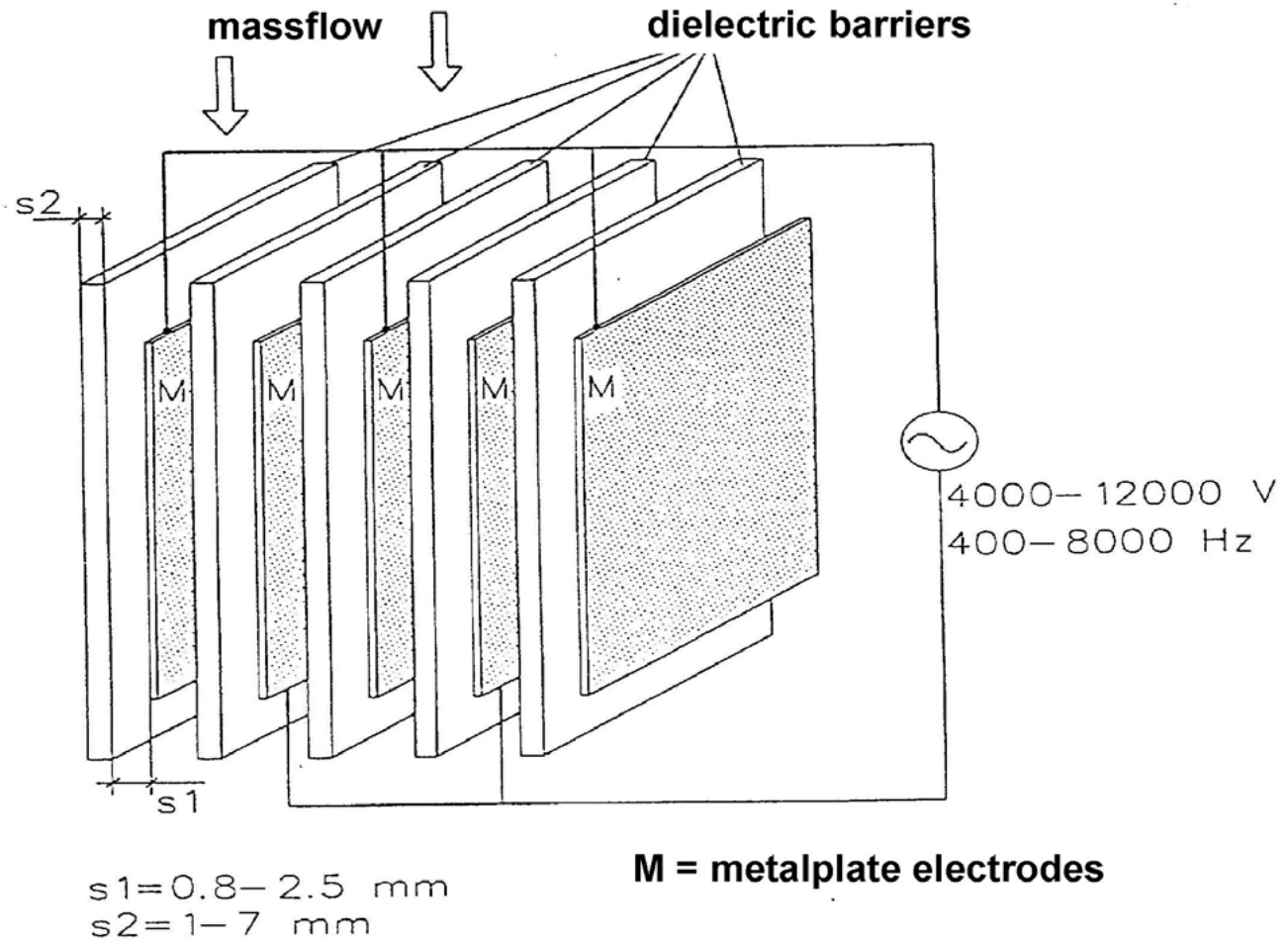

Figure 1: Schematic depiction of the discharging vessel for cold sparks discharges

