Ensuring the highest quality in PE 100 pressure piping materials: The PE100+ Association

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Introduction

• PE is a well-established pipe material in gas and water transport
• Today, PE 100 is the standard material for highly demanding applications
• The plastics industry in PE and PE 100 could largely benefit from a common market place, i.e. an Association of producers with common marketing and quality objectives
Objectives of the PE100+ Association

Created on the 24th of February, 1999

“The objective of the Association is to establish a quality label for PE100+ products and to promote the use and the safety of PE 100 products generally and of PE100+ products in particular.

In addition, the Association will engage in appropriate public relations activities, present itself as an industry group and increase its influence both within and outside of Europe”
How is the Association organised?

• Association members, i.e. raw material producers, meet once a year in a member meeting and elect a board, responsible for day-to-day work in the Association

• A technical committee supports the Association where testing is concerned

• Guidance is sought from the market through the Advisory Committee
 Ahead of standardisation

• On a technical level, the Association has the objective to be at the forefront
• On ISO level, norms exist for water and gas pipes in PE. On CEN level, they hopefully exist in near future
• The Association therefore wants
  – to set requirements for good PE 100 materials
  – to install a neutral quality control scheme
Technical requirements

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>EN/ISO Standard requirement</th>
<th>PE 100+ requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creep Rupture Strength</td>
<td>Internal pressure test at 20°C and 12.4 MPa ISO 1167</td>
<td>&gt; 100 h</td>
<td>&gt; 200 h</td>
</tr>
<tr>
<td>Stress Crack Resistance</td>
<td>Pipe notch test at 80°C and 9.2 bar ISO 13479</td>
<td>&gt; 165 h</td>
<td>&gt; 500 h</td>
</tr>
<tr>
<td>Resistance to Rapid Crack Propagation</td>
<td>S4 test at 0°C ISO 13477</td>
<td>Pc &gt; MOP/2,4 – 13/18</td>
<td>Pc: critical pressure MOP: max. operat. pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt; 10 bar</td>
</tr>
</tbody>
</table>

All tests are performed on 110 mm SDR 11 pipes
Test rounds

Every 7 months
15 pipes

Each 5 pipes

PE 100 manufacturer

Administrator GASTEC

SKZ Internal pressure test

Becetel S4 test

Results

Bodycote (Studsvik) Notch Test

Administrator GASTEC

Positive List PE100+ Association

don't crack under pressure

PE100+Association/A.Scheelen

9/2001

7
Positive list of materials

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finathene® XS10 H (blue)</td>
<td>ATOFINA</td>
</tr>
<tr>
<td>Finathene® XS10 B (black)</td>
<td>ATOFINA</td>
</tr>
<tr>
<td>Hostalen® CRP 100 black</td>
<td>Basell Polyolefine GmbH</td>
</tr>
<tr>
<td>Hostalen® CRP 100 blue</td>
<td>Basell Polyolefine GmbH</td>
</tr>
<tr>
<td>Hostalen® CRP 100 orange/yellow</td>
<td>Basell Polyolefine GmbH</td>
</tr>
<tr>
<td>Borstar® HE3490-LS (black)</td>
<td>Borealis AB</td>
</tr>
<tr>
<td>Vestolen® A 6060 R (black)</td>
<td>DSM Polyolefine GmbH</td>
</tr>
<tr>
<td>Eltex® TUB 121 (black)</td>
<td>Solvay Polyolefins Europe</td>
</tr>
<tr>
<td>Eltex® TUB 125 N2025 (orange)</td>
<td>Solvay Polyolefins Europe</td>
</tr>
<tr>
<td>Eltex® TUB 124 N2025 (blue)</td>
<td>Solvay Polyolefins Europe</td>
</tr>
</tbody>
</table>

List valid until October 2001

As a result of the testing rounds, this positive list is regularly updated
Not only organising tests

• The objective of the Association goes far beyond quality insurance and testing
• Marketing issues are dealt with from a common market place
  – PE100 website
  – Seminar rounds
• The Advisory Committee provides feedback from the market
www.pe100plus.net - facelift NOW

The internet site is one tool to re-position the PE100+ Association as the marketing platform for PE piping in general by:

• Regular News
• Comprehensive download centre
• Q&A section
• Web link centre
www.pe100plus.net - facelift NOW

Welcome

The PE100+ Association

Founded on Feb. 24, 1999, the PE100+ Association is an industry organization of several polyethylene (PE) manufacturers whose objective is to guarantee consistent quality at the highest level in the production and the use of PE100 pipe material.

