



**TRANSFORMER-LIFE-MANAGEMENT
CONFERENCE**

Drying of Transformers in the Field with Vaporphase, low frequency, or oil spray process

Mr. Matthias Bommel, Meier Prozesstechnik GmbH



- working at MEIER since 2009
- supporting the sales team worldwide
- Product Specialist Transformer Drying Technology

Mr. Tobias Ladermann, Meier Prozesstechnik GmbH




- working at MEIER for 9 years
- specialized in (Vacuum-/ Pressure-)
- Impregnation Technology and Vacuum Drying
- specialized in Sales over the past 4 years
- responsible for Sales in the Middle East Area









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INNOVATION BASED ON TRADITION

Welcome to Meier Group

<p data-bbox="320 804 504 851">Meier Prozesstechnik GmbH</p> <p data-bbox="320 898 467 934">Innovation based on tradition</p> <p data-bbox="320 949 504 1106">Over 30 years international experience and knowledge in plant engineering done in close partnership with the Electrical Engineering Industry results in the latest and most suitable technologies applied in the impregnation process of electric products.</p>  <p data-bbox="328 1191 496 1207">www.meier-prozesstechnik.com</p>	<p data-bbox="557 804 724 851">DVA Holland-Merten GmbH</p> <p data-bbox="557 898 675 934">Your process our challenge</p> <p data-bbox="557 949 740 1106">DVA Holland-Merten as a long-standing company of mechanical and plant engineering provides its partners especially in the sectors of chemicals / pharmaceuticals, organics / food, environmental technology and ores / minerals / building materials solutions for their processes</p>  <p data-bbox="596 1191 700 1207">www.dva-gmbh.com</p>	<p data-bbox="793 804 960 851">Airtec Thermoprocess GmbH</p> <p data-bbox="793 898 956 934">Your Partner for thermo process technology</p> <p data-bbox="793 949 976 1070">Design, development and production of tailor-made concepts for the thermal treatment of sensitive components and equipment made of a wide variety of materials for all types of application.</p>  <p data-bbox="825 1191 944 1207">www.airtec-gmbh.com</p>	<p data-bbox="1029 804 1197 851">Meier Anlagenservice GmbH</p> <p data-bbox="1029 898 1197 934">Your Full-service partner</p> <p data-bbox="1029 949 1212 1093">As a full-service partner Meier Anlagenservice GmbH provides you with high-quality maintenance, repair and overhaul of your vacuum pumps. Take advantage of our expertise to maintain the availability, service life, quality and cycle-time potential of your vacuum pumps at the highest level.</p>  <p data-bbox="1037 1191 1204 1207">www.meier-anlagenservice.com</p>
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Drying of Transformers

with Vapour Phase, Low Frequency or Oil Spray Process

by Meier Prozesstechnik GmbH





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About Meier Prozesstechnik GmbH

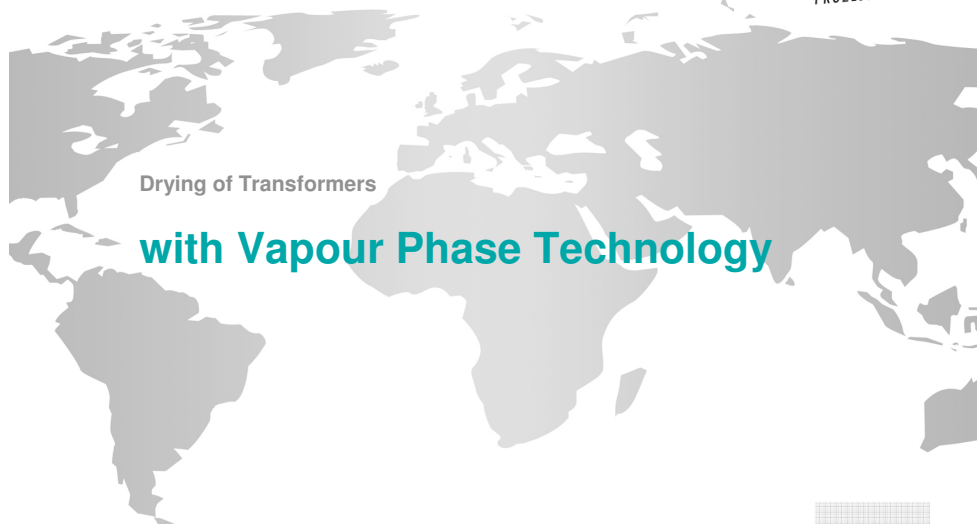
- located in Bocholt, Germany
- owned by Mr. Aloys Meier himself
- about 100 employees, about 250 within the Meier-Group
- more than 30 years of international experience
- system solutions for the electrical industry
- close partnership to the electrical industry
- tailor-designed systems to customers needs – made in Germany

