



Standard Specification for Emulsified Asphalt¹

This standard is issued under the fixed designation D 977; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers thirteen grades of emulsified asphalt for use in pavement construction in the manner designated.

2. Referenced Documents

2.1 ASTM Standards:

D 140 Practice for Sampling Bituminous Materials²

D 244 Test Methods for Emulsified Asphalts²

D 3910 Practices for Design, Testing, and Construction of Slurry Seal²

3. Requirements

3.1 The emulsified asphalt shall be tested within 14 days of delivery. The emulsified asphalt shall be homogeneous after

thorough mixing provided separation has not been caused by freezing. Emulsified asphalts separated by freezing shall not be tested.

3.2 Emulsified asphalt shall conform to the requirements prescribed in Table 1.

4. Sampling

4.1 Samples of emulsified asphalt shall be taken in accordance with Practice D 140.

4.2 Samples shall be stored in clean, airtight sealed containers as specified in Practice D 140 at a temperature of not less than 4°C (39.2°F) until tested.

5. Test Methods

5.1 The properties of the emulsified asphalts given in Table 1 shall be determined in accordance with Test Methods D 244.

6. Keywords

6.1 anionic; emulsion; emulsified asphalt; high float; medium setting; rapid setting; slow setting

¹ This specification is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.41 on Emulsified Asphalt Specifications.

Current edition approved Feb. 10, 2003. Published April 2003. Originally approved in 1948. Last previous edition approved in 1998 as D 977-98.

² *Annual Book of ASTM Standards*, Vol 04.03.

TABLE 1 Requirements for Emulsified Asphalt

NOTE 1—QS-1H emulsions shall meet the requirements outlined in Practices D 3910 .

NOTE 2—QS-1h is used for Quick Set Slurry Seal systems.

Type	Rapid-Setting						Medium-Setting								
	RS-1		RS-2		HFRS-2		MS-1		MS-2		MS-2h				
Grade	min	max	min	max	min	max	min	max	min	max	min	max			
<i>Tests on emulsions:</i>															
Viscosity, Saybolt Furol at 25°C (77°F), SFS	20	100	...	...	...	...	20	100	100	...	100	...		
Viscosity, Saybolt Furol at 50°C (122°F), SFS	...	...	75	400	75	400	...	...	...	...	...	...
Storage stability test, 24-h, % ^A	...	1	...	1	...	1	...	1	...	1	...	1			
Demulsibility, 35 ml, 0.02 N CaCl ₂ , %	60	...	60	...	60	...	...	...	...	...	...	...
Coating ability and water resistance:															
Coating, dry aggregate	...	...	...	...	...	...	good	...	good	...	good	...		
Coating, after spraying	...	...	...	...	...	...	fair	...	fair	...	fair	...		
Coating, wet aggregate	...	...	...	...	...	...	fair	...	fair	...	fair	...		
Coating, after spraying	...	...	...	...	...	...	fair	...	fair	...	fair	...		
Cement mixing test, %	...	...	...	...	...	...	...	...	...	...	...	...
Sieve test, % ^A	...	0.10	...	0.10	...	0.10	...	0.10	...	0.10	...	0.10			
Residue by distillation, %	55	...	63	...	63	...	55	...	65	...	65	...			
Oil distillate by volume of emulsion, %	...	...	...	...	...	...	...	...	...	...	...	...
<i>Tests on residue from distillation test:</i>															
Penetration, 25°C (77°F), 100g, 5 s	100	200	100	200	100	200	100	200	100	200	40	90			
Ductility, 25°C (77°F) 5 cm/min, cm	40	...	40	...	40	...	40	...	40	...	40	...			
Solubility in trichloroethylene, %	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...			
Float test, 60°C (140°F), s	...	...	...	...	1200	...	...	...	...	...	...	...
Type	Medium-Setting						Slow-Setting						Quick Setting		
Grade	HFMS-1		HFMS-2		HFMS-2h		HFMS-2s		SS-1		SS-1h		QS-1H		
Grade	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
<i>Tests on emulsions:</i>															
Viscosity, Saybolt Furol at 25°C (77°F), SFS	20	100	100	...	100	...	50	...	20	100	20	100	20	100	
Viscosity, Saybolt Furol at 50°C (122°F), SFS	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Storage stability test, 24-h, % ^A	...	1	...	1	...	1	...	1	...	1	...	1	...	...
Demulsibility, 35 ml, 0.02 N CaCl ₂, %	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coating ability and water resistance:															
Coating, dry aggregate	good	...	good	...	good	...	good	...	...	...	...	...	...	...
Coating, after spraying	fair	...	fair	...	fair	...	fair	...	...	...	...	...	...	...
Coating, wet aggregate	fair	...	fair	...	fair	...	fair	...	...	...	...	...	...	...
Coating, after spraying	fair	...	fair	...	fair	...	fair	...	...	...	...	...	...	...
Cement mixing test, %	...	...	...	...	...	...	...	...	...	2.0	...	2.0	...	N/A
Sieve test, % ^A	...	0.10	...	0.10	...	0.10	...	0.10	...	0.10	...	0.10	...	0.10	
Residue by distillation, %	55	...	65	...	65	...	65	...	57	...	57	...	57	...	
Oil distillate by volume of emulsion, %	...	...	...	...	...	...	1	7	...	...	...	...	...	...
<i>Tests on residue from distillation test:</i>															
Penetration, 25°C (77°F), 100 g, 5 s	100	200	100	200	40	90	200	...	100	200	40	90	40	90	
Ductility, 25°C (77°F), 5 cm/min, cm	40	...	40	...	40	...	40	...	40	...	40	...	40	...	
Solubility in trichloroethylene, %	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...	
Float test, 60°C (140°F), s	1200	...	1200	...	1200	...	1200	...	...	...	...	...	...	...

^A This test requirement on representative samples is waived if successful application of the material has been achieved in the field.

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