SELENIZZA®
NATURAL BITUMEN

NATURAL BITUMEN FOR HIGH-PERFORMANCE ASPHALT

Stronger roads. Thinner layers. Lower carbon.

A 99 %-pure natural bitumen that hardens any road binder, for less than SBS and with a fraction of the carbon.

Patrick PASCAL



THE CHALLENGE

Heavy traffic and heat push conventional binders past their limits

01

Rutting

Slow, heavy and braking loads make hot asphalt creep: bus stops, roundabouts, ports, airports.

02

Hard bitumen is scarce

Many regions and crude oils cannot supply hard grades, and refined hard bitumen cracks in the cold.

03

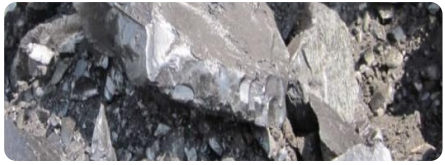
Polymers are costly

SBS modification works, but SBS costs more than twice as much as Selenizza.

Needed: a harder, longer-lasting binder without the polymer price tag.

THE SOLUTION

Selenizza Col®: a natural bitumen that hardens any road binder





Raw ore and calibrated granules, from Selenica (Albania).

99 %

Natural purity

No heating, no refining: the ore is simply crushed, calibrated and bagged.

100 %

Compatible

Blends with all road bitumens, with or without RAP.

< 1 %

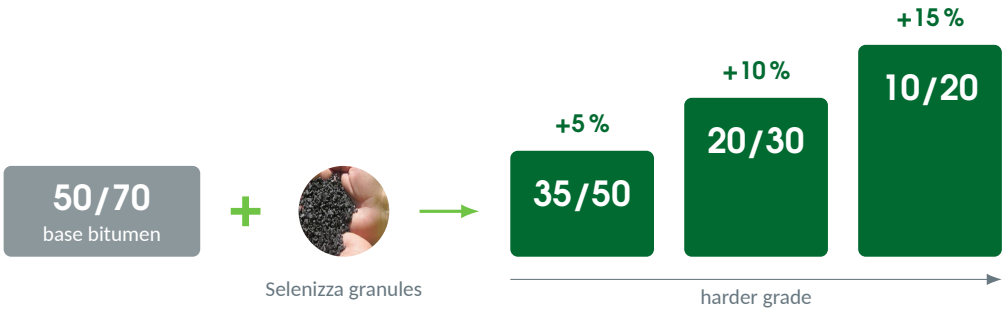
Of the asphalt mix

Typically 5 % of the binder, i.e. 0.20 to 0.45 % of the total mix (binder content 5.8 to 6 %).

SELENIZZA® NATURAL BITUMEN

HOW IT WORKS

One base bitumen, any harder grade: just adjust the dose



Also a lower-cost extender for SBS polymers: the same target grade, for less.

AT A GLANCE

The performance case in five numbers

×10	projected pavement life against rutting
+15–25 %	projected pavement life against fatigue
–20 %	base and binder course thickness, same performance
–12.8 %	material cost vs. an SBS-modified mix
24.6	kg CO_2e per tonne, vs. 500+ for petroleum bitumen

PROOF · RUTTING & FATIGUE

Ten times the projected life against rutting, longer against fatigue

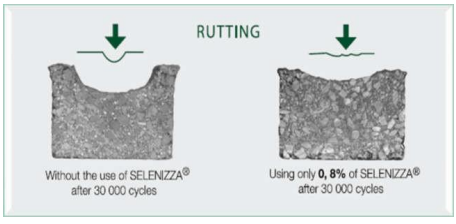
×10

projected pavement life against rutting

+15–25 %

projected pavement life against fatigue

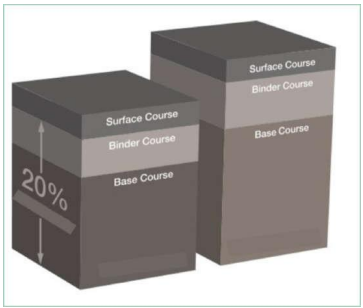
Higher binder viscosity: the mix resists creep under heat and slow, heavy loads.



