

COURSE OVERVIEW ME0489

Inspect and Maintain Safeguarding Vent and Relief Systems

Course Title

Inspect and Maintain Safeguarding Vent and Relief Systems

Course Reference

ME0489

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	May 05-09, 2024	Oryx Meeting Room, Doubletree By Hilton Doha-Al Sadd, Doha, Qatar
2	August 11-15, 2024	Kizkulesi, Crown Plaza Istanbul Asia Hotels & Convention Center, Istanbul, Turkey
3	December 09-13, 2024	Hampstead Meeting Room, London Marriott Hotel Regents Park, London, United Kingdom
4	January 12-16, 2025	The Kooh Al Noor Meeting Room, The H Dubai Hotel, Sheikh Zayed Rd - Trade Centre, Dubai, UAE

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



This course is designed to provide participants with a fundamental overview of Inspect & Maintain Safeguarding Vent & Relief Systems. It covers the key purpose and operation of safeguarding vent and relief systems; the equipment safety and operational efficiency; the types of safeguarding vent and relief system devices; the devices specific to the location, common devices used globally and the function and application of each device; the parts and roles of system components in the overall system and the maintenance requirements for each component; the typical operating parameters/limits; and the safe isolation procedures and equipment/plant for inspection.



During this interactive course, participants will learn the inspection methodologies and procedures; the routine checks and use of tools, devices and software for inspection; the technical drawings, specifications and their importance in installation and maintenance; the scheduled maintenance versus need-based maintenance; the regular system checks, documentation and safe isolation and inspection; the new and emerging technologies in the field; the system components and safety protocols; and emergency responses, documentation and compliance.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a basic knowledge on inspect and maintain safeguarding vent and relief systems
- Explain the tasks related to inspect and maintain safeguarding vent and relief systems
- Explain the key purpose of and how a safeguarding vent and relief system operates
- Demonstrate safe isolation of equipment/plant for the inspection of safeguarding vent and relief systems
- Explain what types of safeguarding vent and relief system devices used at own location and explain their function
- Explain the typical operating parameters/limits for safeguarding vent and reliefs systems
- Demonstrate the correct installations of safeguarding vent and relief systems from drawings and specifications
- Discuss the key purpose and operation of safeguarding vent and relief systems
- Maintain equipment safety and operational efficiency
- Recognize the types of safeguarding vent and relief system devices as well as the devices specific to the location, the common devices used globally and the function and application of each device
- Identify the parts and roles of system components in the overall system and the maintenance requirements for each component
- Discuss the typical operating parameters/limits and apply safe isolation procedures and equipment/plant for inspection
- Carryout inspection methodologies and procedures including routine checks and use of tools, devices and software for inspection
- Read and interpret technical drawings as well as the specifications and their importance in installation and maintenance
- Differentiate scheduled maintenance versus need-based maintenance and apply regular system checks and documentation
- Employ safe isolation and inspection and discuss the new and emerging technologies in the field
- Calibrate and test system components as well as implement safety protocols, emergency responses, documentation and compliance

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials, course conveniently saved in a **Tablet PC**.

Who Should Attend

This course provides a fundamental overview of the inspection and maintenance of safeguarding vent and relief systems for engineers, maintenance technicians, safety personnel, operations personnel, compliance and regulatory personnel, managers, supervisors, environmental specialists and health and safety inspectors.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee


Doha	US\$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	US\$ 6,000 per Delegate + VAT . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
London	US\$ 8,800 per Delegate + VAT . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day
Dubai	US\$ 5,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -


