INTERNATIONAL CONFERENCE

By Alexander Sazonov

Plastic Pipes XVII International Conference, one of the most important events of plastic pipes industry took place on 22–24 September 2014 in Chicago. The organisers were, traditionally, American Plastic Pipe Institute Inc., PVC4Pipes Association, PE100+ Association and TEPPFA, the European Plastic Pipes and Fittings Association.

462 participants from 32 countries took part in the Conference. The delegation from America was an impressive one composed of 228 members, the second largest delegation was from China (50 members), for the first time outnumbering delegations from Germany and The Netherlands.. Russia was represented by three participants and one member of Organising Committee. The Conference included 122 papers, 9 poster and 26 exhibition stands.

Stephen Boros, Chairman of Organising Committee, noted during opening of the conference that plastic pipeline industry was constantly developing and its rate for the next 10 years would maintain the same level, 10% more. Amongst major growth factors, he named the development of shale oil and gas production, growth of regional markets, innovations and achievements in evaluation of pipeline operation life. He also highlighted that plastic pipelines continued to displace the traditional materials, such as copper, steel, concrete and mentioned some new categories of projects like: “green the desert”, combating the post-effect of draughts, storm water disposal and others – the projects that became possible owing to development of polymeric technologies. According to some studies, trade turnover of polymer and related industries would reach 500 billion dollars by 2024.

The paper of TEPPFA European Plastic Pipes and Fittings Association and VITO Flemish Institute for Technological Research presented the latest results of large-scale research on integral environmental impact encountered during the life-span of particular plastic pipe system. The research included ecological impact evaluation of the pipelines for different purposes, made of different materials, at different stages of their lifecycle – production of the material, construction, operation and utilisation in comparison with pipelines made of traditional materials.

Peter Verlaan, representing Wavin and TEPPFA, told about the field experiment of construction of the sewage collector made of PVC and concrete pipes. Chronometry of installation of plastic and concrete sections confirmed that the use of plastic pipes significantly (30%) accelerated the construction process.

Presentations from Steve Sandstrum (ISCO Industries, Inc.) and Stephen Boros (Pipeline Plastics, LLC.) were dedicated to comparison analysis of the most commonly used pipe grades of PE designations – PE 100 of ISO and PE 4710 of ASTM. This topic was becomes very important due to the growing globalisation of plastic pipes market where large transnational project involve companies working according to different standards.

Later the conference continued in two sessions. Session 2A was devoted to a responsible approach to infrastructure.

Steven Folkman from Utah University told about results of lab tests on PVC pipes that were in use for 20–49 years. Those tests confirmed that life of PVS pipelines is not less than 100 years subject to observation of production and installation technologies.

John Kurdziel, Chief Engineer of Advanced Drainage Systems, told about required engineering properties for HDPE pipe utilizing recycled materials recycled materials

Kumhoong Lou from Borouge, presented the results of study on permissible amount of recycled material in PE pipes for drip irrigation used for "Green the Desert" project in Abu Dhabi.

Zoran Davidovski, Vice-President of Pipelife Group told about the VynylPlus 10-year programme and its goals.

Stephan Schuessler from Georg Fischer told about transparent PVC-U pipes designed by the company for photobioreactors for biomass growing present – a prospective raw material for a number of industries.

Andrew Wedgner (Borouge Pte Ltd.) showed how realization of even simple projects using modern PE pipe systems can improve the social environment in world's poorest countries.

Session 2B was devoted to joining methods and testing of plastic pipes.

Robert Eckert (FRIATEC AG – ALIAXIS Utilities & Industry) told about new effective ways of large PE pipes live branching.

Alex Geringer from Georg Fischer Piping Systems Ltd. told about new products – branch saddle system and electrofusion couplers with active reinforcement for large diameter PE mains.

Dominique Gueugnaut (GDF SUEZ) made a presentation prepared by the group of French specialists about ultrasonic phased array inspection of small diameter (63 mm) PE pipelines and fittings used for gas distribution.

Edward Ingham and Shepherd from Great Britain told about a developed national standard for training and certification of welders of PE pipes.

Pedrom Tayefi from Sheffield University told about analysis of the fatigue performance of contaminated electrofusion tapping tees and their link to installation failures.

Z. Jimmy Zhou (Dow Chemical Company) and Jim Johnston (McElroy Manufacturing Inc.) shared the results of a study on essential thermoplastic materials variables influencing the quality of welding.

Session 3A was dedicated to material properties impacting pipeline performance.

Stefan Dreckötter from Borealis told about the results of prolonged ISO 9080 hydrostatic testing and stress crack resistance of PEX-c pipes. In all cases the results were significantly above the existing requirements for the pipes.

Steven Horwatt from Equistar Chemicals presented a method of antioxidant content evaluation in PE using Rapid LC-MS technique, which is faster than standard OIT.

Representatives of Engineering Mechanics Corporation of Columbus and US Nuclear Regulatory Commission told about their study of critical flaw size in butt-fusion joints of HDPE pipes. This research was done in relation to development of amendments to Nuclear Power station inspection rules.

