Neues aus der Bitumenindustrie

Dr. Martin Vondenhof

Definitions & cautionary note

Cautionary Note
The companies in which Shell plc directly and indirectly owns investments are separate legal entities. In this presentation "Shell", "Shell Group" and "Group" are sometimes used for convenience where references are made to Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to Shell plc and its subsidiaries in general or to those who work for them. These terms are also used where no useful purpose is served by identifying the particular entity or entities. ''Subsidiaries'', "Shell subsidiaries" and "Shell companies" as used in this presentation refer to entities over which Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations", respectively. "Joint ventures" and "joint operations" are collectively referred to as "joint arrangements". Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in an entity or unincorporated joint arrangement, after exclusion of all third-party interest.

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This presentation contains forward-looking statements (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "aim", "ambition", ''anticipate'', ''believe'', ''could'', ''estimate'', ''expect'', ''goals'', ''intend'', ''may'', "milestones", ''objectives'', ''outlook'', ''plan'', ''probably'', ''project'', ''risks'', "schedule", ''seek'', ''should'', ''target'', ''will'' and similar terms and phrases. There are a number of factors that could affect the future operations of Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this presentation, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, judicial, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; (m) risks associated with the impact of pandemics, such as the COVID-19 (coronavirus) outbreak; and (n) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this presentation are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Shell plc's Form 20-F for the year ended December 31, 2021 (available at www.shell.com/investor and www.sec.gov). These risk factors also expressly qualify all forward-looking statements contained in this presentation and should be considered by the reader. Each forward-looking statement speaks only as of the date of this presentation, March 14, 2023. Neither Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this presentation.

Shell's net carbon footprint
Also, in this presentation we may refer to Shell's "Net Carbon Footprint" or "Net Carbon Intensity", which include Shell's carbon emissions from the production of our energy products, our suppliers' carbon emissions in supplying energy for that production and our customers' carbon emissions associated with their use of the energy products we sell. Shell only controls its own emissions. The use of the term Shell's "Net Carbon Footprint" or "Net Carbon Intensity" are for convenience only and not intended to suggest these emissions are those of Shell plc or its subsidiaries.

Shell's net-Zero Emissions Target
Shell's operating plan, outlook and budgets are forecasted for a ten-year period and are updated every year. They reflect the current economic environment and what we can reasonably expect to see over the next ten years. Accordingly, they reflect our Scope 1, Scope 2 and Net Carbon Footprint (NCF) targets over the next ten years. However, Shell's operating plans cannot reflect our 2050 net-zero emissions target and 2035 NCF target, as these targets are currently outside our planning period. In the future, as society moves towards net-zero emissions, we expect Shell's operating plans to reflect this movement. However, if society is not net zero in 2050, as of today, there would be significant risk that Shell may not meet this target.

Forward Looking Non-GAAP measures
This presentation may contain certain forward-looking non-GAAP measures such as [cash capital expenditure] and [divestments]. We are unable to provide a reconciliation of these forward-looking Non-GAAP measures to the most comparable GAAP financial measures because certain information needed to reconcile those Non-GAAP measures to the most comparable GAAP financial measures is dependent on future events some of which are outside the control of Shell, such as oil and gas prices, interest rates and exchange rates. Moreover, estimating such GAAP measures with the required precision necessary to provide a meaningful reconciliation is extremely difficult and could not be accomplished without unreasonable effort. Non-GAAP measures in respect of future periods which cannot be reconciled to the most comparable GAAP financial measure are calculated in a manner which is consistent with the accounting policies applied in Shell plc's consolidated financial statements.

The contents of websites referred to in this presentation do not form part of this presentation.

We may have used certain terms, such as resources, in this presentation that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website www.sec.gov.

Aktuelle Themen der Asphaltindustrie

Betriebslizenz

Gesundheit / Arbeitsschutz

- Definitionen: was ist Bitumen, was ist Asphalt?
- Anforderungen an die Kreislaufwirtschaft
- Technische Regeln für Gefahrstoffe (1,5 mg/m³)
- …

Wettbewerbsfähigkeit

Bau von Verkehrsflächen

- Gebrauchseigenschaften von Asphalt (Performance)
- Nachhaltigkeit: Wiederverwendung von Asphalt
- Nachhaltigkeit: CO_2 - Fußabdruck
- Umweltproduktdeklaration (EPD)
- …

Bitumendämpfe und -aerosole

Die Emission von Dämpfen verdoppelt sich bei einer Temperaturerhöhung von 11 bis 12,5 °C – im für Asphalt relevanten Temperaturbereich (140 bis 190 °C).