Design of a discharging vessel

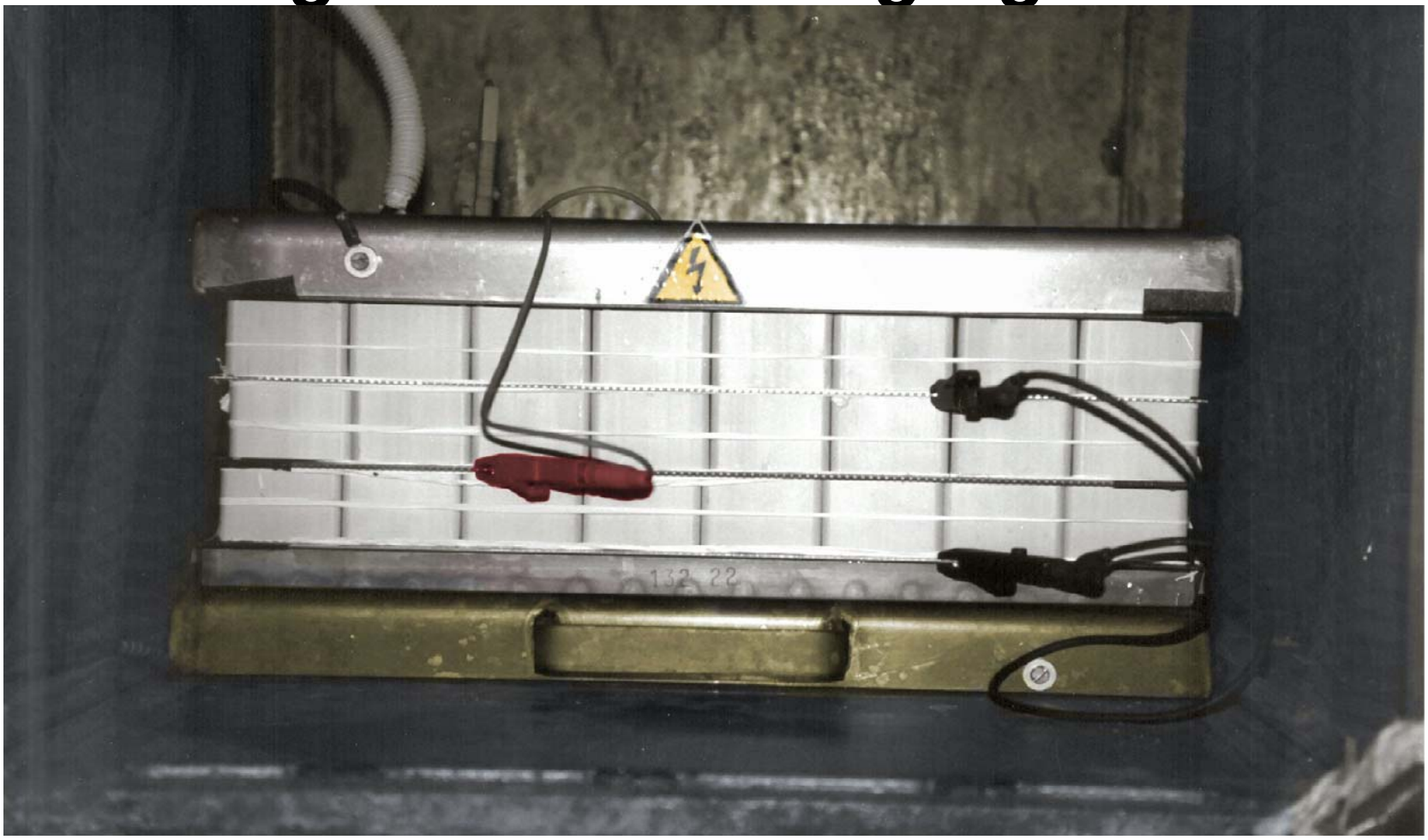

Figure 2: Design of a discharging vessel with comb disk modules made off cordierite (three-ply)

