

# PIEZO TECHNOLOGY COURSE 2008

at High Tech Campus, Eindhoven

24<sup>th</sup> and 25<sup>th</sup> of November 2008

Organized by HEINMADE

Last year successful piezo technology course will be continued in a new and unique form. Both **Nanomotion** and **Piezomechanik** will be added to the outstanding **Noliac** piezo course. Making it a joined effort of all companies **HEINMADE** represents:

**Noliac** will cover aspects related to production, quality, piezo materials, actuators, sensors, generators, transducers and integrating components.

**Nanomotion** will open the world of applying piezo motors with unlimited travel from a single up to 7 DOF. By revealing several unique high resolution motion control solutions the design rules are covered.

**Piezomechanik** will focus on encaged actuator solutions for precision motion control in various exotic fields and related electronic supplies.

The high level and open atmosphere at the High Tech Campus will help a common understanding and raises opportunities to make significant steps for present and future development projects.

## After the course you have :

- Tools to select **piezo materials** for different applications. For example in relation to operating conditions and reliability
- An overview of actuator types, **motor options**, **electronic supplies** and **mechatronic drive controls**
- Tools to estimate **performance** of different types of actuators
- An overview of **processes** used to make piezo components
- Understanding of **failures and defects**
- Knowledge about **how to use** piezo actuators and sensors in applications
- Knowledge about how to **design in piezo motors** and how to **program the drive control**
- Knowledge about **generator types** and tools to calculate **energy extraction**
- Knowledge about selecting the **right type of actuator** and calculating the **needs for electronic drives**
- Knowledge about **final inspection** tests and **Quality Assurance**
- An understanding of **thermal impact** on performance
- An understanding of the **design rules**
- The ability to **discuss in details** with piezo vendors



## Course will cover :

- **Materials;** History of piezoelectric materials, Basics of piezo theory, PZT material classes, properties, limitations and applications
- **Manufacturing;** PZT material manufacturing, Bulk and multilayer PZT manufacture and typical process limitations
- **Quality assurance;** Quality assurance in PZT manufacture
- **(Encaged/Stacked) Actuators;** Piezoelectric actuators and applications, Design examples
- **Sensors, Generators and Transformers;** Piezoelectric sensors, generators, transformers and their applications
- **Motors and stages;** Piezo motors and stages applications, design examples
- **Amplifiers;** Actuator and motor amplifiers and limitations
- **Drive control;** Actuator and motor closed loop drive controls
- **Demo's;** Demo's of actuators, motors, stages, amplifiers and drive controls



Electronic supplies and encaged stack actuator  
[www.piezomechanik.com](http://www.piezomechanik.com)

### Typical participants :

Designers, technical staff, research engineers, who wish to be introduced to piezo technology and to gain better understanding of:

- Material parameters and performance
- Performance and possible designs with bulk and multilayer technologies
- The electrical outputs from different designs, i.e. layer height and cross sections
- Production processes in bulk and multilayer manufacturing.

### Attending the course provides you with :

- 2-day intense piezo technology course
- Examples - learning by doing
- A proper start with do's en don'ts
- Informal discussions during lunches and dinner
- Benefit from networking with attending companies

### Course dates :

The course is scheduled for the **24<sup>th</sup> and 25<sup>th</sup> of November 2008** at the High Tech Campus Eindhoven each day from 9.00 hrs till 18.00 hrs.

These dates are chosen to combine the course with visiting the **Precision Fair** the 26<sup>th</sup> and 27<sup>th</sup> of November 2008. The precision fair is held in Veldhoven ([www.precisiebeurs.nl](http://www.precisiebeurs.nl)). During the fair **HEINMADE** can be found at the Piezo boulevard.

### Where :

The course is hosted by **HEINMADE** at the High Tech Campus in Eindhoven. Towards Eindhoven follow directions High Tech Campus. **HEINMADE** is based in building 9 (use parking P0).

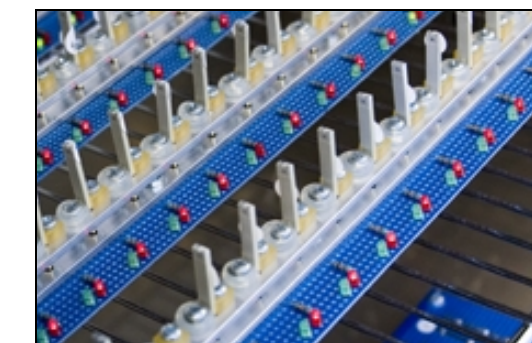
### Course fee :

Price: € 995.-- excluding VAT.

Price includes lunches, dinner on first day, coffee and soft drinks, course material and samples.



Single axis auto focus closed loop system  
[www.nanomotion.com](http://www.nanomotion.com)



Multiple bender qualification test rig  
[www.noliac.com](http://www.noliac.com)

### Signing up :

- Signing up is done by sending your purchase stating Piezo Technology Course 2008 to **HEINMADE**. Payment terms 30 days.
- Unsubscribing the course is free of charge until 3 weeks before the start of the course.
- When unsubscribing the course less than 3 weeks before the start of the course, 100% of the price of the course will be charged.
- A colleague may attend the course replacing the subscribed person.
- Forward your application ideas before the course and let us prepare ourselves for a detailed discussion during the breaks. Please send your thoughts to [info@heinmade.com](mailto:info@heinmade.com) or contact us directly.

Questions? Send e-mail to [info@heinmade.com](mailto:info@heinmade.com)