By monitoring the most critical properties of enhanced requirements, we are able to issue a "PE100+ Association Positive List of Materials" on a regular basis.

We also aim to create a marketing platform to promote the use of PE piping in general.
Seminar rounds

• The target of those seminars is:
  - to show the outstanding performance of the piping material Polyethylene 100 (PE 100)
  - to ensure all the participants about the safety transport possibilities of drinking water, natural gas and industrial fluids using pipelines made of PE

• Speakers from the industry provide background information by using case stories to demonstrate the successful use of PE 100 piping materials

• These seminar rounds are performed locally, by adopting the country requirements and using the local language
Recently: Spain

• “PE100+: De tour por Espana” Together with AseTUB, the association of Spanish pipe & fitting producers, the PE100+ Association organised a seminar cycle in four locations.
## Previous and forthcoming seminars

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997 - 2000</td>
<td>Germany*)</td>
<td>(*) Seminars were organised by International Ingenieurberatung GmbH, Dipl. Ing. Heiner Brömstrup, Wiesbaden</td>
</tr>
<tr>
<td></td>
<td>Switzerland*)</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Poland</td>
<td></td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>Paris, Lyon, Nantes</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>about 190 participants</td>
</tr>
<tr>
<td>2001</td>
<td>Spain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seville, Madrid, Bilbao, Barcelona</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spain</td>
<td>about 200 participants</td>
</tr>
<tr>
<td>2001</td>
<td>Italy**)</td>
<td>**) performed later this year</td>
</tr>
<tr>
<td>next</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
<td></td>
</tr>
</tbody>
</table>

**) performed later this year
Advisory Committee

• The Advisory Committee will consist of individuals not affiliated with any Member who will be experts in the field of pressure pipes and fittings for use in gas and water supply systems, sewage disposal and industrial and mining applications.

• The Advisory Committee shall provide non-binding advice to the Association on matters relating to the use and marketing of PE100+ products.
Advisory committee meetings

• **Toulouse 1998**: informal feedback from the market about the idea of the Association

• **Madrid 1999**: European market survey, combined with a workshop on the goals of the Association

• **Brussels 2000**: content and layout of our marketing tools

• **Napoli 2001**: “optimisation of the co-operation in the chain”
Napoli meeting of the advisory committee

• Several partners made presentations how to guarantee the value throughout the chain.

• Points of view from very different sources led to a common approach
PE100+ role in the quality chain

- **who**
  - Resin manufacturer
  - Pipe/Fitting producer
  - Test Institutes
  - Gas & Water companies
  - Contractors

- **quality**
  - resin
  - processing
  - design - resin processing
  - design
  - construction

- **norms**
  - pr12201/1555 “national”
  - pr12201/1555 “national”
  - pr12201/1555 “national”
  - pr12201/1555 company stdts tenders
  - en12007 company stdts code of practise

- **competences**
  - resin
  - tech. file
  - asses. conf.
  - traceability
  - processing
  - approval file
  - asses. conf.
  - traceability
  - Indepth testing
  - qualification
  - fitness for purpose
  - design
  - material choice
  - quality >> cost
  - contractors
  - installation
  - welding

- **PE 100+**
  - requirements
  - frequency
  - requirements
  - frequency advisory
  - indepth testing advisory
  - advisory road shows
  - advisory road shows

**d o n ' t c r a c k u n d e r p r e s s u r e**
Conclusions

• In the past, the PE100+ Association focused on testing and quality control

• Marketing issues are at least as important

• Together with the Advisory committee, the PE100+ Association will construct a model showing both performance and advantages of PE pipe systems all over the chain