Wheel-tracking test after 30 000 cycles: without Selenizza (left), with only 0.8 % in the mix (right). Selenizza test programme on high-modulus asphalt.

PROOF · STRUCTURAL DESIGN

Same performance with base and binder courses up to 20 % thinner



17–20 %

thinner base and binder courses, thanks to the high modulus of Selenizza-modified binders

Less material

Fewer tonnes of aggregate and binder to produce, haul and lay.

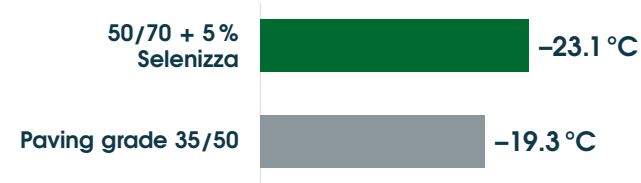
Lower lifetime cost

A longer useful life means fewer maintenance interventions.

Harder, yet not more brittle in the cold

Binder glass transition T_g (DSC), same 35/50 grade

Colder is better: more resistant to brittle cracking.



Asphalt mix cracking temperature (TSRST)

–33.2 °C

AC 16 binder course, 50/70 + 10 % Selenizza

–31.1 °C

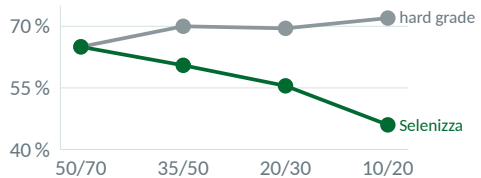
AC 22 base course, 50/70 + 20 % Selenizza

DSC: differential scanning calorimetry. TSRST: Thermal Stress Restrained Specimen Test (laboratory).

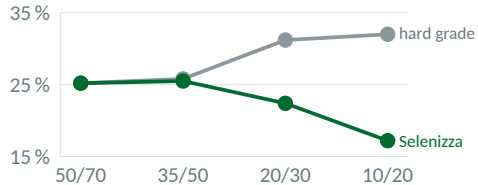
Selenizza-hardened binders age less than equivalent hard grades

Change in properties after RTFOT + PAV ageing (lower = less ageing): **50/70 + 5, 10, 15 % Selenizza** vs. **straight-run hard grades** of the same class.

Change in penetration



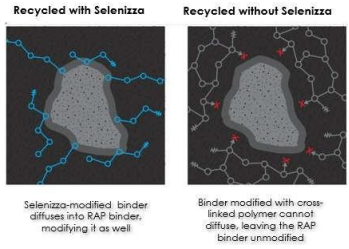
Change in softening point (R&B)



The more Selenizza is added, the more ageing is attenuated: it acts as an ageing inhibitor. RTFOT: short-term (manufacturing) ageing. PAV: long-term (service) ageing.

PROOF · CIRCULARITY

Brings recycled asphalt back to new-binder performance



With Selenizza: the old binder is revived

It diffuses into the aged RAP binder, making recycled bitumen as strong and durable as new.

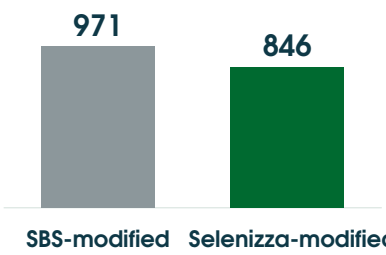
With SBS: the old binder stays apart

Cross-linked polymers form a matrix the RAP binder cannot bond with: the pavement is left vulnerable.