In the temperature range relevant for paving applications (140 to 190 °C) the fume emission rate increases by a factor of 2 for about every 11–12.5 °C temperature increase.
(*H.C.A. Brandt, P.C. de Groot, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL 60:182–190 (1999)*)

⇒ **Niedrigtemperaturasphalt trägt zur Lösung der Problematik bei.**

Herausforderungen für Niedrigtemperatur - Bitumen

- Performance (Hohlraumgehalt)
- Wiederverwendbarkeit
- Umwelteigenschaften / Wassergefährdungsklasse
- CE – Kennzeichnung

Bindemittel für die Temperaturabsenkung von Asphalt

Modifizierung mit Wachsen – E KvB

- Keine CE-gekennzeichneten Bitumen
- Gegenüber Straßenbaubitumen veränderte Eigenschaften
- Gegebenenfalls verbesserte Standfestigkeit mit möglichen Einbußen bei der Kälteflexibilität

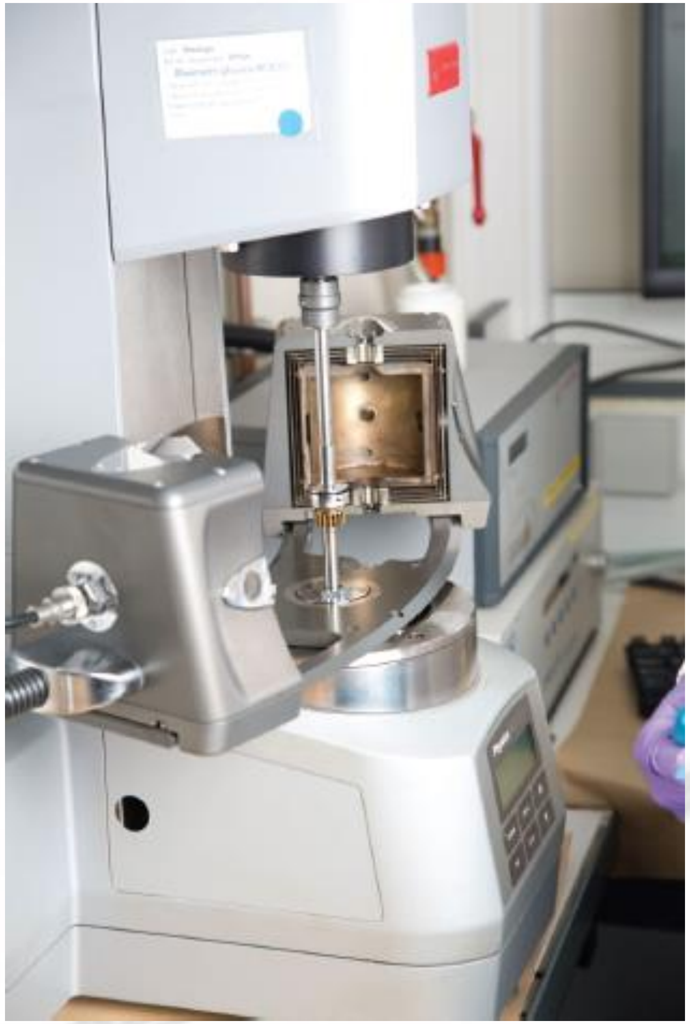
Shell Cariphalte Compact
Shell Bitumen Compact

Modifizierung mit chemischen Additiven

- CE-gekennzeichnetes Produkt, entsprechend TL Bitumen-StB
- Anpassung der Erstprüfungen von Asphalt ggf. erforderlich