NTP module

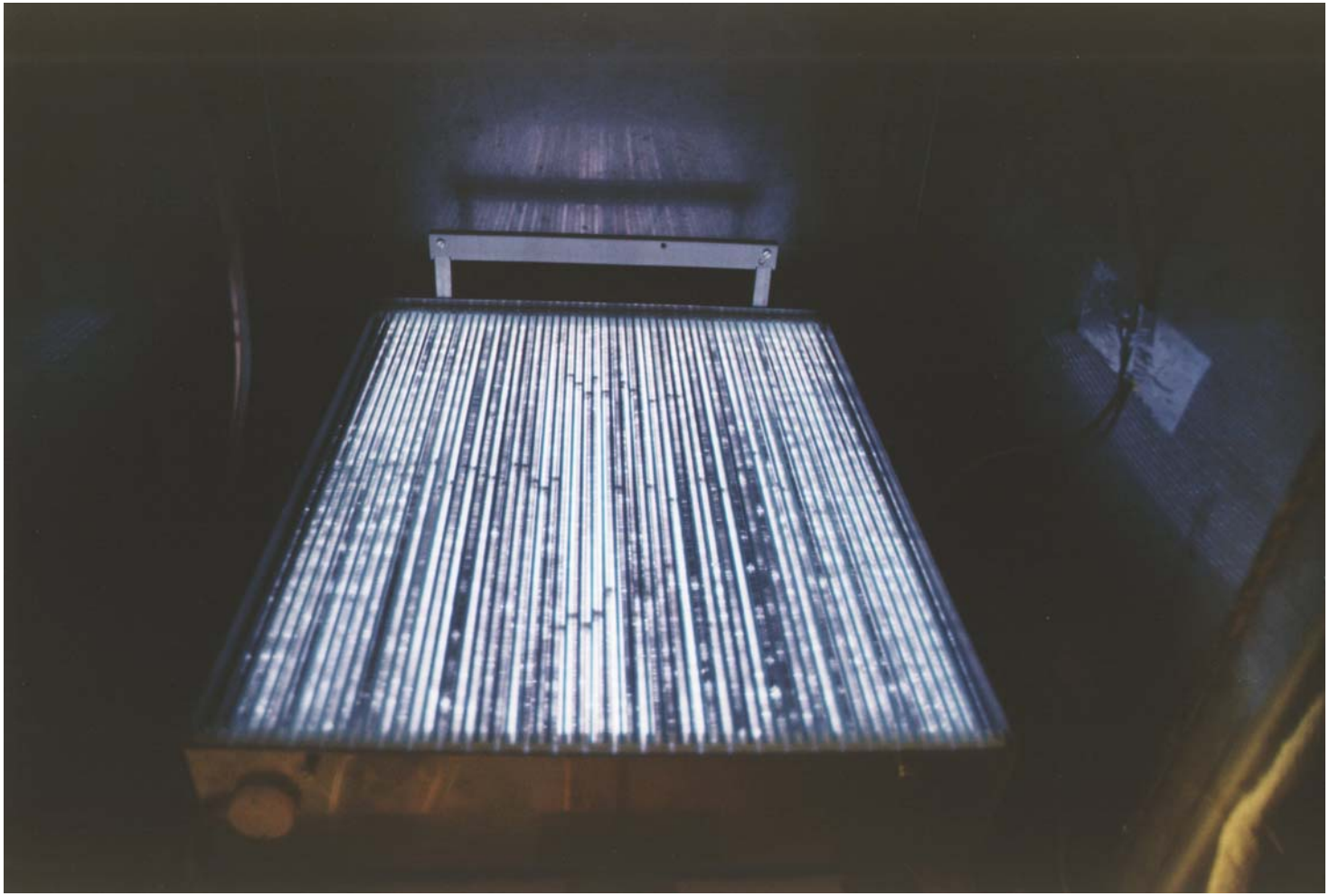

Figure 3: NTP module with glass barriers in operation

Homogenous discharge at barriers

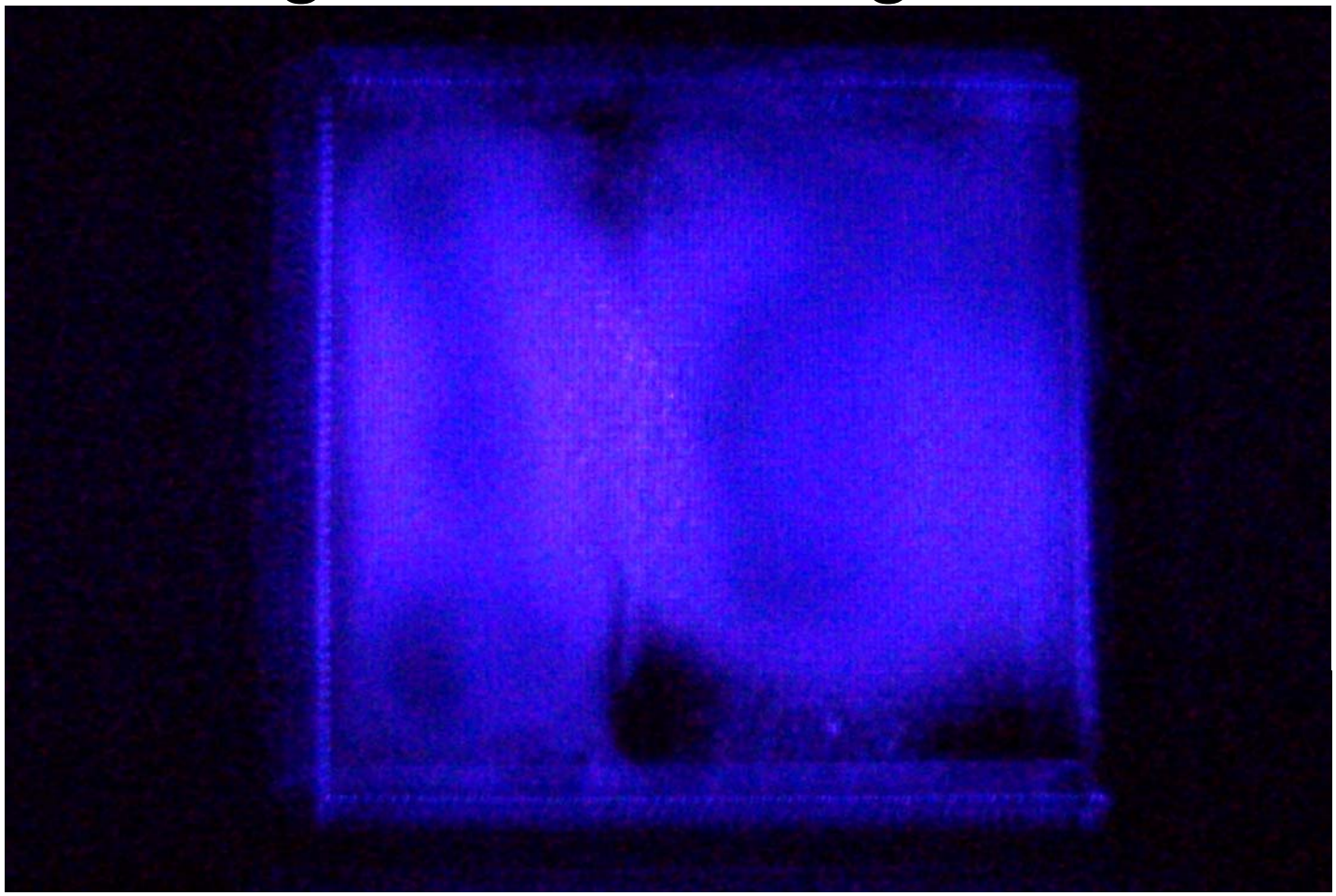

Figure 4: Homogenous discharge at barriers made off mullit ceramic (surface view)

Focused discharge in partial barrier sections

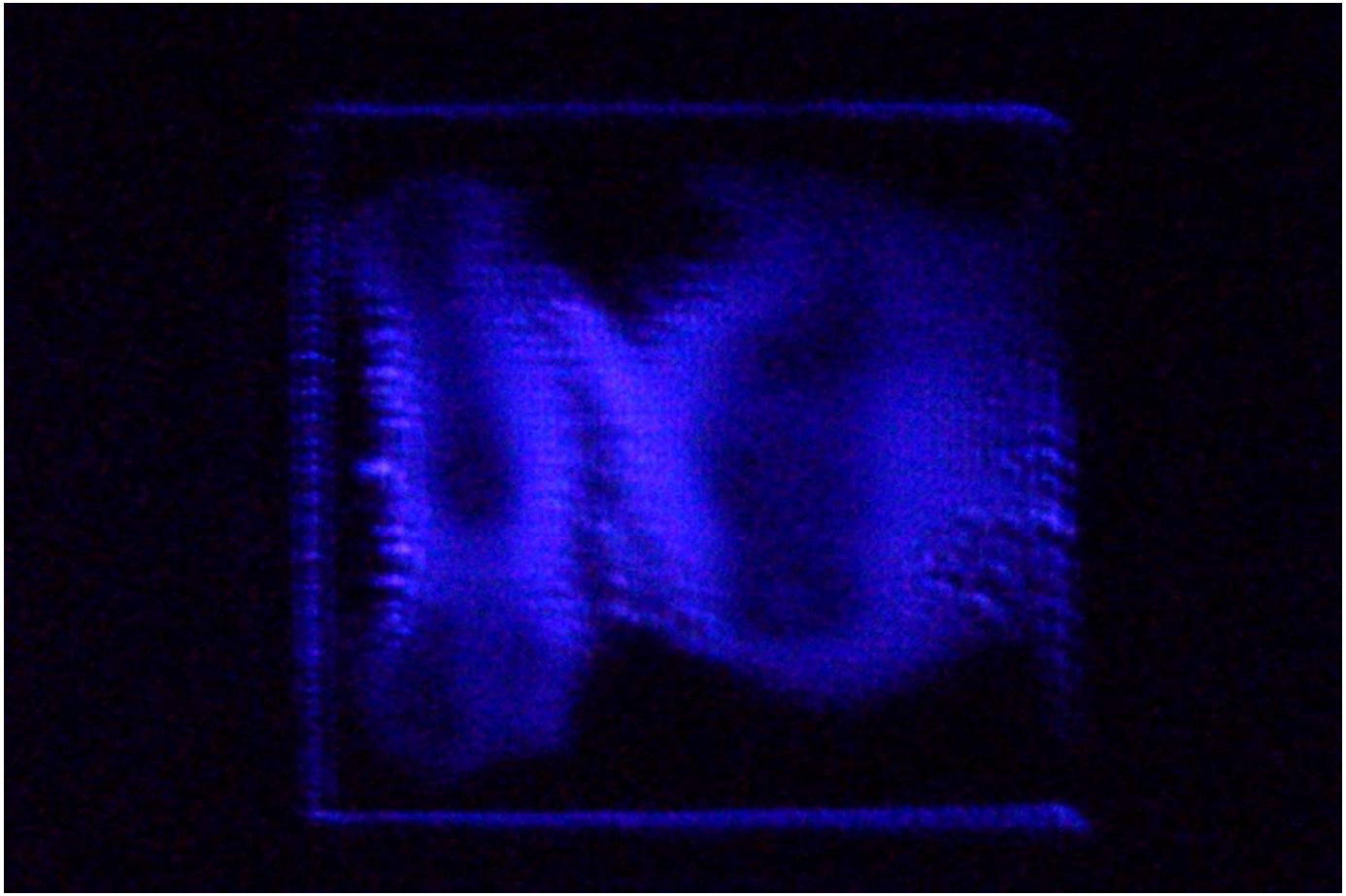

Figure 5: Focused discharge in partial barrier sections (surface view)

