PRÜFTECHNIK

**PRUFTECHNIK ServiceCenter**

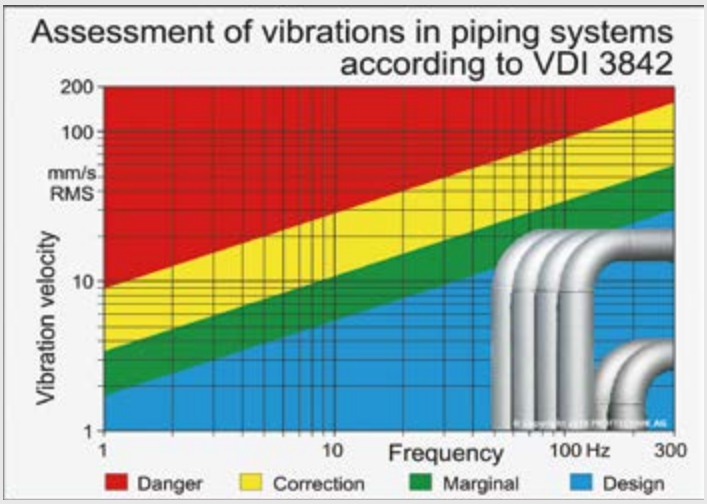
# How Safe Are Your Piping Systems? Video-based vibration Analysis.

- Identify causes of leaks
- Three-dimensional detection of vibration stresses
- Apply stiffeners / dampers in a targeted manner
- Perform ODS analysis on pipelines

MEASURE, EVALUATE, AND REDUCE VIBRATIONS

# VIB 2.1 – Measure vibrations, asses and reduce specifically

If piping systems is experiencing 24 oscillations per second, this means 820 million load cycles per year, which can lead to fatigue failure if the permissible amplitudes are exceeded. Too high vibration stresses can also lead to premature fatigue fractures. By measuring the vibration velocity, dynamic stresses in piping systems can be directly evaluated, since vibration velocity and dynamic stress are proportional to each other. VDI 3842 contains orientation values for permissible pipe vibrations, which have proven useful petrochemical industry. Below figure reveals, that frequency-related measurement is required. Additionally, small amplitudes are more involved in potential damages in the case of low-frequency vibrations.




PRUFTECHNIK carries out both video-based and sensor based vibration analyzes on pipeline systems in order to recognize, understand and purposefully reduce impermissible vibration phenomena and to identify how they are influenced by the mode of operation at a given time.

Video image for detailed analysis in a biogas plant

Sensor on a refregeration compressor

## THE PROCEDURE FOR VIDEO ANALYSIS

- **Selection**
  A suitable place for video camera and adjustment.
- **To Identify**
  Some characteristic fixed points.
- **Configure**
  The measurement program.
- **Record**
  A 30-second video at each load level.
- **To Calculate**
  Displacement and Velocity FFTs
- **Evaluate**
  The dominant degree of freedom and Create filtered motion videos.
- **Analysis**
  The vibration stresses.
- **Establish**
  Measures for vibration reduction.
- **Special Analysis**
  To determine the cause of damage (multi-dimensional orbit, time and phase analyzes).
- **Choose**
  From measurement points for long-term measurements with acceleration sensors.



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PRÜFTECHNIK
Condition Monitoring GmbH
Oskar-Messter-Str. 19-21
85737 Ismaning, Germany
Tel.: +49 89 99616-0
Fax: +49 89 99616-200
service@pruftechnik.com
www.pruftechnik.com
A member of PRUFTECHNIK group

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