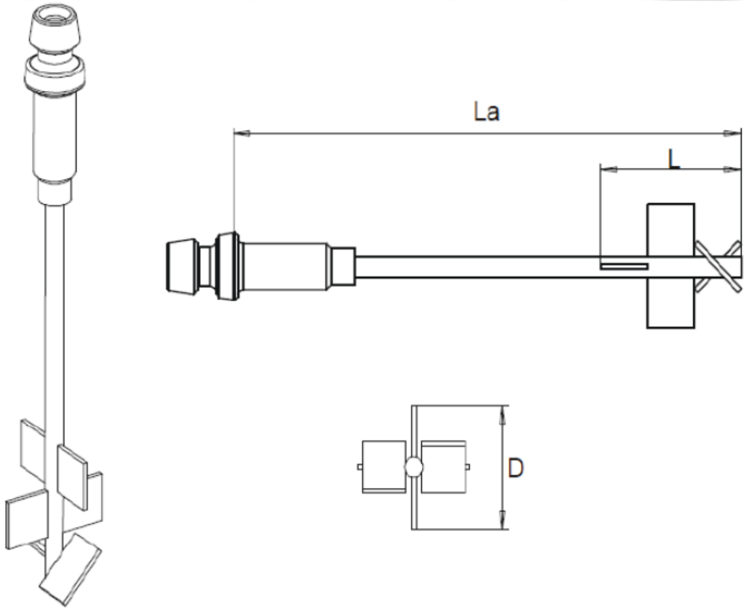
Shell Cariphalte LT
Shell Bitumen LT

Produktentwicklung: Rührversuch mit Füller

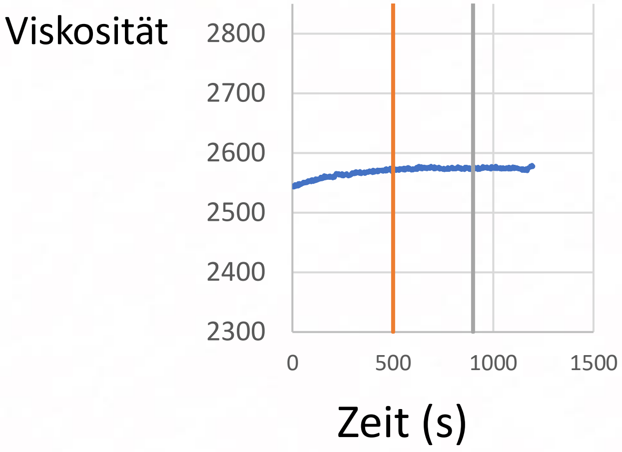


Quelle: Shell European Solution Centre, Strasbourg

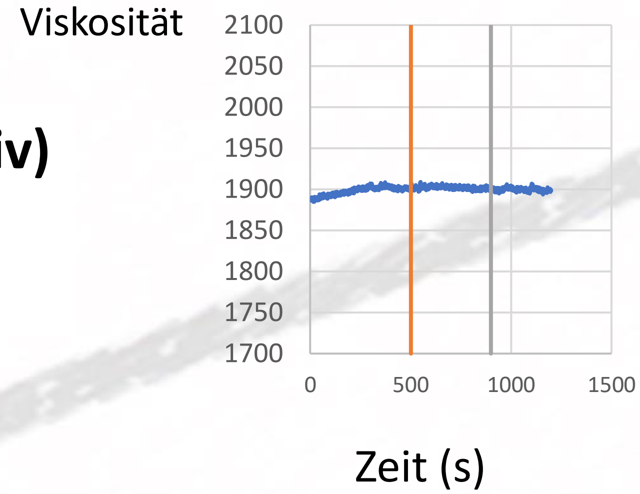
Shell Rührversuch im DSR (2018)
Bitumen + Füller 1:1,
Erprobung verschiedener Additive



**70/100 +
Kalksteinmehl
(1:1)**



**(70/100 + LT-Additiv)
+ Kalksteinmehl
(1:1)**



Viskositätsabsenkung bei 120 °C
um ca. 25 %

Quelle: Shell European Solution Centre, Strasbourg

straßen.nrw - Praxisanwendungen von Shell Cariphalte 25/55-55 LT

B 474 (Dülmen)

