

Polymer-Modified Asphalt Emulsions

CRS-2P · CRS-2L · CRS-2M · CRR-2M · CSS-1hP · CQS-1hP · HFRS-2P · HFMS-2sP

In accordance with AASHTO M 316 — Polymer-Modified Emulsified Asphalt, and the project specification

1. Description

Modified emulsions incorporate a polymer — SBR latex, solid SBS, natural rubber or recycled tyre rubber — into the base binder or into the emulsifier solution before emulsification. The polymer increases the cohesion and elasticity of the residual film, improves aggregate retention in surface treatments, widens the service temperature range and reduces stripping caused by heavy traffic and water.

2. Applications

- Double and triple surface treatments on high-traffic roads (CRS-2P, CRS-2M, CRR-2M).
- Chip seals on corridors with high loading and steep gradients.
- High-performance cold micro-surfacing and slurry seals (CQS-1hP).
- High-bond tack coats beneath thin overlays (CSS-1hP).
- High-float seals in climates of wide thermal swing (HFRS-2P, HFMS-2sP).

3. Specifications

Important normative note. Polymer-modified emulsions are governed by AASHTO M 316-18 (2022), "Standard Specification for Polymer-Modified Emulsified Asphalt", covering eleven cationic and anionic grades. The earlier title — "Polymer-Modified Cationic Emulsified Asphalt", 2013 edition — is inactive. ASTM publishes no equivalent specification: ASTM D977 and D2397 do not contemplate polymer modification, so designations such as CRS-2P are not ASTM grades. In practice the enforceable numeric values come from the contracting authority's specification and differ substantially between agencies. PRO-ROAD® formulates each modified emulsion against the specific project specification; the values in the table below are typical production values and not a sales specification.

Property	Method	CRS-2P	CSS-1hP	CQS-1hP	HFRS-2P
Saybolt Furol viscosity at 50 °C (s)	T 59	100–400	—	—	75–400
Saybolt Furol viscosity at 25 °C (s)	T 59	—	20–100	20–100	—
Storage stability, 24 h (%), max.	T 59	1.0	1.0	1.0	Passes
Particle charge test	T 59	Positive	Positive	Positive	Negative
Sieve test, retained on No. 20 (850 µm) (%), max.	T 59	0.10	0.10	0.10	0.10
Demulsibility (%)	T 59	40 min.	—	—	40 min.
Residue by distillation (%), min.	T 59	65	62	62	65
Oil distillate, % by volume of emulsion, max.	T 59	3.0	—	—	3.0
Polymer content, % by weight of asphalt residue, min.	—	3.0	3.0	3.0	3.0
Tests on the residue					
Penetration at 25 °C, 100 g, 5 s (0.1 mm)	T 49	90–150	40–90	40–90	100–200
Softening point, ring and ball (°C), min.	T 53	38	57	57	38
Ductility at 4 °C, 5 cm/min (cm), min.	T 51	30	—	—	30
Ductility at 25 °C, 5 cm/min (cm), min.	T 51	125	70	—	—
Elastic recovery (%), min.	T 301	50	—	50	60
Force ductility ratio f2/f1 at 4 °C, min.	T 300	0.30	—	—	—
Float test at 60 °C (s), min.	T 50	—	—	—	1,200
Solubility in trichloroethylene (%), min.	T 44	97.5	97.5	97.5	97.5

Typical PRO-ROAD® production values, aligned with the reference specifications of road agencies applying AASHTO M 316 (North Dakota §818, Louisiana DOTD Table 1002-4, Colorado DOT §702, ISSA A143 for micro surfacing). Warnings: (i) elastic recovery is determined by AASHTO T 301; some agencies use proprietary methods (ODOT TM 429, Tex-539-C, California Test 332 for torsional recovery) with different thresholds; (ii) the designation CRS-2M has no published agency specification — it is produced against the buyer's specification; (iii) the designation CRR-2M corresponds to the Colombian INVÍAS nomenclature for modified rapid-setting emulsion. Values guaranteed per batch are certified in the quality certificate.

4. Storage and transport

Asphalt emulsions must be stored above 5 °C, to prevent breaking by freezing of the water phase, and below 85 °C, to prevent boiling. During heating the product must be recirculated to avoid local overheating that would cause premature breaking. Bulk storage shall be in clean tanks, preferably vertical, to avoid product contamination and minimise the area in contact with air. The tank must have an agitation and/or recirculation system that guarantees complete homogeneity during storage. Where storage for extended periods is required, the product must be recirculated at least once every five days. Avoid contact with pressurised water, with emulsions of the opposite charge and with cement or lime residues in tanks and equipment.

5. Packaging and logistics

In bulk in tank trucks from 9 to 35 t · 20 t isotanks and flexitanks for export · 200 kg steel drums · 1,000 L IBCs · 1,000 kg lined big bags. HS code: 2715.00 (bituminous mixtures based on petroleum bitumen).

6. Quality control

Every batch shipped is accompanied by a laboratory-issued quality certificate reporting the tests required by the applicable standard, with traceable batch identification. Additional testing or independent third-party inspection (SGS, Bureau Veritas, Intertek, Cotecna) at origin or destination can be arranged at the customer's request.

Consult the product Safety Data Sheet (SDS) before handling.

The information in this data sheet is offered in good faith, based on PRO-ROAD's technical knowledge of its products and on the requirements of the standards cited. It does not constitute a sales specification or a warranty of results. The customer is responsible for verifying the suitability of the product for its intended use, for its correct handling and for its application in accordance with project specifications. Values guaranteed per batch are certified in the corresponding quality certificate.

