

Royce J. Laverman

Senior Consultant
Tank Industry Consultants



Education

PhD Level Studies
Illinois Institute of Technology

M.S. Illinois Institute
of Technology

B.S. Illinois Institute
of Technology

Professional Affiliations

American Society of Mechanical Engineers (ASME)

Cryogenic Society of America

American Petroleum Institute (API)

- Environmental Technical Advisory Committee
- Evaporation Loss Measurement Committee and Task Groups

American Gas Association (AGA)

- Subcommittee on Basic Research

National Fire Protection Association (NFPA)

- Committee 59A on Liquefied Natural Gas

Western Society of Engineers' Landmark Award

Royce J. Laverman, Senior Consultant, has nearly forty years experience with a major storage tank constructor specializing in design, engineering, fabrication, and field erection of bulk liquid terminals, low temperature and cryogenic liquefaction storage facilities, and other steel plate structures and their associated systems. He has extensive broad range experience in product development and innovation of mechanical equipment and process systems, covering concept through testing, manufacturing, and marketing. He developed an emergency vent system for floating-roof storage tanks to protect the roof from sinking when storing high-vapor pressure products or during gas injection operation. He reduced emissions of over 200 floating-roof tanks by more than 90% by equipping them with newly developed and patented mechanical-shoe primary seals, metallic secondary seals, and guide pole fittings. Among his key accomplishments, he has developed storage tank emission calculation methods and equipment loss factors that were adopted by the USEPA for use by the petroleum and petrochemical industries.

Mr. Laverman has prepared over eight new publications for API, critical in establishing Loss Factor Certification Program to promote significant petroleum industry storage tank emission reductions. He researched, wrote, and presented over twenty technical papers on thermodynamic properties of fluids and storage tank emissions at national and international conferences, and has written more than 300 technical documents.

He has been granted fourteen US patents.

Mr. Laverman was awarded a Lifetime Achievement Citation from the President of the American Petroleum Institute for leadership, technical excellence, and pioneering work in the field of storage tank emission measurement and control. API also awarded Mr. Laverman a Citation for Services for his work on the Committee on Petroleum Measurement. He was also awarded the Western Society of Engineers' Landmark Award in recognition of his technical and ethical insights and contributions; sharing of knowledge and promotion of engineering training; and participation in technical societies, publication and education.

Publications/Presentations

Mr. Laverman has authored a substantial number of technical papers and publications on subjects related to the design, construction, operation, maintenance, inspection, and repair of storage systems. A partial list of publications and presentations follows:

- ***Product Inventory Improvements for Floating-Roof Tanks***
Co-Authors: T.A. Gallagher and J. A. Benvegna
- ***Evaporative Loss From Floating-Roof Tanks***
Co-Authors: T.A. Gallagher and W.S. Schoerner
- ***Emission Control Options for Floating-Roof Tanks***
Co-Author: T.A. Gallagher
- ***Tanks and Emission Abatement: Where We Are Headed and How We Will Do It?***
Co-Authors: P.J. Winters and J.H. Ford
- ***Refinery and Marketing Terminal Storage Tank Emissions***
- ***Current Developments and Maintenance of Floating-Roof Tanks***
Co-authors: Kaups, T., Stefanson, T. M. and Tietz, H.J.
- ***Emission Reductions From Aboveground Storage Tanks***
Co-author: P.J. Winters
- ***Emission Reduction Options for Floating-Roof Tanks***
- ***Evaporative Loss From Storage Tanks***
- ***Evaporation Loss From External Floating-Roof Tanks***
- ***Results From an Advanced Power Plant Cooling Demonstration***
Co-Authors: J.T. Bartz, R.T. Allemann, and J.T. Van Laar
- ***Evaporation Loss Control Effectiveness for Storage Tanks***
- ***Evaporation Loss Measurement From Storage Tanks***
- ***Emission Measurements on a Floating Roof Pilot Test Tank***
- ***Phase Behavior of the Methane-Carbon Dioxide System in the Solid-Vapor Region***
Co-Author: G.M. Agrawal
- ***Analysis of Parallel Flow Multi-Stream Heat Exchangers***
Co-Authors: J.C. Chato and J.M. Shah
- ***Experimental and Calculated Specific Heats and Joule-Thomson Coefficients of Methane-Ethane Mixtures***
Co-Authors: K.A. Alkasab and R.A. Budenholzer
- ***Calculated and Measured Isothermal and Adiabatic Joule-Thomson Coefficients for Methane-Ethane Mixtures***
Co-Authors: K.A. Alkasab, J.M. Shah. and R.A. Budenholzer, R.A.
- ***Experimental Study of Vapor-Liquid Equilibrium in the Methane-Ethane-Propane System Between 50 °F and 100 °F***
Co-Authors: L. Djordjevich and A. Sponzilli
- ***Calorimeter Helps Design Better LNG Liquefaction Cycles for Natural Gas***
Co-Author: Y.A. Selcukoglu