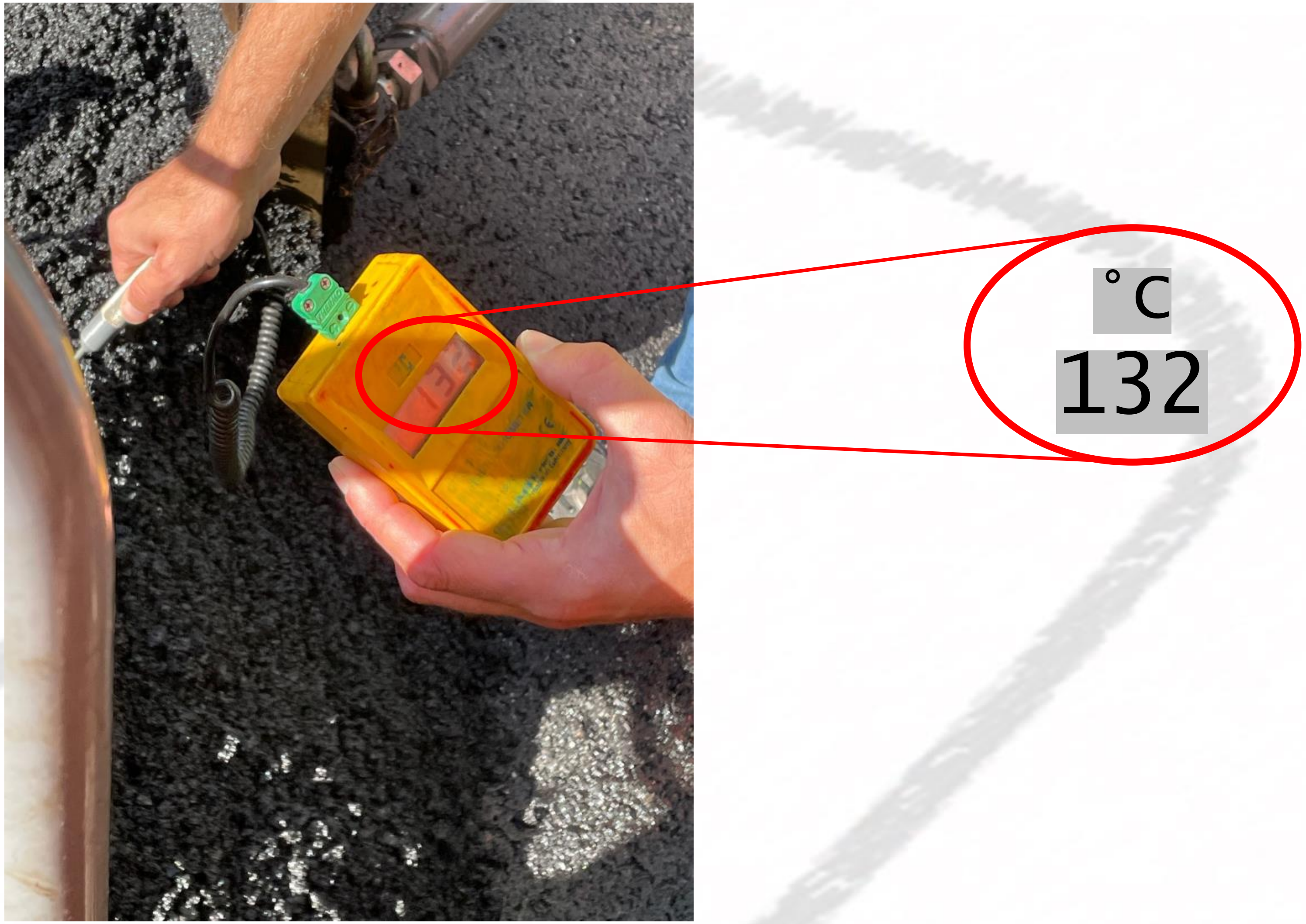
AC 16 BS, AC 11 DS mit PmB 25/55-55 TA (mit AG)
Mischtemperatur ~ 140 °C, Einbautemperatur (Bohle) 117 – 144 °C, im Mittel 130 °C.
➔Absenkung um 25 bis 30 °C, alle Anforderungen erfüllt.
➔Emissionsmessung: zwischen 0,3 mg/m³ (Walze, Bohle links) und 3,3 mg/m³ (Bohle rechts).

L 337 (Gummersbach)

AC 16 B S SG, AC 11 DS mit PmB 25/55-55 TA (mit AG)
Mischtemperatur ~140 – 150 °C, Einbautemperatur 135 – 145 °C.
Alle Anforderungen erfüllt.

Quelle: Martin Vondenhof

Bohle



Quelle: Martin Vondenhof

Betriebslizenz: (✓)

Wettbewerbsfähigkeit:

CO_2

Press release 13 April 2021:

HOLCIM BIETET ERSTEN KLIMANEUTRALEN ZEMENT IN DEUTSCHLAND AN

Quelle: www.holcim.de


Emissionen...
...vermeiden
...reduzieren
...kompensieren
350BAR
HYDROGEN
FUELING ONLY
PVS (sonnen)
Shell Wasserstoff
Shell Bitumen CarbonSink
Shell Bitumen RC LT
Shell Cariphalte Age Safe
Kraftstoffe & Energieträger
Shell Bitumen LT R
NBS