Chevron Phillips Chemical's presentation analysed internal tension in PE pipes when using dual cooling during extrusion and their effect on the rapid crack propagation performance of polyethylene.

Possibilities of using differential scanning calorimetry for exact evaluation of plastication of PVC pipes were reviewed in the paper of Engineering Systems Inc.

Dow Chemical paper was about effect of surface defects (scratches, etc.) on the long-term durability of PE pipes.

The subject of Session 3B was new plastic piping materials. The presentations were about PVC-O, PA-12, coloured master-batches and possibility of reducing costs of PVC pipelines.

During the second day of the conference the following topics were discussed: material testing advancements, trenchless technologies, joining and fitting solutions for polyolefin pipes; material performance in hot water applications.

Session 4A started with presentation from Korean specialist telling about the results of experiments on non-destructive evaluation of improper fusion for PE heat fusion socket joint using phase array ultrasonic imaging method.

Three papers from Advanced Drainage Systems were about creep rupture and creep modulus testing of HDPE and PP pipe grades.

Two papers from Kiwa Technology and Chevron Phillips Chemical were about the phenomenon of rapid crack propagation in HDPE and PP and factors causing it.

Session 4B covered trenchless pipelines construction and renovation technologies, evaluation of the long-term

Stephen Boros

Zoran Davidovski

performance of composite plastic liners, examples of effective implementation of trenchless technologies, including PVC pipes welding. The paper of Australian participants drew special interest – it was about the plough-in of a large diameter PE pipe installation – up to DN 630 and twin strands of 315 mm.

All papers in Session 5A "Polyolefin Pipe, Joining and Fitting Solutions" were about large diameter PE pipes. This session was opened by a representative of Qenos (Australia), who told about a unique rapid construction of 4-km 1600 mm pipeline for river (which destroyed the dam). Successful implementation of this product have prevented energy crisis of the whole state.

Roger Jepson from Union Pipes Industry spoke about the rapid spread of large diameter PE pipes in the Middle East and Asia.

Derek Muckle from Radius Systems gave an overview of installation of large diameter close fit PE liner.

Bernd Klemm (WIDOS) summarised experience and recommendations for joints welding of large diameter PE pipes.

Steve Sandrum (ISCO Industries, Inc.) together with his colleagues from Reinert-Ritz GmbH analysed the "weakest links" of large diameter PE pipelines and solutions for their elimination.

Presentations made at Session 5B were all about PE material performance in hot water applications. Japanese specialists presented two papers: one was about ageing and deterioration processes of PE-RT pipes and recommendations for measures against deterioration; the other one presented results of the long-term tests on PEX and PE-RT pipes used for hot water applications.

Three papers from Borealis, Borouge and Basell were about properties of new generation PP-RCT, multi-modal PP-R and PP125.

Session 6A focused on accelerated testing and service life assessment.

Scientists from Leoben (Austria) presented papers about PP multi-layer pipe lifetime assessment and correlation of results of the accelerated tests on samples of PE pipes of different shape with the ISO 9080 standard tests.

Specialist from Osaka Gas Co., Ltd. и Kyoto Institute of Technology presented a new method of the ring creep test for multi-layer composite pipes.

Karin Jacobson from Swerea KIMAB told about the mechanism of ageing of polyolefin pipes (PE and PP) in contact with chlorine dioxide and about comparison of the results of accelerated tests on PP pipes samples after operation.

Professor Vanspeybroeck (Becetel) told about PE pipes accelerated notch test (PANT-method) and its advantages compared to the standard method of notch tests according to ISO 13479.

The subject of session 6B was "Plastic Pipe Use and the Environment". The presented papers touched upon general subjects related to deployment and use of plastic pipes: the role of standardisation, training programmes, expanding of application, etc.

Session 7A was devoted to structure wall pipes. The papers were about the matters related to testing the pipe and manholes, corrugated PP pipes production technologies, evaluation of performance of corrugated pipes under high outer load and the content of recycled materials in them. Borealis focused on material properties for stormwater boxes – a new niche for storm water management.

Session 7B was opened with a presentation by Udo Anders (Baerlocher GmbH) on PVC stabilisers for pipes in different countries. A joint paper of Mexican and Columbian Dow and Universidad de los Andes in Columbia described experiments on HDPE to increase their abrasion resistance by cross-linking (adding peroxide masterbatches). Representatives from Swerea KIMAB gave an overview of plastic pipes used in steel pickling industry. Mexican specialist presented a mathematical model of gasket behaviour in the bell-and-spigot joint. Frans Scholten (Kiwa Technology) told about possibilities of an assessment method of electrofusion joints in PE pipes using energy-to-failure analysis and gave recommendations for effectiveness of the joints.