VALUE · COST

12.8 % lower material cost than an SBS-modified mix, with improved quality

Wearing-course material cost (k€)



–124.7 k€

Case: 10 km road, 21 m wide

Wearing course	AC-13, 4 cm
Asphalt mix	19 740 t
Unit price, SBS	341 CNY/t
Unit price, Selenizza	297.2 CNY/t
Saving	**864 612 CNY**

Source: South China University of Technology, Albanian natural asphalt vs. SBS-modified mixes. 2022 prices, to be updated for 2026. Euro values at the study's conversion rate.

VALUE · ENVIRONMENT

A fraction of the carbon footprint of petroleum bitumen

Global warming potential, kg CO_2e per tonne (GWP-100)

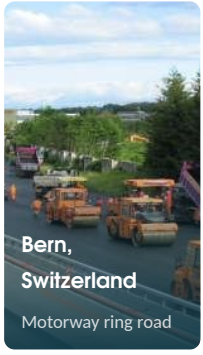


No heating | No refining | ≈ 99 % natural purity | EPD · LCA · SDS available

Petroleum bitumen: reported values can exceed 500 kg CO_2e/t depending on product and system boundaries. Selenizza Col®: 24.6 kg CO_2e/t (LCA, see appendix). Documents at www.selenizza.com.

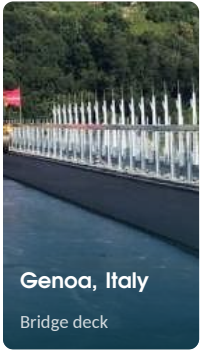
REFERENCES

Proven where pavements are pushed hardest



Bern, Switzerland

Motorway ring road



Genoa, Italy

Bridge deck



Le Havre, France

Container port



Kyiv, Ukraine

Stadium esplanade



Kourou, French Guiana

Ariane 6 launch-site runway, with Eiffage

Motorways, bridges, ports and aerospace: heavy, slow or static loads, under strong temperature swings.

CLIENTS

Chosen by leading contractors in more than ten countries

FRANCE

Eiffage
Colas
Siorat / NGE
Spie Batignolles Malet
Bonnefoy TP
Roger Martin SA
Toffolutti SA

SWITZERLAND

Weibel AG
Comibit SA
Walo Bertschinger AG
Grisard Bitumen AG

GREECE

Aktor SA
Terna SA

ITALY

Todini & Salini Impregilo
New Asphalt Srl
Iterchimica Srl

CZECH REPUBLIC

CIUR a.s.

UKRAINE

Avtodor

ASIA

Tianjin Port Free Trade Zone (CN)
BMT Group (VN)
A-One Road Co. Ltd (KR)

AFRICA

Afric Asphalte – S.S.M.T. (MA)
Andrade Gutierrez / Zagope (CM)

SELENIZZA®
NATURAL BITUMEN

NEXT STEP

Let's test Selenizza on your next mix design.

Share your base bitumen, target grade and traffic class: we will propose a dosage for a laboratory trial.

Patrick PASCAL

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One material, three markets

≈ 80 %

Asphalt mixes & mastic asphalt

Reinforcing agent dosed below 1 % of the mix for resistance to rutting and fatigue.

Oil

Oil & gas wells

Additive for high-temperature drilling fluids, shale stabilisation and well-cementing admixtures.

Build

Waterproofing & coatings

Protection of bridges, tunnels and viaducts; bituminous coatings for driveways, car parks, industrial floors and roofs.

Life-cycle assessment: potential impact per tonne of Selenizza Col®

IMPACT CATEGORY	PER METRIC TONNE
Global warming potential (GWP-100)	**24.6222 kg CO_2e**
Ozone depletion potential (ODP)	0
Eutrophication potential (EP)	41.00 eq PO_4/g
Acidification potential (AP)	0.0067 g eq H^+/g
Photochemical ozone creation potential (POCP)	0.2610 kg O_3 eq

Environmental Product Declaration (EPD), Life Cycle Assessment (LCA) and Safety Data Sheet (SDS) available at www.selenizza.com.