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Technical Data Sheet (TDS) – Bitumen PG 70-16

1. Product Identification

Product Name

Bitumen PG 70-16

Other Names

- PG 70-16 Bitumen
- PG 70-16 Asphalt Binder
- Asphalt PG 70-16
- Performance Grade Bitumen 70-16
- Performance Grade Asphalt Binder

Product Description

Bitumen PG 70-16 is a high-performance asphalt binder produced according to the Superpave Performance Grading (PG) system. The material provides excellent rutting resistance, thermal stability, durability, and fatigue performance under heavy traffic and high pavement temperature conditions.

Moreover, PG 70-16 asphalt binder performs effectively in hot climate regions and demanding infrastructure projects such as highways, airports, industrial pavements, and urban roads.

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2. Product Applications

Bitumen PG 70-16 suits a wide range of asphalt paving and infrastructure applications, including:

- Highways
- Expressways
- Airport runways
- Urban roads
- Heavy traffic pavements
- Industrial zones
- Port terminals
- Bridge decks
- Hot climate road construction
- Polymer modified asphalt systems

Additionally, engineers use PG 70-16 in projects that require superior resistance to rutting and pavement deformation.

3. Performance Grade Classification

Property	Classification
Performance Grade	PG 70-16
Maximum Pavement Design Temperature	70°C
Minimum Pavement Design Temperature	-16°C
Grading System	Superpave Performance Grade

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4. Technical Specifications

Typical Physical and Performance Properties

Property	Test Method	Specification
Performance Grade	AASHTO M320	PG 70-16
Flash Point	ASTM D92	Min 230°C
Rotational Viscosity @ 135°C	ASTM D4402	Max 3.0 Pa.s
Specific Gravity	ASTM D70	1.01–1.06
Solubility in Trichloroethylene	ASTM D2042	Min 99%
Dynamic Shear Rheometer (Original Binder)	AASHTO T315	G*/Sinδ ≥ 1.0 kPa
DSR After RTFO Aging	AASHTO T315	G*/Sinδ ≥ 2.2 kPa
Pressure Aging Vessel (PAV) Residue	AASHTO R28	Pass
Fatigue Cracking Parameter	AASHTO T315	G*Sinδ ≤ 5000 kPa
Bending Beam Rheometer (BBR) Stiffness	AASHTO T313	≤ 300 MPa
m-Value	AASHTO T313	≥ 0.300
Elastic Recovery (if modified)	ASTM D6084	As specified
Softening Point	ASTM D36	Report
Penetration @ 25°C	ASTM D5	Report

5. Key Properties of PG 70-16 Bitumen

High Temperature Stability

Bitumen PG 70-16 maintains excellent stiffness at elevated pavement temperatures. Consequently, the material resists rutting and permanent deformation under heavy traffic loads.

Rutting Resistance

The binder delivers strong resistance against wheel path deformation. Therefore, highways and industrial pavements maintain smoother surfaces for longer periods.

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Fatigue Resistance

PG 70-16 provides improved resistance to repeated traffic loading. As a result, pavements experience fewer fatigue cracks during long-term service.

Thermal Cracking Resistance

The material remains flexible at low temperatures down to -16°C. Therefore, it reduces thermal cracking risks during seasonal temperature changes.

Moisture Resistance

The binder offers excellent adhesion with aggregates. Consequently, the asphalt mixture resists stripping and water-related pavement damage.

Durability

PG 70-16 asphalt binder withstands oxidation and aging more effectively than conventional asphalt grades. Moreover, the material extends pavement service life and reduces maintenance frequency.

6. Advantages of Bitumen PG 70-16

- Excellent rutting resistance
- Superior heavy traffic performance
- Longer pavement life
- Reduced maintenance costs
- High-temperature stability
- Improved fatigue resistance
- Better moisture resistance
- Enhanced durability
- Suitable for hot climate roads
- Compatible with Superpave asphalt systems

7. Superpave Performance Grading Explanation

The Superpave grading system classifies asphalt binders according to pavement temperature performance.