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Advantages of Vapour Phase Drying Technology



- Most efficient method for power transformers from 100 MVA up to the top range
- Energy saving due to shorter and more efficient drying method
- Less depolymerisation of insulation paper due to drying under vacuum
- Cleaning of the active part from old transformer oil during heating up and drying
- Less residual moisture in the insulation - compared to conventional drying (<0,3%)

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Difficulty of Vapour Phase Drying Technology

Due to the supplied solvent vapour (kerosine), dangerous situations may occur

Solution

Safety measures for plants operating with explosive media are available and minimize the risks. Meier Prozesstechnik has been developing and using these safety measures for years.

Official Certificate from DEKRA



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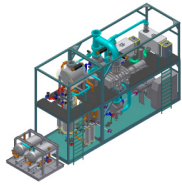


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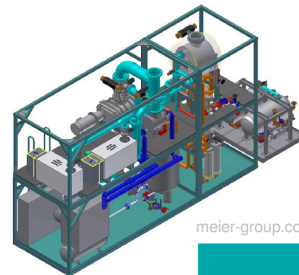
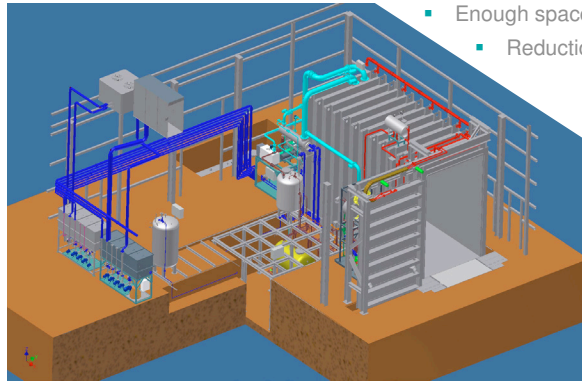
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Features of Vapour Phase Equipment, example given:



- New Design approved
 - Completely preassembled
 - Only small pit necessary
- Enough space for maintenance
- Reduction of installation time



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Vapour Phase Equipment



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Vapour Phase Equipment



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Drying of Distribution Transformers and Field Drying of Power Transformers

with Low Frequency Technology





Drying of Transformers in the Field with Vaporphase, low frequency, or oil spray process

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Advantages of Low Frequency Drying Technology



- Most effective drying method for distribution transformers up to 2,5 MVA
- Energy saving due to heating up windings and insulation material only
- Short process time and with this, workshop place saving
- Less depolymerisation of insulation paper (due to drying and filling under vacuum, without aeration)
- Clean process
- Applicable for drying of power transformers in the field

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Features of Low Frequency Equipment



- Tailor-designed autoclaves
- Regulation of oil filling speed
 - corresponding pipelines will be emptied automatically after filling
- Quick-Connectors (for copper bus bars and LF cables)
- Control of the dryness is done with a pressure rising test
- Provision of preheated dry air from the compressed air supply
 - to prevent corrosion on the core and the transformer housing
- Winding-temperature is calculated from the measured resistance of the winding
- Integration of a DC-measurement in addition to the AC-Measurement system:
 - for checking the AC measurement
 - characterised by high quality and accuracy
 - comparable with the measurement system of a testing field
- Manually, semi- or fully automatic process possible
- Quality Management System to record all process steps

