

Looking at the big picture.



SEMINAR



# Vibrations & Pulsations in LDPE Plants

26 and 27 June 2019 in Rheine/Germany

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## Agenda (preliminary)

### 1. Introduction

- LDPE process
- Why do vibrations matter in LDPE plants?
  - Reliability
  - Availability
  - Maintainability
  - Safety

### 2. Theoretical Basis

- Vibrations
  - Fatigue
  - 1-DOF systems
    - Stiffness, mass, damping
    - Amplitude and phase
    - Transfer functions
  - MDOF systems
    - Operational deflection shapes
- Pressure Pulsations
  - Wave propagation inside piping
  - Standing waves and acoustic resonances
- Dynamic Forces and Moments
  - Machine related
  - Flow related
  - Interaction of machines

### 3. Equipment Specific Vibration Issues

- Hyper Compressor
- Booster/Primary Compressors
- Intercooler and Reactor
- Pipe Supports
- Small Bore Connections

### 4. Assessment

- Pressure Pulsations
  - API standard 618 5th edition
  - Vendor/Licensor specific pulsation limits
- Machinery & Foundation Vibrations
  - ISO 10816 – Part 8
  - Vendor specific vibration limits
- Pipeline Vibrations
  - VDI guideline 3842
  - Energy Institute guideline

Impressions of Rheine (Rheine City, KÖTTER Consulting Engineers, Nature park with saltworks)



## 5. Mitigation Measures

- Measures for reducing pulsations in low and high pressure piping
- Measures for reducing structural vibrations at piping, structural steel, machinery foundation etc.

## 6. Case Studies

- Investigation of elevated foundation vibrations of a hyper compressor
- Mitigation of discharge pipe bend vibrations of a hyper compressor
- Vibration optimization of a primary compressor
- Investigation and mitigation of intercooler/reactor vibrations

*If you have special fields of interest please let us know. We look forward to receiving and implementing your ideas.*

## Seminar trainers



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Enjoy our region "Münsterland": Castle Nordkirchen, typical landscape, Historical old town of Münster



# Vibrations & Pulsations in LDPE Plants.

## 2-Days-Seminar – all inclusive

### Registration

**Fee:** EUR 1.900,00 plus 19% VAT  
**Early Bird:** EUR 1.800,00 plus 19% VAT  
Registration until 31<sup>st</sup> December 2018

The fee is including all seminar documents, catering during two days, evening dinner and hotel costs

**Our Service:** We book the hotel room for you.  
Our KCE-shuttle takes you from the hotel to the KCE-Academy and back.



All participants are accommodated in the Park Hotel Surenburg.

**Registration:**  
Please send an email with contact data to [ldpe-seminar@koetter-consulting.com](mailto:ldpe-seminar@koetter-consulting.com)

**Seminar venue:**  
KÖTTER Consulting Engineers  
GmbH & Co. KG · KCE-Academy  
Bonifatiusstraße 400 · 48432 Rheine · Germany

**Contact:**  
For all questions regarding registration and organisation please contact



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