Meaning of PG 70-16

Grade Component	Description
PG	Performance Grade
70	Maximum pavement temperature (°C)
-16	Minimum pavement temperature (°C)

Therefore, the binder performs effectively in climates where pavement temperatures reach up to 70°C while remaining resistant to cracking down to -16°C.

8. Typical Performance Characteristics

Performance Area	PG 70-16 Capability
Heavy Traffic Resistance	Excellent
High Temperature Stability	Excellent
Rutting Resistance	Excellent
Fatigue Resistance	Very Good
Low Temperature Flexibility	Good
Oxidation Resistance	Very Good
Moisture Damage Resistance	Very Good

9. Recommended Mixing and Compaction Temperatures

Operation	Recommended Temperature
Storage Temperature	150–170°C
Mixing Temperature	160–175°C
Compaction Temperature	145–165°C
Maximum Heating Temperature	190°C

Additionally, operators should avoid prolonged overheating because excessive temperatures may accelerate binder aging.

10. Packaging Options

Bitumen PG 70-16 is available in several packaging formats:

Packaging Type	Approximate Weight
Steel Drum	150–200 kg
Jumbo Bag	500–1000 kg
Bulk Tanker	Bulk Supply
Bitutainer	Bulk Export

11. Storage Recommendations

To maintain product quality:

- Store in dry and clean storage tanks
- Avoid water contamination
- Maintain recommended heating temperatures
- Prevent prolonged exposure to air
- Use insulated tanks when possible
- Rotate inventory regularly

Furthermore, proper storage helps preserve viscosity and performance characteristics.

12. Handling Precautions

- Use proper PPE during handling
- Avoid direct contact with hot material
- Ensure adequate ventilation
- Prevent overheating
- Follow industrial safety procedures
- Use heat-resistant gloves and eye protection

13. Transportation Information

PG 70-16 bitumen can be transported using:

- Bulk asphalt tankers
- Drums
- Jumbo bags
- Bitutainers

Moreover, transport systems should maintain proper temperatures to preserve product consistency during delivery.

14. Quality Control

Manufacturers typically conduct laboratory testing on each production batch to ensure compliance with:

- AASHTO M320
- ASTM standards
- Superpave requirements
- Internal quality specifications

Quality control testing may include:

- DSR testing
- RTFO aging
- PAV aging
- BBR testing
- Flash point testing
- Viscosity analysis

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15. Comparison with Other Asphalt Grades

PG 70-16 vs PG 64-22

Property	PG 70-16	PG 64-22
High Temperature Resistance	Higher	Moderate
Cold Temperature Flexibility	Moderate	Better
Rutting Resistance	Excellent	Good
Heavy Traffic Suitability	Excellent	Good
Hot Climate Suitability	Excellent	Moderate

PG 70-16 vs VG30

Property	PG 70-16	VG30
Grading Method	Performance-Based	Viscosity-Based
Climate Design	Yes	Limited
Rutting Resistance	Excellent	Moderate
Pavement Durability	Superior	Standard
Superpave Compatibility	Full	Limited

16. Typical Uses by Industry

Road Construction

Used for highways, expressways, and arterial roads.

Airport Infrastructure

Suitable for runways, taxiways, and airport aprons.

Industrial Infrastructure

Used in ports, container yards, and logistics zones.

Urban Development

Applied in city streets and municipal road projects.

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17. Compliance Standards

Bitumen PG 70-16 generally complies with:

- AASHTO M320
- ASTM D4402
- ASTM D92
- ASTM D2042
- AASHTO T315
- AASHTO T313
- ASTM D2872

18. Shelf Life

Under proper storage conditions, the product maintains stable properties for extended periods. However, prolonged overheating may affect performance characteristics.

19. Environmental Information

PG 70-16 should not enter waterways or soil systems. Therefore, operators should follow environmental handling and disposal regulations during storage and application.

20. Disclaimer

The information in this Technical Data Sheet reflects typical properties and current technical knowledge for Bitumen PG 70-16. Values may vary depending on production conditions and testing procedures. Users remain responsible for verifying product suitability for specific applications and compliance with local regulations.