Discharge in a plasma module

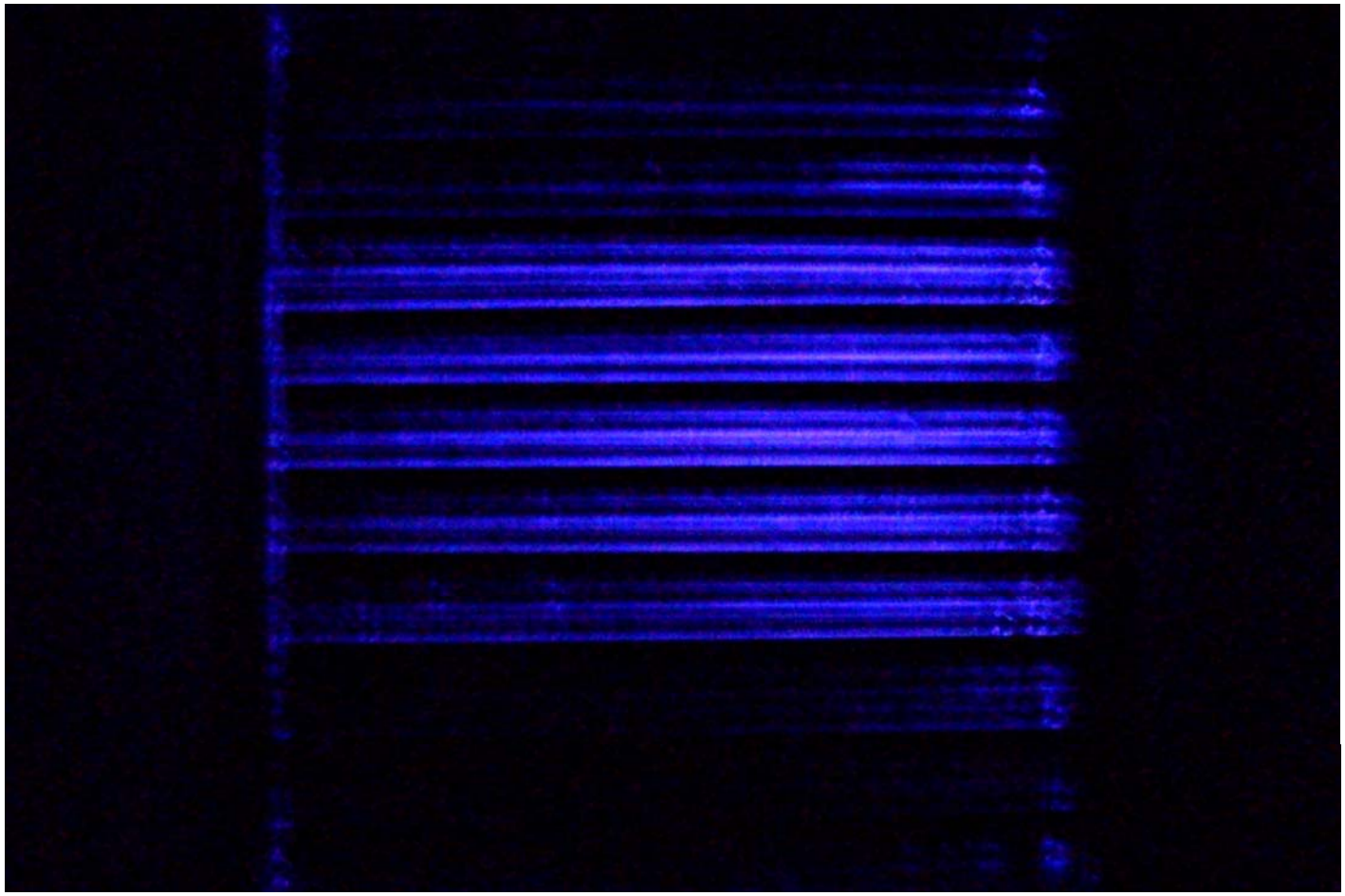

Figure 6: Discharge in a plasma module with plate barriers (top view)

Spot discharges

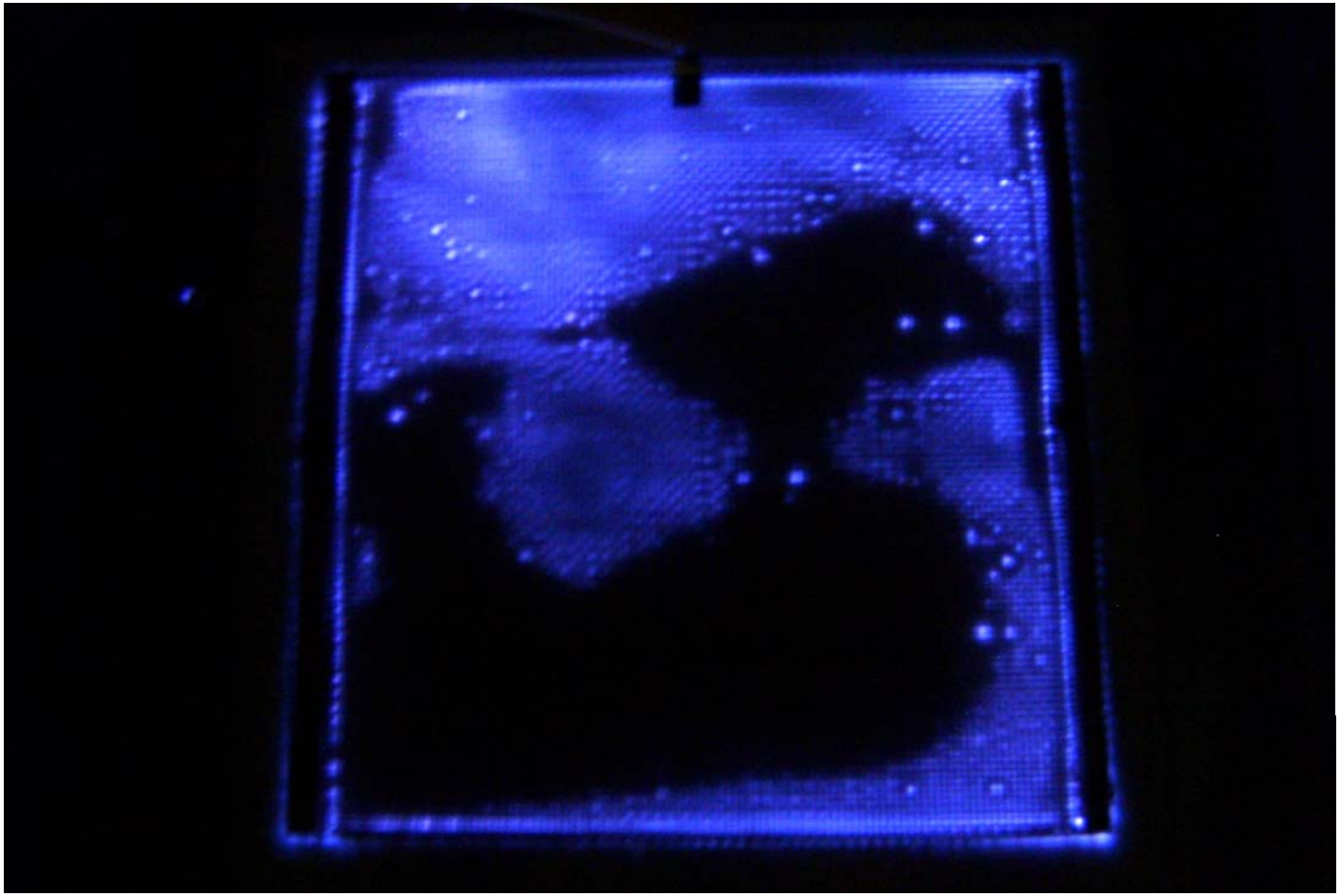

Figure 7: Focused spot discharges on a ceramic barrier material (surface view)