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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council for Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Andrew Ladwig is a **Senior Process & Mechanical Engineer** with over **25 years** of extensive experience within the **Oil & Gas, Refinery, Petrochemical & Power** industries. His expertise widely covers in the areas of **Ammonia Manufacturing & Process Troubleshooting, Distillation Towers, Crude Oil Distillation, Fundamentals of Distillation** for Engineers, **Distillation** Operation and Troubleshooting, **Advanced Distillation** Troubleshooting, **Distillation** Technology, **Vacuum Distillation, Ammonia Storage & Loading** Systems, **Ammonia Plant** Operation, Troubleshooting & Optimization, **Ammonia Recovery, Ammonia Plant Safety**, Hazard of **Ammonia Handling**, Storage & Shipping, **Operational Excellence in Ammonia Plants, Fertilizer Storage** Management (Ammonia & Urea), **Fertilizer Manufacturing** Process Technology, **Sulphur Recovery**, Phenol Recovery & Extraction, **Wax Sweating & Blending, Petrochemical & Fertilizer** Plants, **Nitrogen Fertilizer** Production, **Petroleum Industry** Process Engineering, **Refining Process & Petroleum** Products, **Refinery Planning & Economics**, **Safe Refinery Operations, Hydrotreating & Hydro-processing, Separators** in **Oil & Gas** Industry, **Gas Testing & Energy** Isolations, Gas Liquor Separation, **Industrial Liquid Mixing, Wax Bleachers, Extractors, Fractionation**, Operation & Control of **Distillation**, Process of **Crude ATM & Vacuum Distillation** Unit, **Water Purification, Water Transport & Distribution, Steam & Electricity, Flame Arrestors, Coal Processing, Environmental Emission Control**, R&D of **Wax Blending, Wax Molding/Slabbing, Industrial Drying**, Principles, Selection & Design, Certified **Process Plant** Operations, Control & Troubleshooting, **Operator Responsibilities, Storage Tanks Operations & Measurements, Process Plant** Troubleshooting & Engineering Problem Solving, **Process Plant Performance**, Efficiency & Optimization, Continuous Improvement & Benchmarking, **Process Troubleshooting** Techniques, Oil & Gas Operation/Introduction to **Surface Facilities, Pressure Vessel** Operation, **Process Equipment** Performance & Troubleshooting, **Plant Startup & Shutdown, Startup & Shutdown** the Plant While Handling Abnormal Conditions, **Flare & Relief** System, **Process Gas Plant** Start-up, Commissioning & Problem Solving, **Process Liquid** and **Process Handling & Measuring** Equipment. Further, he is also well-versed in **Compressors & Turbines** Operation, Maintenance & Troubleshooting, **Heat Exchanger** Overhaul & Testing Techniques, Balancing of **Rotating Machinery (BRM)**, **Pipe Stress** Analysis, **Valves & Actuators** Technology, Inspect & Maintain **Safeguarding Vent & Relief** System, Certified Inspectors for **Vehicle & Equipment**, Optimizing **Equipment Maintenance & Replacement** Decisions, Certified Maintenance Planner (**CMP**), Certified Planning and Scheduling Professional (**AACE-PSP**), **Tank Design**, Construction, Inspection & Maintenance, **Material Cataloguing**, Specifications, Handling & Storage, **Steam Trap** Design, Operation, Maintenance & Troubleshooting, **Steam Trapping & Control, Column, Pump & Exchangers**, Troubleshooting & Design, **Rotating Equipment** Operation & Troubleshooting, **Control & ESD** System, **Detailed Engineering Drawings**, Codes & Standards, **Budget** Preparation, Allocation & Cost Control, Root Cause Analysis (**RCA**), **Production Optimization**, Permit to Work (**PTW**), Project Engineering, **Data** Analysis, **Process Hazard** Analysis (**PHA**), **HAZOP** Study, Sampling & Analysis, **Training** Analysis, **Job Analysis** Techniques, Storage & Handling of **Toxic Chemicals & Hazardous Materials**, **Hazardous Material** Classification & Storage/Disposal, **Dangerous Goods**, Supply Chain, Purchasing, Procurement, **Logistics** Management & **Transport & Warehousing & Inventory**, **Risk** Monitoring Authorized Gas Tester (**AGT**), Confined Space Entry (**CSE**), Personal Protective Equipment (**PPE**), Fire & Gas, First Aid and Occupational Health & Safety.