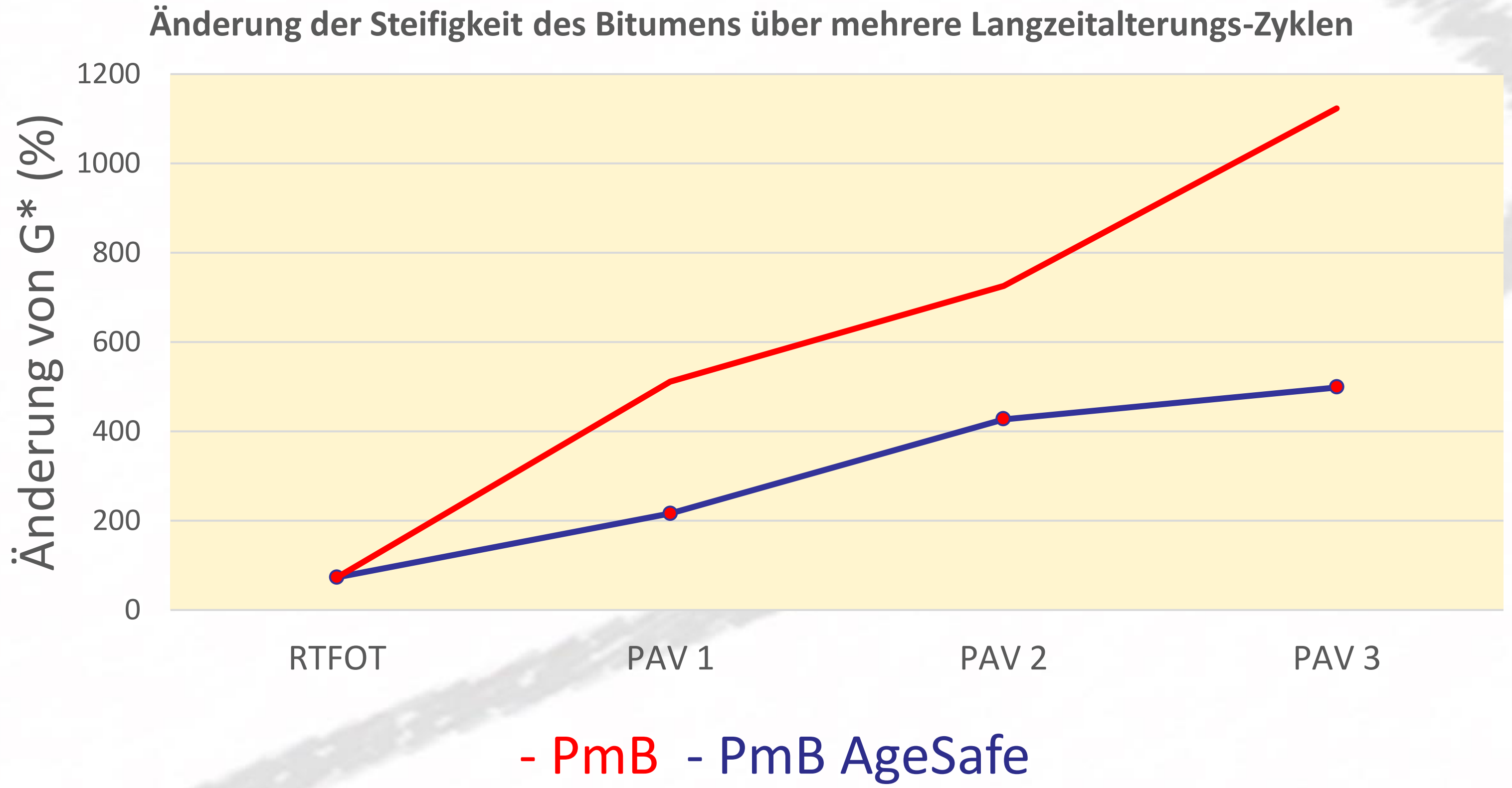
Performance und Nachhaltigkeit

- Bindemittel für Asphalt unter höchster Belastung
  - Gussasphalt: Shell Cariphalte Compact 10/30-75 VL
  - Gussasphalt: Shell Bitumen Compact 25/35 VH (E KvB)
  - OPA, SMA: Shell Cariphalte OPA 40/100-75
  - OPA (A6): Cariphalte OPA 55/85-70
  - Binderschichten: Shell Cariphalte RC 10/40-80

- Wiederverwendung:
  - Weiche Bitumen gemäß EN 12591 (160/220 bis 650/900)

Neue Entwicklungen

- Shell Cariphalte AgeSafe



Quelle: Shell Research & Technology Centre, Bengaluru

Vielen Dank für Ihre Aufmerksamkeit!