Degradation of different substances

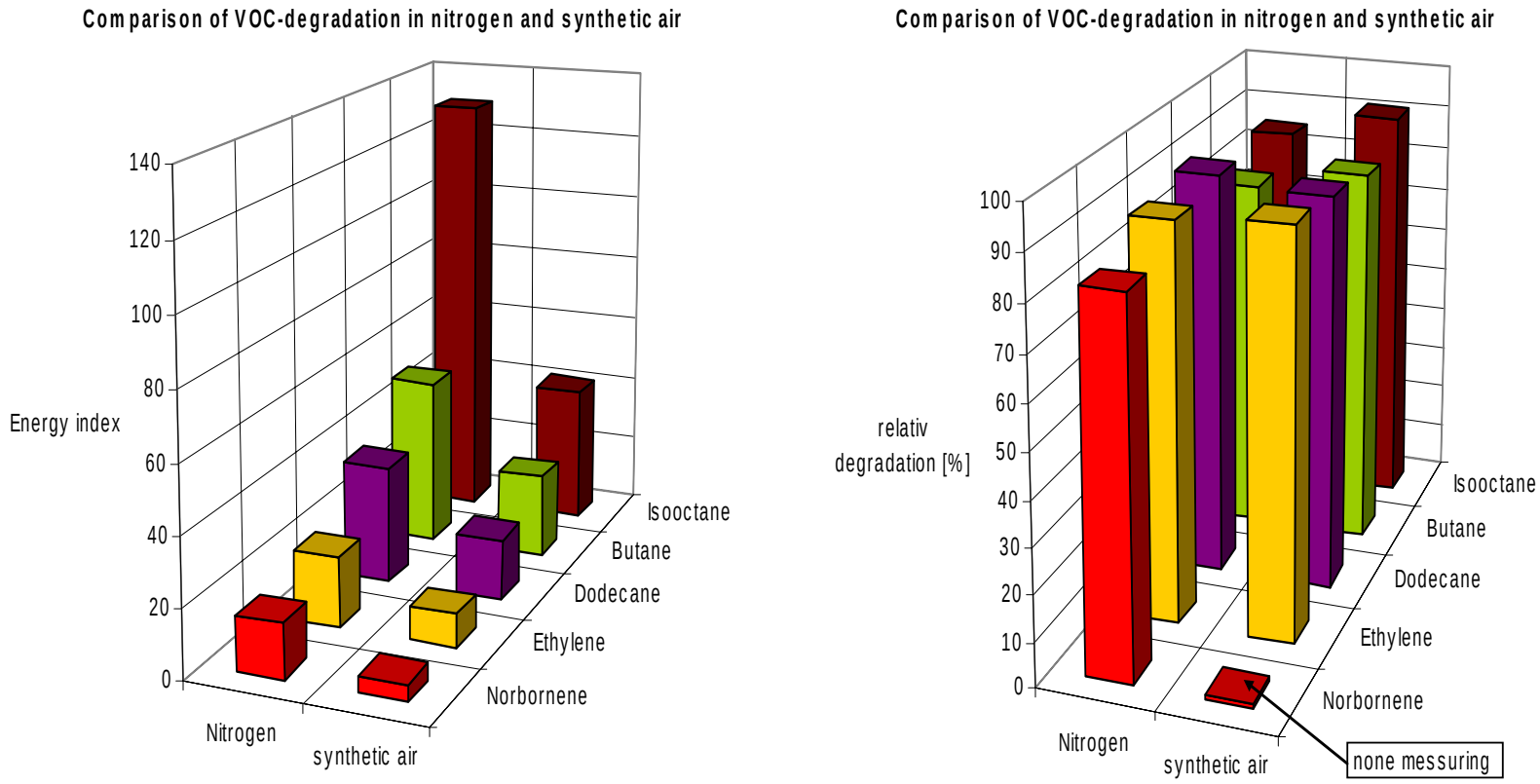

Figure 8: Degradation of different substances and specific energy demand

Hair-pin discharging vessel

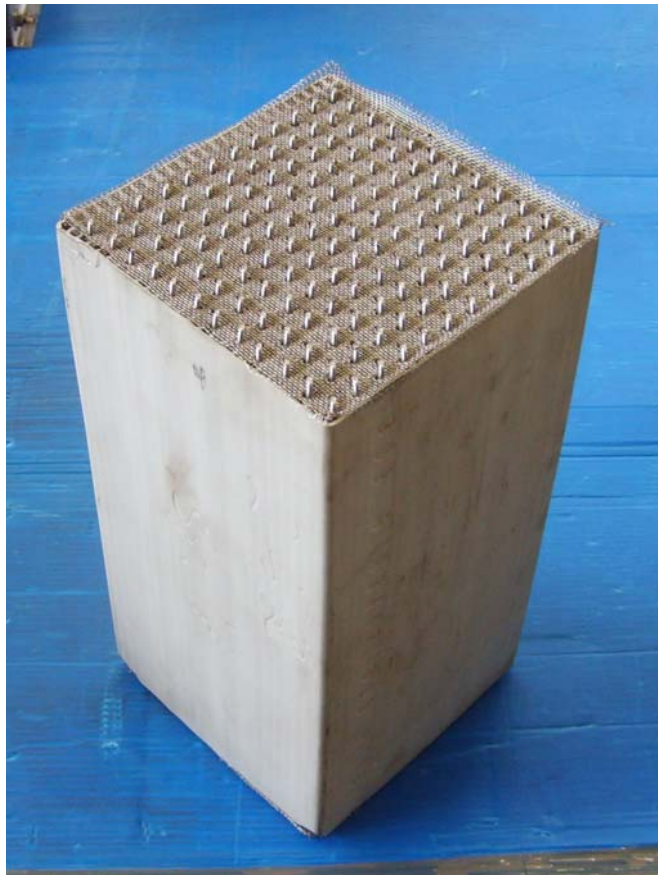

Figure 9: Hair-pin discharging vessel with titanium dioxide combs for using catalytic after-reactions

