

Quick-Set Emulsions for Slurry Seal and Micro Surfacing

CQS-1 · CQS-1h · CQS-1hP · QS-1 · QS-1h

In accordance with AASHTO M 208 / ASTM D2397 with the exceptions of ISSA A105 (slurry seal) and ISSA A143 (micro surfacing)

1. Description

Quick-set emulsions are formulated to remain stable during mixing with aggregate and mineral filler and to break rapidly and in a controlled manner once the mix has been spread on the pavement. This behaviour allows the road to be reopened to traffic in very short times — of the order of one hour for micro surfacing — without compromising layer cohesion. The suffix "h" indicates a harder asphalt residue and the suffix "P" indicates polymer modification.

2. Applications

- Slurry seals Type I, II and III in accordance with ISSA A105.
- Cold micro surfacing in accordance with ISSA A143, including rut filling.
- Crack sealing and surface rejuvenation of moderately oxidised pavements.
- Thin wearing courses over structurally sound pavements.

3. Specifications

ISSA A105 and ISSA A143 refer expressly to AASHTO M 208 / ASTM D2397 for CQS-1h emulsions, with specific exceptions. A105 waives the cement mixing test for slurry seal emulsions.

ISSA A143 exceptions for cold micro surfacing (modified CQS-1h)

Property	Method	Requirement
Storage stability, 24 h (%), max.	T 59 / ASTM D6930	1 %
Residue by distillation (%), min.	T 59 / ASTM D6997	62 %
Softening point, ring and ball (°C), min.	T 53 / ASTM D36	57 °C (135 °F)
Penetration at 25 °C, 100 g, 5 s (0.1 mm)	T 49 / ASTM D5	40–90
Polymer content, % by weight of asphalt residue, min.	—	3 % solids based on weight of asphalt

Typical PRO-ROAD® production values

Property	Method	CQS-1	CQS-1h	CQS-1hP
Saybolt Furol viscosity at 25 °C (s)	T 59	20–100	20–100	20–100
Storage stability, 24 h (%), max.	T 59	1.0	1.0	1.0
Particle charge test	T 59	Positive	Positive	Positive
Sieve test, retained on No. 20 (850 µm) (%), max.	T 59	0.10	0.10	0.10
Residue by distillation (%), min.	T 59	57	57	62
Penetration at 25 °C, 100 g, 5 s (0.1 mm)	T 49	100–250	40–90	40–90
Softening point, ring and ball (°C), min.	T 53	—	—	57
Ductility at 25 °C, 5 cm/min (cm), min.	T 51	40	40	—
Elastic recovery (%), min.	T 301	—	—	50
Solubility in trichloroethylene (%), min.	T 44	97.5	97.5	97.5

Warning on normative variability. CQS-1h does not answer to a single requirement table: Caltrans requires a minimum residue of 57 % and a maximum sieve of 0.30 %; Oregon and Colorado require 62 % and 0.10 %; other agencies set 60 %. Saybolt Furol viscosity at 25 °C is specified as 15–90 s, 15–100 s or 20–100 s depending on the agency. Before issuing an offer or shipping a batch it is essential to identify the specification governing the project. The designation "CQS-1P" appears in no published agency specification: the correct designation for the modified quick-set emulsion is CQS-1hP.

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.