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer, Project Engineer, Reliability & Maintenance Engineer, Maintenance Support Engineer, Process Engineer, HSE Supervisor, Warehouse Manager, Quality Manager, Business Analyst, Senior Process Controller, Process Controller, Safety Officer, Mechanical Technician, Senior Lecturer** and **Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's** degree in **Chemical Engineering** and a **Diploma in Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met

Day 1

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Overview of Safeguarding Vent & Relief Systems Definition & Purpose • Importance in Industrial Settings
0930 – 0945	Break
0945 – 1030	Key Purpose & Operation of Safeguarding Vent & Relief Systems Role in Maintaining Equipment Safety & Operational Efficiency • Operating Principles
1030 – 1230	Types of Safeguarding Vent & Relief System Devices Devices Specific to your Location • Introduction to Common Devices Used Globally • Function & Application of Each Device
1230 – 1245	Break
1245 – 1420	System Components & their Functions Parts & their Roles in the Overall System • Maintenance Requirements for Each Component
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day One

Day 2

0730 – 0930	Introduction to Typical Operating Parameters/Limits Rationale Behind Set Parameters/Limits • Importance of Adhering to these Parameters
0930 – 0945	Break
0945 – 1100	Interactive Session: Identifying System Components on Site Field Walk to Identify & Understand the Components in a Real-World Setting
1100 – 1230	Safe Isolation of Equipment/Plant for Inspection Procedures & Precautions • Tools & Equipment Required for Safe Isolation
1230 – 1245	Break
1245 – 1420	Inspection Methodologies & Procedures Routine Checks & Comprehensive Inspections • Use of Tools, Devices & Software for Inspection
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Two

Day 3

0730 – 0930	Understanding Drawings & Specifications Reading & Interpreting Technical Drawings • Understanding Specifications & their Importance in Installation & Maintenance
0930 – 0945	Break



0945 – 1100	Demo: Correct Installation from Drawings & Specifications Hands-On Session on System Installation • Identifying Potential Challenges & their Solutions
1100 – 1230	Maintenance Protocols & Best Practices Scheduled Maintenance Versus Need-Based Maintenance
1230 – 1245	Break
1245 – 1420	Maintenance Protocols & Best Practices (cont'd) Importance of Regular System Checks & Documentation
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Three

Day 4

0730 – 0930	Case Study: A Real-World Incident Involving System Failure Analyzing What Went Wrong • Lessons Learned & Preventive Measures
0930 – 0945	Break
0945 – 1100	Safe Isolation & Inspection Participants Practice Safe Isolation Procedures • Hands-on Inspection of Safeguarding Vent & Relief Systems
1100 – 1230	Advanced Devices & Technologies Introduction to New & Emerging Technologies in the Field
1230 – 1245	Break
1245 – 1420	Advanced Devices & Technologies (cont'd) Benefits & Challenges Associated with their Adoption
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Four