Efficiency of plasma sources

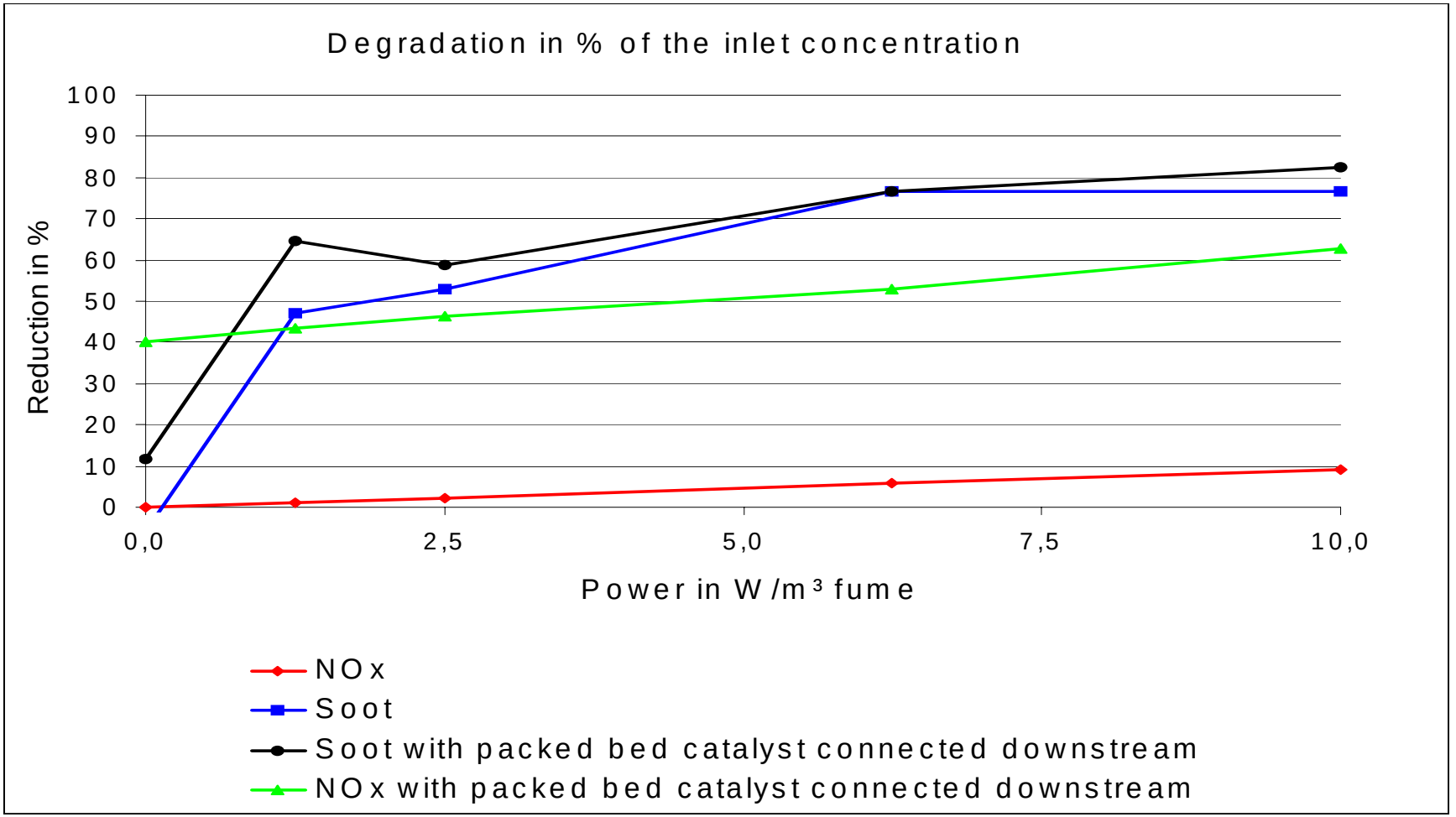

Figure 10: Efficiency of plasma sources for treating fumes (diesel exhaust air)

Catalytic supported NTP plant for 10,000 m³/h of waste air

Figure 11: Catalytic supported NTP plant for 10,000 m³/h of waste air behind flavouring processes for food

