

# CONVAL<sup>®</sup> 8 New Features

## **General, non-module-specific improvements**

CONVAL 8 is compatible with Microsoft<sup>®</sup> Windows<sup>®</sup> 7.

### **Interface**

- The Export of calculation was improved and simplified.
- With gases at standard conditions besides molar mass, standard density and specific gas constant the specific gravity can be given.
- In the substance selection dialog the aliases of the selected fluid can be shown.
- New pressure unit *kgf/cm<sup>2</sup>* and for liquid density *specific weight*.
- Graphics exports as wmf, bmp, jpg and pdf files.
- An auto-save function allows to recover calculations after an abnormal program termination of CONVAL.
- The performance of the dependency graphs was optimized for multi processor systems and multi kernel processors.
- In the dependency graphs a history list and incremental parameter search was introduced.
- When changing the pipe class from metric to ANSI and vice versa the nominal size and pressure class was converted.

### **Substances**

- Improved density calculation of liquids from the substance database.
- The calculation of mixtures according to new **GERG2004 XT08** in the liquid phase, in the gaseous phase, or for two-phase systems. Apart from an improved computing speed and stability the GERG2004 was expanded with further components.
- For many fluids the specific isobar heat capacity was added, which allows to calculate the density at two-phase conditions.

### **Materials**

- The material database was enhanced by some plastics.
- For many materials new data for thermal conductivity, density, and elasticity modulus were added.
- The pipe database was enhanced by large ANSI pipe sizes.

## **Module-specific improvements**

### **Safety valves**

- CONVAL 8 calculates the rated mass flow for safety valves according to:
  - **\_ AD Specification A2**
  - **\_ ISO 4126-1:2004**
  - **\_ API 520:2008**
  - **\_ ASME:2004 Section VIII**
- The calculation of two-phase systems including flashing liquids is according to the Omega Method in API 520:2008
- The calculation of the built-up backpressure of the discharge pipe with up to four pipe extensions and the pressure loss of the feeding pipe according to **ISO 4126-9:2008**.
- The calculation of reaction forces and the noise level for gases according to **ISO 4126:9-2008**.

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## Differential pressure flow elements

The following differential pressure flow elements and calculation standards are supported by CONVAL 8:

- **ISO 5167** for corner orifice plates, D and D/2 orifice plates, flange orifice plates, ISA 1932 nozzles, long-radius nozzles, Venturi tubes und Venturi nozzles.
- **ISO/TR 15377** for quarter circle nozzles, conical entrance orifice plates, eccentric orifice plates, and orifice plates with drain holes.
- **ISO 9300** for critical flow Venturi nozzles
- **VDI/VDE 2041** for segmental orifice plates and quarter circle nozzles
- **ASME MFC-7M** for corner orifice plates, D and D/2 orifice plates, flange orifice plates, ISA 1932 nozzles, long-radius nozzles, Venturi tubes und Venturi nozzles.
- **ASME PTC 6** for ASME PTC 6 nozzles
- **Pitot tubes** with selection of a manufacturer database
- Special differential pressure flow elements Rosemount 405 C, Rosemount 405 P, and Rosemount 1595
- Orifice with **2.5D and 8D pressure taps** according to R. W. Miller, "Flow Measurement Engineering Handbook," Third Edition.
- Unspecified non-standard orifice flow meters

## Control valves

The most important innovations are:

- Improved user interface for entering up to three operating points.
- Analysis of the controllability using the characteristics to optimize the dynamic control and to find the optimal tuning point for positioners.
- Better Cv100 suggestion taking into account the plant system.
- Standard values for double and triple eccentric butterfly valves.
- Prediction of the aerodynamic noise level according to **IEC 60543-8-3:2008 (Draft)**
- Restricted stroke or angle for control valves (reduced Cv100).
- Export to an English or German data sheet (Excel) according to **IEC 60543-7**.
- New in the database: Fisher GX series.

## Tank depressurization

- Different noise prediction standards can be selected.

## Restriction orifice plate

- Orifice plates with drain holes can be calculated.
- The range of validity had been enhanced to  $\beta > 0.75$ .
- Flow velocities are calculated.