



Fastener Adhesives 2353, 2353Y

Technical Data Sheet

December 2007

Supersedes Technical Data Sheet dated August 2004

General Description 3M™ Fastener Adhesives 2353 and 2353Y are microencapsulated, room-temperature curing adhesives that enhance the anchorage of threaded fasteners. The adhesives are designed to be coated on the fasteners and dried; they remain dormant until the shearing action of engaging the fastener into a nut or threaded cavity breaks the capsules and allows the adhesive to cure. Typical applications are fasteners for the engine compartment or safety-related parts.

Product Description	Product	Color	Description
	2353	Blue	Normal Temp Formula. Designed for applications where the service temperature will not exceed 116°C (240°F).
	2353Y	Yellow	

Physical Properties	Bulk adhesive	2353/2353Y
	% solid	59%
	Density	1030 kg/m ³ (8.6 lbs/gallon)
	Viscosity	1600 – 2400 cps
	Solvent Base	Toluene

¹Brookfield viscometer, RVF #4 spindle at 20 rpm.

Storage and Handling

Bulk Adhesive	2353/2353Y
Container sizes	18.9 liter (5 gallon) pails

Shelf life	Six months from the date of receipt by the customer
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Shelf life can be extended by re-mixing the adhesive regularly so that capsules do not coagulate on the bottom of the pails. Adhesive stored longer than six months from the date of receipt should be checked for performance prior to application on fasteners.

Storage Conditions	Store pails at 4°-38°C (40°- 100°F)
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PROTECT FROM FREEZING. Storage below 0°C (32°F) for extended periods will freeze the adhesive and make it totally unusable. Storage above 49°C (120°F) will shorten the shelf life of the adhesive. Inventory should be rotated on a FIFO (first-in, first-out) basis.

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Storage and Handling (continued)	Coated Fasteners	
	Shelf life	One year from date of adhesive application
		Shelf life can be as long as four years, depending on the storage conditions. Fasteners which are more than one year from the date of adhesive application should be checked for performance prior to use.
	Storage conditions	Store coated fasteners at 4°-38°C (40°- 100°F).

Performance Properties	Prevailing In Torque (PIT)	2353/2353Y
	Initial ¹	1 ft-lb (1.4 Nm)
	Break-Loose Torque (BLT)	
	Initial ¹	41 ft-lbs (55.8 Nm)
	Break-Away Torque (BAT)	
	Initial ¹	14 ft-lbs (19.0 Nm)
	Heat aging ²	No change (±10% of initial value)
	Cycles ³	No change (±10% of initial value)
	Water immersion ⁴	No change (±10% of initial value)
	Gasoline immersion ⁵	No change (±10% of initial value)
	Hot motor oil immersion ⁶	No change (±10% of initial value)
	Transmission fluid immersion ⁷	No change (±10% of initial value)
	Anti-freeze immersion ⁸	No change (±10% of initial value)
	Prevailing Out Torque (POT)	
	Initial ¹	11 ft-lbs (15.0 Nm)

NOTE: These properties are representative of the products' performance, and are supported by laboratory test data. However, the values reported are not intended to be used for specification purposes. All testing, unless otherwise stated, was performed on 3/8" x 16" plain steel bolts with matching plain steel nuts.

¹ 24 hours at room temperature

² 3 weeks at 104°C (220°F)

³ Conditioned under 3 of the following cycles: 1 1/2 hours at -56°C (-68°F),

1 hour at 177°C (350°F), and 1 1/2 hours at 24°C (75°F)

⁴ Immersion in distilled water for 1 week at 24°C (75°F)

⁵ Immersion in regular, unleaded gasoline for 1 week at 24°C (75°F)

⁶ Immersion in SAE 30 motor oil for 1 week at 24°C (220°F)

⁷ Immersion in transmission fluid for 1 week at 24°C (75°F)

⁸ Immersion in a 50% solution of ethylene glycol in water for 1 week at 49°C (120°F)

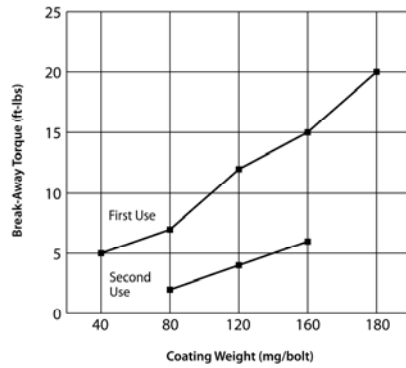
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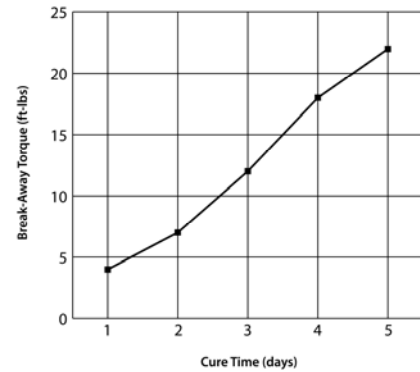
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Performance Properties (continued)

Break-Away Torque (initial) vs Adhesive Coating Weight



Break-Away Torque vs Cure Time (at room temperature)



Features, Advantages and Benefits

Features	Advantages	Benefits
Epoxy chemistry	High torque values on coated fasteners Environmental resistance (to heat, automotive fluids, vibration, thermal and mechanical shock)	Robust, structural bonding performance
2-part (microencapsulated)	Extended shelf life (bulk adhesive and coated fasteners) Controlled reactivity (adhesive activates and cures upon insertion) Reusability (additional capsules break with each re-insertion)	Convenient handling by the end-users
Flow coatable formula	Allows controlled application to fasteners; viscosity can be adjusted to achieve target coating weights Penetrates oil coatings Fast drying Bonds to a broad range of fastener finishes	Broad handling, dispensing and drying windows for the applicators

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Definition of Terms	<p><i>Prevailing in Torque (PIT):</i> The maximum torque reading obtained during insertion of a bolt into a nut prior to sealing, i.e., before fully torquing the bolt into place.</p> <p><i>Break-Loose Torque (BLT):</i> The initial torque reading obtained when a bolt is unscrewed after it has been sealed, i.e., fully torqued into place.</p> <p><i>Break-Away Torque (BAT):</i> The initial torque reading obtained when a bolt is unscrewed after it has not been sealed.</p> <p><i>Prevailing Out Torque (POT):</i> The maximum torque reading obtained when a bolt is being removed, excluding the BLT value; typically the value during the first full rotation of the bolt.</p>
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Health and Safety **Health and Safety Information:** Read all Health Hazard, Precautionary, and First Aid statements found in the Material Safety Data Sheet (MSDS) and/or product label prior to handling or use. Visit www.3M.com/msds to obtain an MSDS.

**Performance tests are run using standard test procedures. The values presented are typical values not to be used for specification purposes.

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Automotive Division

3M Center, Building 223-1S-02
St. Paul, MN 55144-1000
www.3M.com/autosolutions

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