Results of the degradation of odour behind oil mills

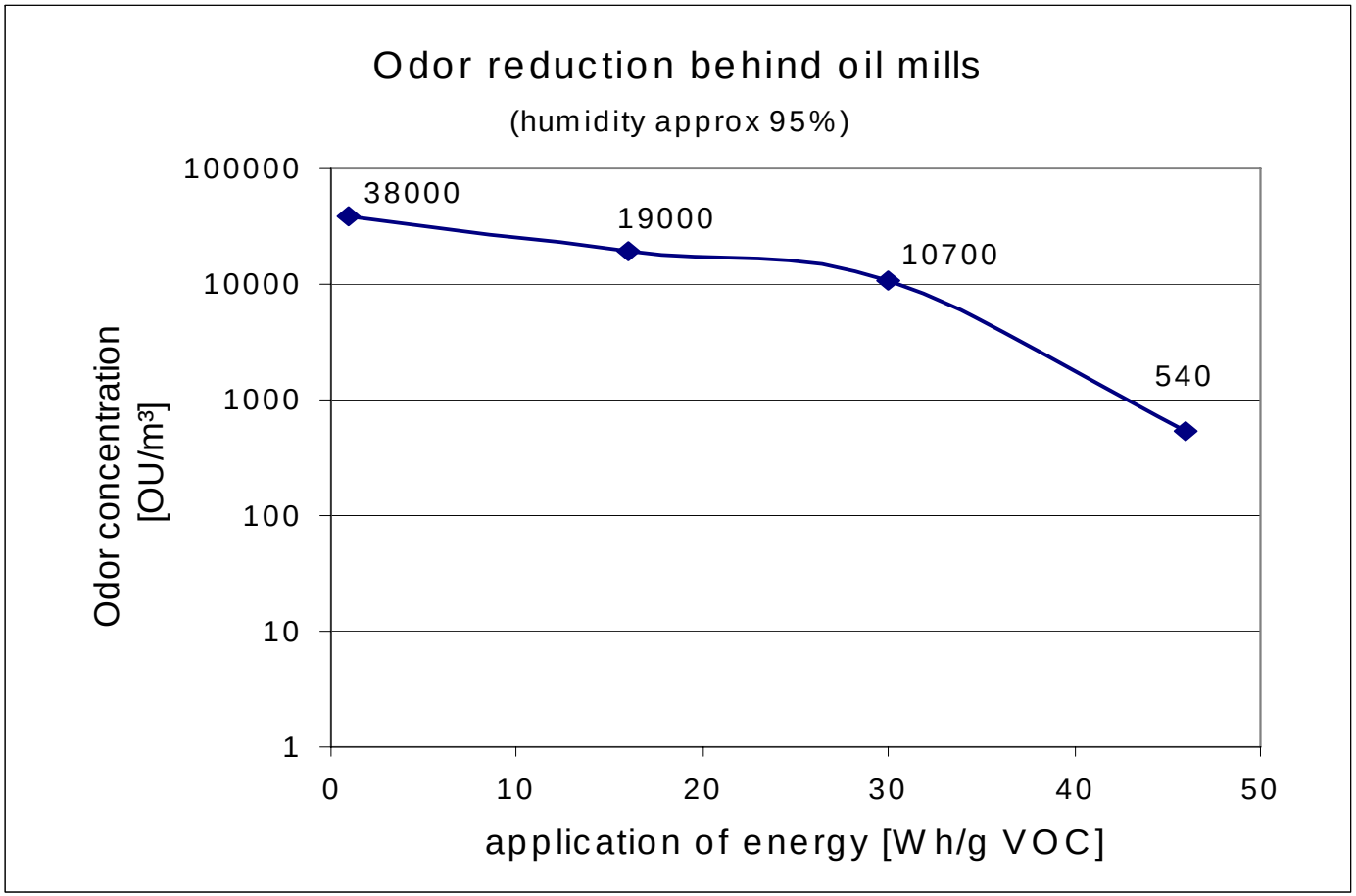

Figure 12: Results of the degradation of odour behind oil mills (without catalyst)

Results of the degradation of odour behind fattening food production

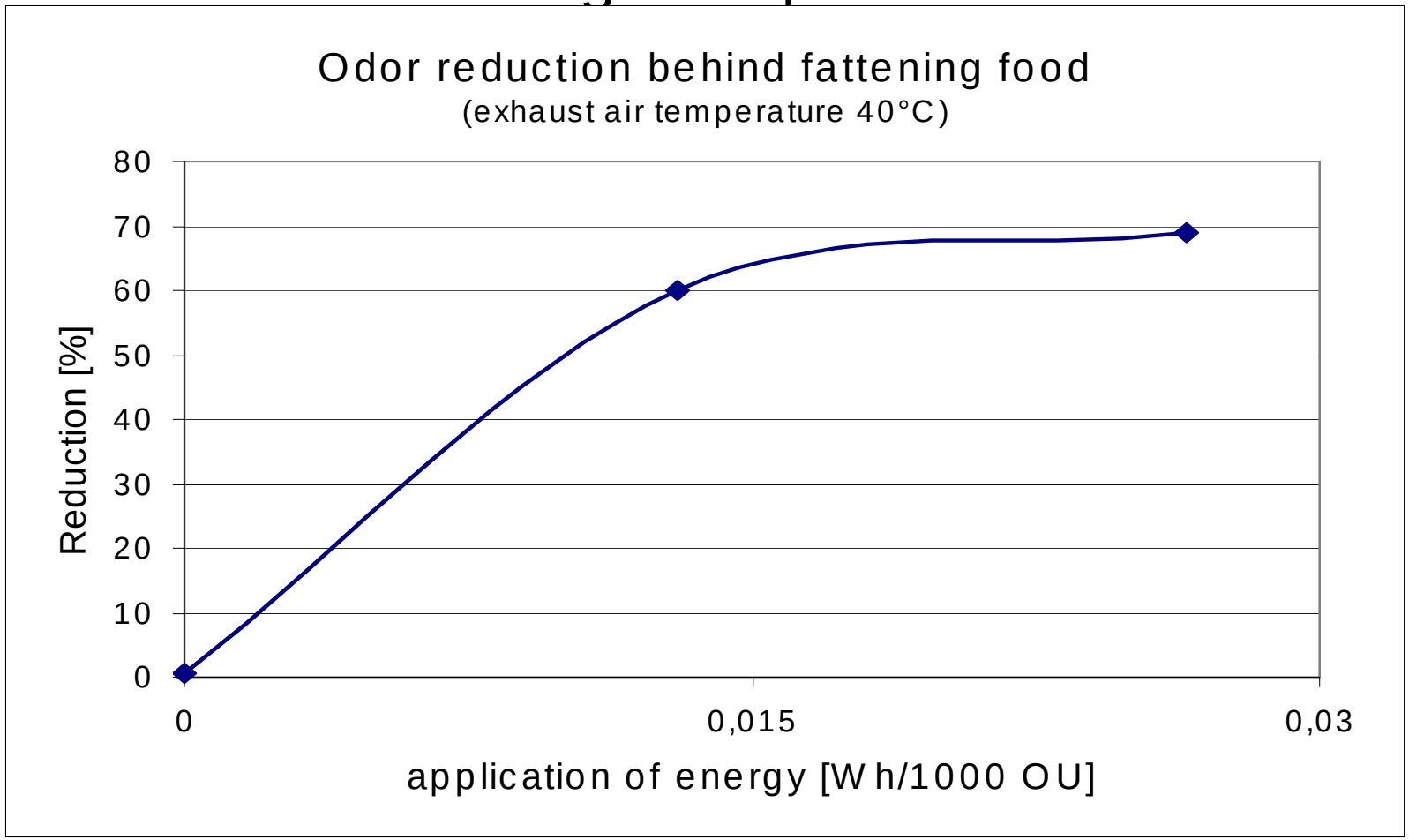

Figure 13: Results of the degradation of odour behind fattening food production processes (without catalyst)