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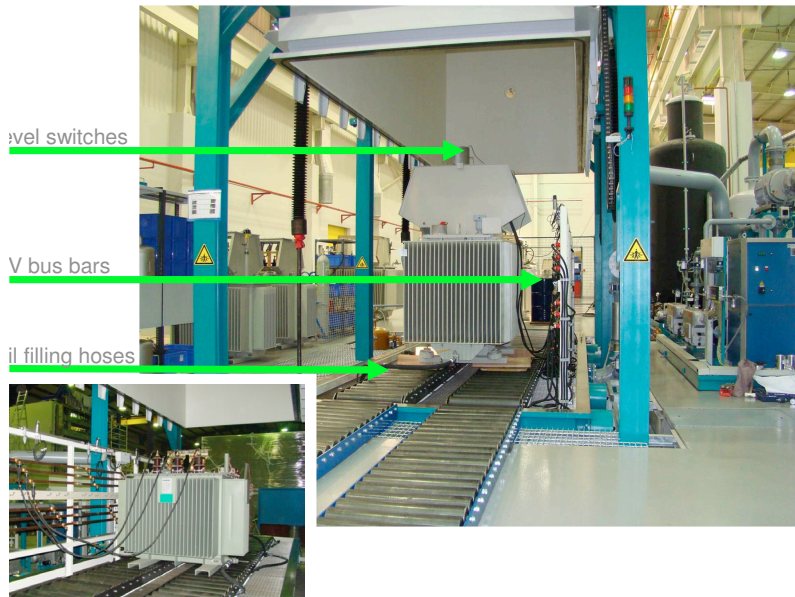


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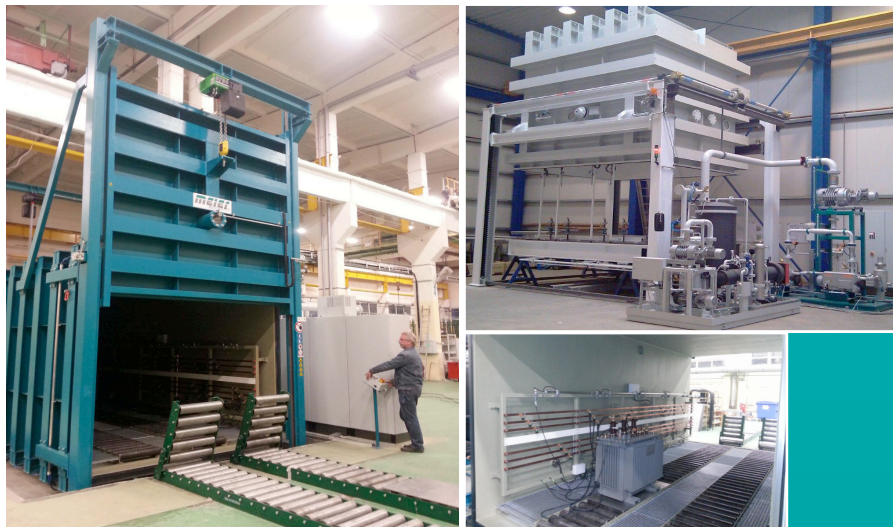
Features of Low Frequency Equipment, example given:



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Low Frequency Equipment



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Corresponding equipment for reprocessing and drying of transformers by
Oil Processing Systems

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Features of Oil Processing Systems

- Stationary systems for fabrication (throughput up to 25,000 l/h)
- Mobile systems for service (throughput up to 12,000 l/h)
- Single and multi-level systems accordings to customer requirements



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Meier Prozesstechnik GmbH

Vennweg 8 | D-46395 BOCHOLT/Germany

Phone: +49 (0) 28 71 / 2 19 27-0 | Fax: +49 (0) 28 71 / 2 19 27-30

info@meier-prozesstechnik.de | www.meier-group.com

Contact Sales Middle East Area

Mr. Tobias Ladermann | Sales Manager

Phone: +49 (0) 28 71 / 2 19 27-0 | Fax: +49 (0) 28 71 / 2 19 27-0

E-Mail: tobias.ladermann@meier-prozesstechnik.de | www.meier-group.com

