AZALT ECO²
Simply reduces working temperatures

AZALT ECO² is a « Ready to Use » bitumen which allows to reduce up to 40°C the temperature of manufacturing and application of the asphalt mixes without any investment of the mixing plant. This innovative product is available from 2 TOTAL French refineries.

Azalt ECO²: Many benefits

• "Ready to Use" bitumen
• Reduction of production and application temperature of asphalt mixes up to 40°C
• Energy savings at the mixing plant
• Improvement of the environmental footprint
• Possible use both for base course and wearing course
• Compatible technique with the incorporation of RAP (Reclaimed Asphalt Pavement)
• Faster application in the case of 2 layers the same day
• Improvement of the comfort of the application team
• Mechanical performances of the mixes with Azalt ECO² similar to those of a classical hot mix

Improvement of the environmental footprint at the mixing plant

Energy consumption

Global warming emission

Reduction of the consumption up to 35%
At the mixing plant, reduction of global warming emissions up to 30%
In across 20 plants worldwide, Styrelf® is produced by crosslinking of thermoplastic elastomers within bitumen. The high level of performances of Styrelf® is the result of an innovative process, involving "in situ" generation of a continuous polymer network throughout the bitumen. This flexible network is formed by an irreversible chemical reaction and provides Styrelf® with a very fine, homogeneous microstructure that allows achieving outstanding properties:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>No phase separation</td>
<td>Perfect storage stability</td>
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<tr>
<td>High ageing resistance</td>
<td>Increased durability</td>
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<tr>
<td>High elongation capacity and elastic recovery</td>
<td>High resistance to fatigue and rutting</td>
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<tr>
<td>Low temperature susceptibility</td>
<td>High rutting and cracking resistance</td>
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<tr>
<td>Strong cohesion and adhesiveness</td>
<td>High fretting and shearing resistance</td>
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The benefits from Styrelf® binder properties find an expression into the asphalt aggregate mix performances: good resistance to rutting, to ravelling, to fatigue result in an excellent durability, leading in a spacing out of maintenances.

It appears that, even if the initial cost of the road is slightly higher, as compared to a road made with conventional binders, the use of Styrelf becomes cost effective after 5 to 6 years and on.

Kromatis®

Put colour in your environment

Kromatis is TOTAL's clear binder range used to produce coloured asphalts available for use in hot mix applications as well as emulsion and can be used on highways, pedestrian walk ways, playgrounds, car parks, sports areas.

The use of Kromatis®

reduces lighting costs, lowers energy consumption, improves hazard perception and provides overall aesthetic enhancement.

Total's Kromatis® enables a broad pallet of colours for asphalt applications including:
- Tunnels
- Traffic calming areas
- Car Parks
- Bus Lanes - Cycle Paths - Leisure areas
List of articles presented during the Congress with the collaboration of TOTAL

- Life Cycle Inventory: BITUMEN (Session 4 - ref. 405)
  T. Blomberg (Nynas), F. Bernard (Total), M. Southern (Eurobitume)
  Oral presentation

- Warm mix asphalt made with a ready to use bitumen: an experimental field trial (Session 6 - ref. 406)
  L. Lapalu (Total), C. Juery (Total), A. Jullien (IFSTTAR), P. Tamagny (IFSTTAR)
  Oral presentation

- Development of a ready to use low temperature binder at the industrial scale (Session 6 - ref. 346)
  I. Perez Barreno (PROAS), A. Garcia Siller (PROAS), L. Lapalu (Total), C. Ruot (Total)

- Fatigue life of bitumen and mastics: analysis and comparison of different criteria (Session 7 - ref. 131)
  M. Buannie (Total and Département Génie Civil & Bâtiment, CNRS), J. Van Rompu (Total France and ENTP),
  H. Di Benedetto (Département Génie Civil & Bâtiment, CNRS), C. Ruot (Total), T. Gallet, (Total)

- Measuring the rheological properties of bituminous binders, Final results from the Round Robin Test
  of the BNP6/P04/GE1 working group (France) (Session 7 - ref. 157)
  B. Eckmann/S. Largeaud (EUROVIAS), D. Chabert (EFFAGE), G. Durand/M. Robert (COLAS), R. Van Rooijen (BP),
  E. Chailleux (IFFTAR), V. Mouillet (IFFTAR), H. Soenen (Nynas AB), N. Clavel (SHELL Bitumen), L. Lapalu (Total)

- Durability study: field experience of long-term evolution of SBS polymer modified binder (Session 7 - ref. 308)
  S. Dressen (Total), T. Gallet (Total), A-G. Dumont (University of Switzerland), M. Pittet (University of Switzerland)

- Interpreting a three-point bending test on pre-notched bitumen beam to determine cracking behavior at low temperature (Session 7 - ref. 319)
  E. Chailleux (IFFTAR), M. Le Guem (IFFTAR), F. Farcas (IFFTAR), S. Dreessen (Total)

- MSCRT: Performance related test method for rutting prediction of asphalt mixtures from binder rheological characteristics (Session 7 - ref. 311)
  S. Dreessen (Total), T. Gallet (Total)

- Round robin test of the fracture toughness test for the low temperature properties of bituminous binders (Session 7 - ref. 368)
  E. Chailleux (IFFTAR), E. Scholten (Kraton Polymers), T. Blomberg (Nynas), M. Hugener (EMPA), T. Gallet (Total),
  S. Büchler (University of Braunschweig), I. M. Lancaster (Nynas), A. Jones (Petroplus), V. Mouillet (IFFTAR)

- Supramolecular additives for bitumen modification (Session 7 - ref. 413)
  L. Bouteiller (UPMC Univ Paris 6), L. Lapalu (Total), D. Basset (Total)