Diagram of a NTP plant

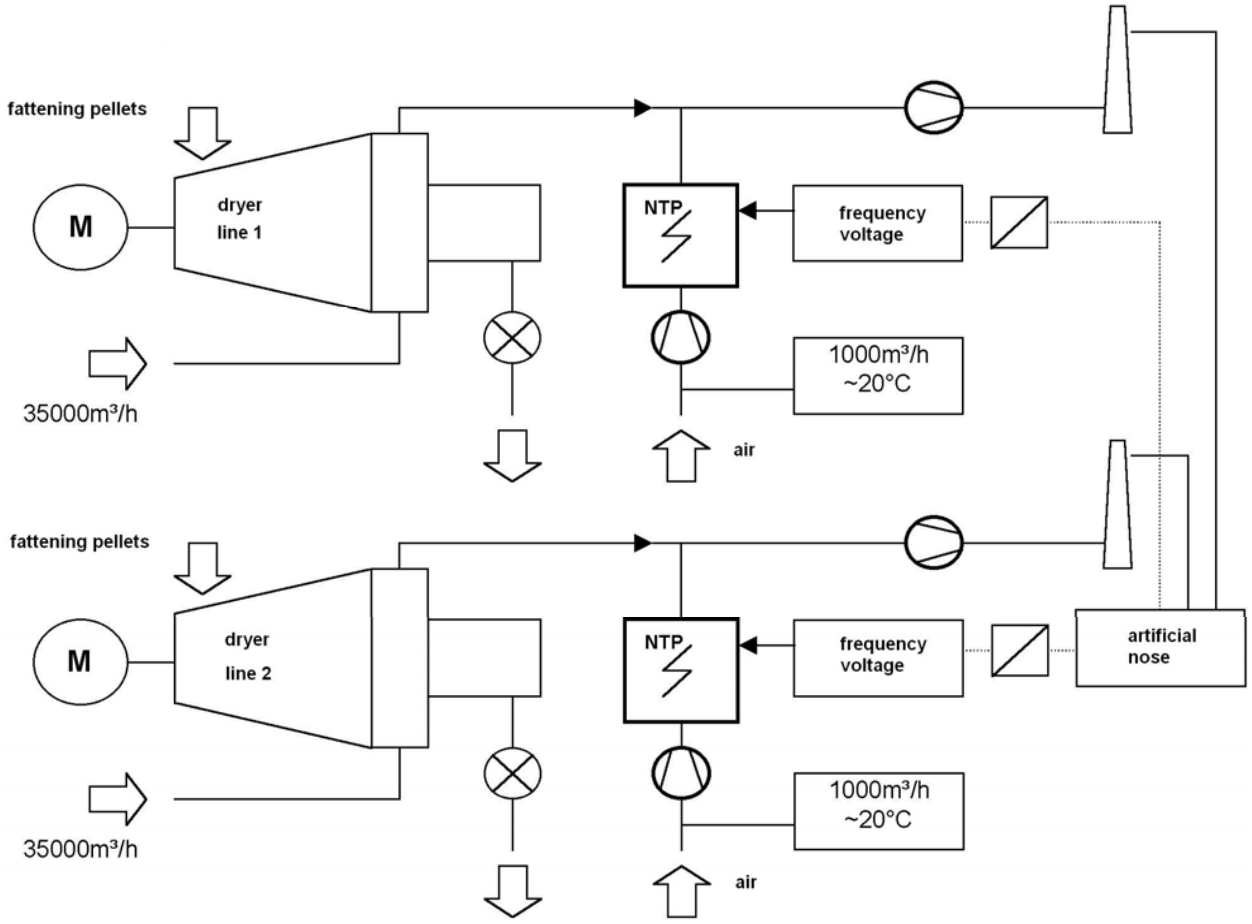

Figure 14: Diagram of a NTP plant for odour reduction in factories for producing fatting food and fish meal (very humid emissions)

Investment- and running costs

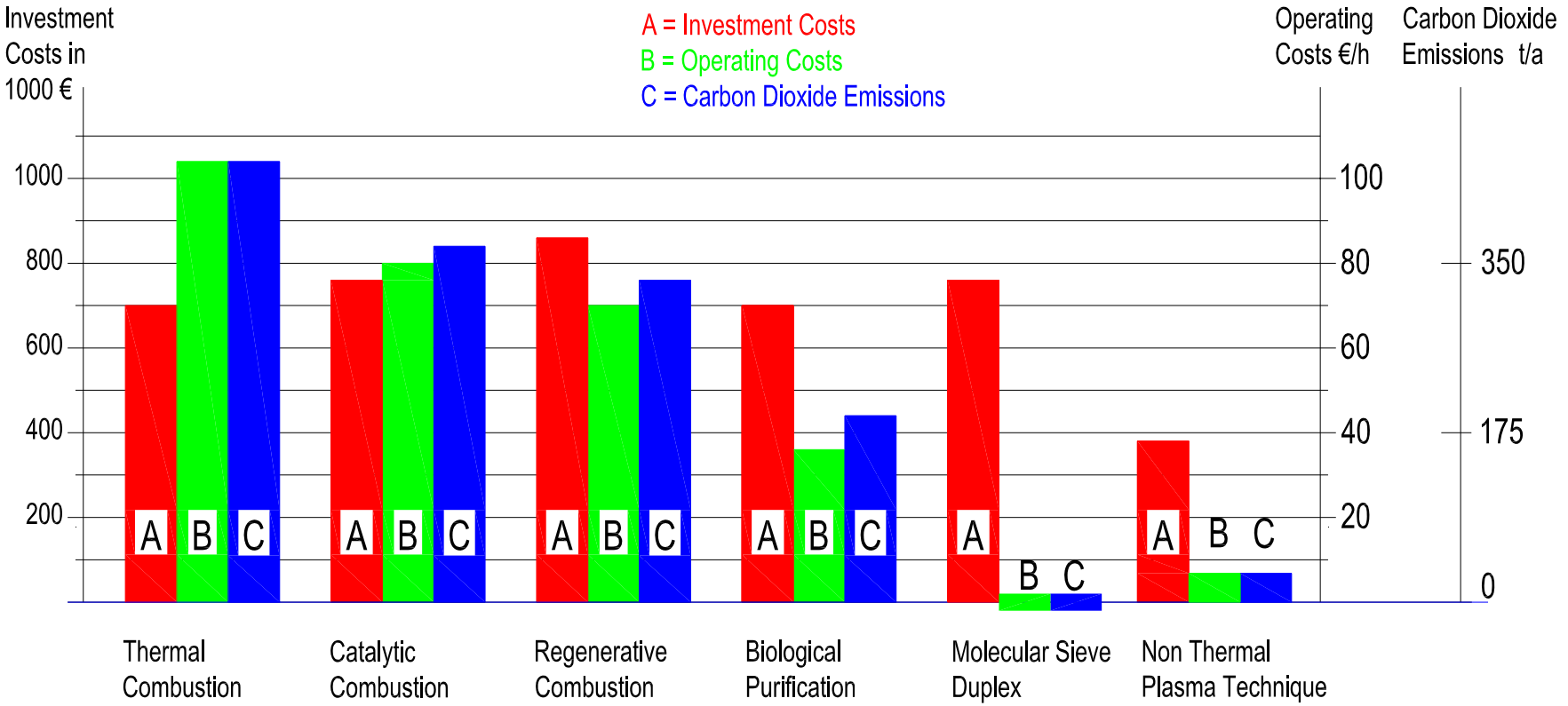

Figure 15: Investment- and running cost comparison of waste air purification processes (50,000 m³N/h) for <100 mg VOC/m³ in the flavour processing industry

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Thank you for your attention