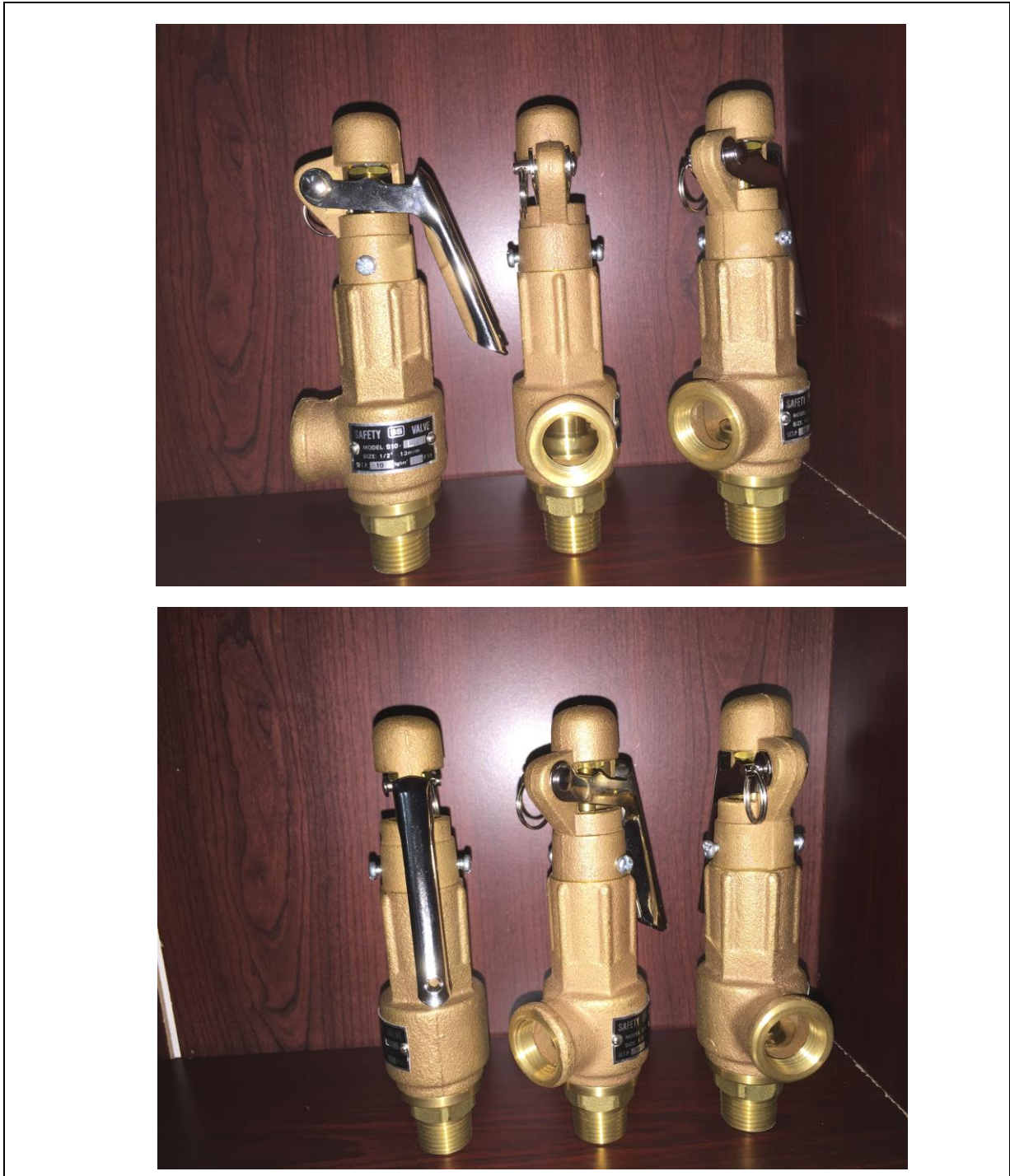
Day 5

0730 – 0930	Calibration & Testing of System Components Procedures & Importance of Regular Calibration • Hands-On Session on Calibration Tools & Techniques
0930 – 0945	Break
0945 – 1100	Safety Protocols & Emergency Responses Best Practices to Ensure Worker Safety • Emergency Procedures in Case of System Failures or Breaches
1100 – 1230	Documentation & Compliance Importance of Proper Record-Keeping
1230 – 1245	Break
1245 – 1345	Documentation & Compliance (cont'd) Meeting Industrial Compliance & Standards
1345 – 1400	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course



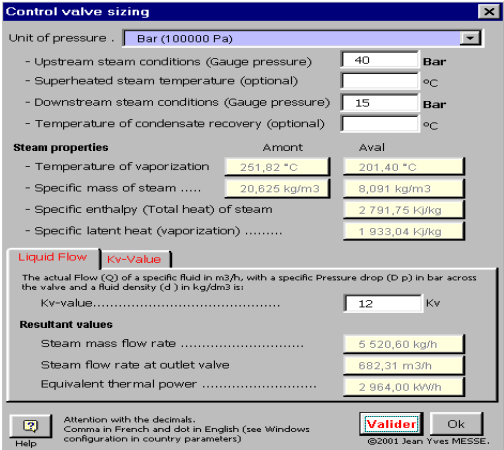
Valve Demo Kit

Practical session will be organized during the course for delegates to practice the theory learnt.



Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the state-of-the-art “Valve Sizing Software”, “Valve Software 3.0”, “Valvestar 7.2 Software” and “PRV2SIZE Software”.