Session 8A was devoted to gas pipeline performance. Three papers were presented by Gas Technology Institute. The authors of one of the papers suggested a new technology for PE gas pipelines renovation using 2-component acrylic adhesive and PE patches, and announced test results confirming its reliability. The second paper was about two-year study of the impact of heavy hydrocarbon on PE pipelines. The third paper from Gas Technology Institute

was dedicated to remaining life expectancy and risk profile of vintage Ardyl A gas pipelines which were in operation during the period of 1972 1974. Other papers were also about life expectancy of PE pipelines, data on tests results with regard to PE pipe after 30 years of operation, performance evaluation methodology of pipe and electrofusion joints, (the paper from Institute of Polymeric Materials and Testing/ IKU) performance of PE 100 and PEX pipes in contact with liquid hydrocarbons.

Session 8B was all about application of PE pipes in industrial networks with severe operation conditions (temperature, pressure, chemical composition) in comparison with application connected with transportation of water and gas. The papers were focused on abrasion resistance of PE during pulp transportation, possibilities of implementation of PE-RT pipes in oil and gas and heating supply networks, as well as methods of PE liners connection in steel pipes renovation.

Session 9A was devoted to plastic pipes advancements.

Frank O'Callaghan from Iplex Pipelines (New Zealand) presented a detailed analysis of performance of pipelines made of different materials and destroyed as a result of earthquakes in New Zealand from 1987 to 2014 and gave recommendation on design of pipeline systems in seismic regions considering the complexity and costs of their restoration after the event.

Steve Sandrum and his colleagues (ISCO Industries) told about choosing pipe for 38 km pipelines project in San Antonio, Texas. It is not the most impressive project according to the Russian standards (diameter from 18" to 36" – 450 mm to 900 mm) but it was named one of the projects of the year by Plastics Pipe Institute.

Dug Sergeant (EPCOR Water Services Inc.) described development of water supply in Edmonton, Canada using PVC pipes. Chinese specialists told about their experience in underwater installation of steel wire reinforced PE composite pipelines across sea channels between the islands.

Specialist from Japan Polyethylene Corporation (Kawasaki, Japan) told about new grade of PE 100 – NOVATECTM HD HE222W combining easy processing (flow melt index at high load – 18 gr/10 min) and strength properties that are higher than required by the Association of PE100+.

Session 9B focused on lifetime of the pipelines and conditions for maintaining them.

A representative of Swerea KIMAB and Scandinavian Organisation of water users (4S-ledningsnät) presented results of studies determining whether 150-year PE water pipeline lifetime is achievable, what technical and organisational measures must be taken to achieve it.

Specialist from Jana Laboratories told about theoretical grounds for PE pipes use for potable water supply, operation assessment and residual resources.

Riccardo Barbone's (Georg Fischer Piping Systems) paper was dedicated to the history of pipeline systems. The analysis of driving forces and their evolution can help to determine further development of the industry.

Steve Sandstrum

Austrian specialists told about the results of small diameter PE pipes (50 mm) testing that have been in operation for decades (from 24 to 55 years) in water supply networks in Vienna and Graz. The results showed that the residual lifetime was still high and the operating lifetime would surpass the standard 50 years.

A joint paper of TEPPFA, Wavin, Borealis and Lyondell-Basell was about prediction of residual lifetime of gravity PE. The study show that their lifetime would be not less than 100 years subject to observance of all requirements.

Session 10A was about pipeline management. Two papers were about the Distribution Integrity Management Program of the US Department of Transport: Demmis Jarnecke from Technology Institute told about development of unified automatic system for data collection and processing of welding parameters. Randall Knapp from Plastics Pipe Institute told about problems of tracking and traceability in plastic gas distribution systems.

Two papers on pipeline assets management were presented by Jana representatives: they were about implementation of mechanical probability models for prioritising Aldyl gas pipeline replacement that has been in operation since 1960s and a new asset management JANAcquire55™ approach developed by the company.

Chinese specialists gave an overview of current condition of municipal water supply networks in China and the role of plastic pipes in their development.

Session 10B was devoted to problems related to slow crack growth testing in PE pipes. The conference participants presented test methods for PE100 RC pipes. British

Exova informed about the development of a slow crack growth resistance (Strain Hardening) test for assessment of ageing PE pipeline material. Despite the advantages this method did not show the reliable result.

Twelve briefs on different subjects were presented at the end of the conference: about development of new grades of PE pipe materials, design of pipes and fittings, examples of plastic pipes applications. There were posters were located in the conference hall.

The next Plastic Pipes Conference will be hosted in Berlin 12–14 September 2016. Zoran Davidovski, Marketing and Innovations Vice-President of Pipelife Group was nominated the Chairman of Organising Committee. It was also announced that intermediate Asian Conference will take place in Shanghai on 21–22 September 2015.

Notes:

Plastic Pipes Journal editorial staff would like to inform you that The International Pipes Conference has opened an online database containing all its papers since its first convention in 1970 in Southampton (UK) until their most recent event in Barcelona in 2012. The Online database is available on www.plasticpipesconference.com. If you are interested in obtaining conference papers from Plastic Pipes XVII, please contact Conference organisers at: ppxvii@congress.hu, tel. +36-1-212-0056, Mrs Eva Balassa.

Rob Spekreijse