Control valve sizing

Unit of pressure: Bar (100000 Pa)

Upstream steam conditions (Gauge pressure): 40 Bar

Superheated steam temperature (optional): °C

Downstream steam conditions (Gauge pressure): 15 Bar

Temperature of condensate recovery (optional): °C

Steam properties	Amount	Aval
Temperature of vaporization	251,82 °C	201,40 °C
Specific mass of steam	20,625 kg/m ³	8,091 kg/m ³
Specific enthalpy (Total heat) of steam	2 791,75 kJ/kg	
Specific latent heat (vaporization)	1 933,04 kJ/kg	

Liquid Flow: Kv-Value

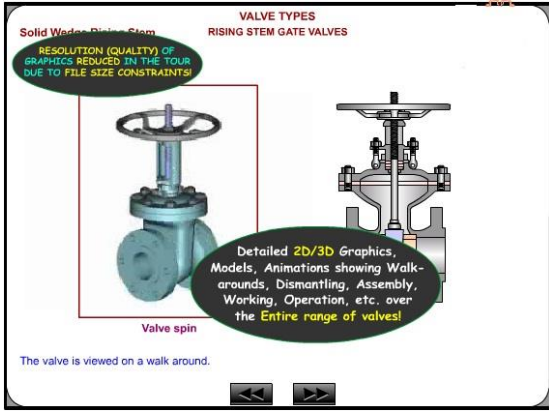
The actual Flow (Q) of a specific fluid in m³/h, with a specific Pressure drop (D p) in bar across the valve and a fluid density (d) in kg/dm³ is:

Kv-value: 12 Kv

Resultant values

Steam mass flow rate	5 520,60 kg/h
Steam flow rate at outlet valve	682,31 m ³ /h
Equivalent thermal power	2 964,00 kW/h

Valider OK



VALVE TYPES
RISING STEM GATE VALVES

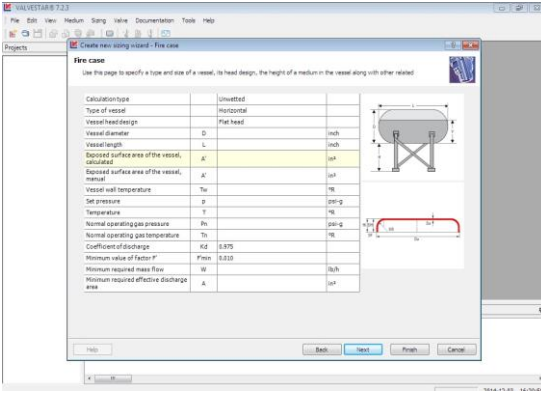
Solid Woder, Rising Stem

RESOLUTION (QUALITY) OF GRAPHICS REDUCED IN THE TOUR DUE TO FILE SIZE CONSTRAINTS

Valve spin

Detailed 2D/3D Graphics, Models, Animations showing Walk-arounds, Dismantling, Assembly, Working, Operation, etc. over the Entire range of valves!

The valve is viewed on a walk around.



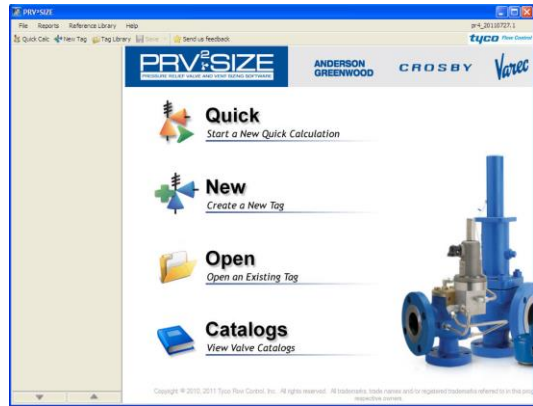
VALVESTAR 7.2.3

File Edit View Medium Spring Valve Documentation Tools Help

Create new spring vessel - Fire case

Use this page to specify a type and size of a vessel, its head design, the height of a medium in the vessel along with other related

Calculation type	Unsettled
Type of vessel	Horizontal
Vessel head design	Flat head
Vessel diameter	D
Vessel length	L
Exposed surface area of the vessel, calculated	A _e
Exposed surface area of the vessel, manual	A _e
Vessel wall temperature	T _w
Set pressure	P
Temperature	T
Normal operating gas pressure	P _n
Normal operating gas temperature	T _n
Coefficient of discharge	K _d 0,875
Minimum value of factor F	F _{min} 0,20
Minimum required mass flow	W
Minimum required effective discharge area	A



PRV2SIZE

Anderson Greenwood Crosby Valtec

Quick
Start a New Quick Calculation

New
Create a New Tag

Open
Open an Existing Tag

Catalogs
View Valve Catalogs

Course Coordinator

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