

High Way Vibration Test of tire sealant impact on Vehicles balance

-----With different volume installation

Test Date: 2nd Apr. 2016

Test Vehicle: Nissan 230JM / FF

Test Product: -40°C anti-freezing Tire Sealant

Test Staff: Lu Yang, Chuankai Chen, Zhangpeng Yao, Xiangrong Chen, Junjie Wang, Qu Chen

Test Tire: Michelin 205/65R16 95V front | Bridgestone 205/65R16 95H rear

Test Purpose: Different installed volume of tire sealant impact on vehicle balance & passenger's vibration experience

Test Method: fill four tires of the car with different volume from 150ml~1200ml, each passenger fill the testing form with real feelings of vibration on specific speed, driver's testing form to be filled by front passenger.

Vibration experience of different passenger

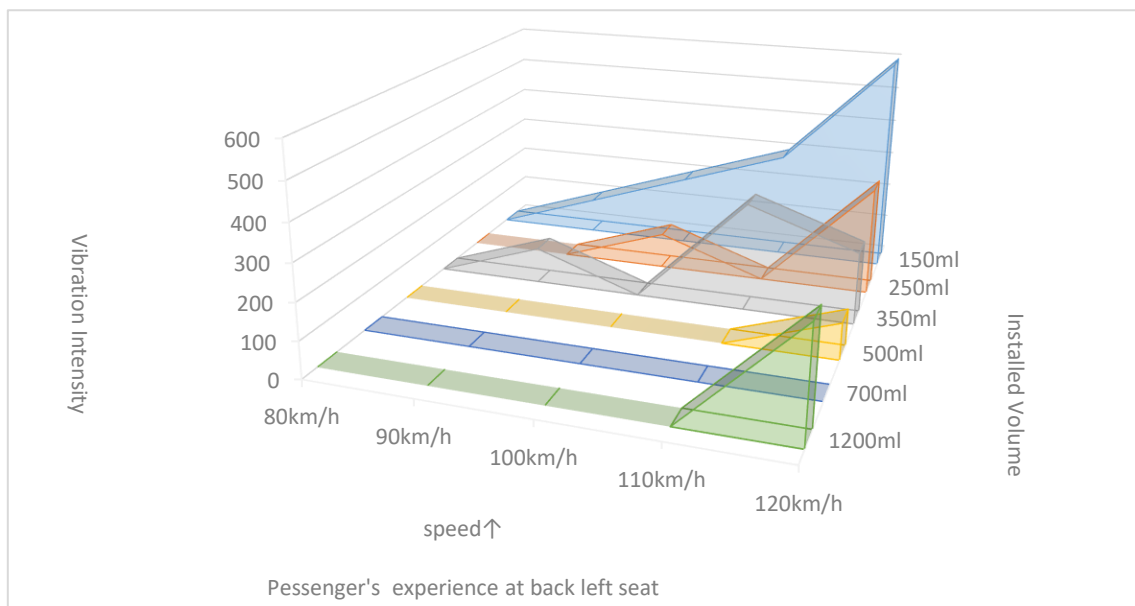
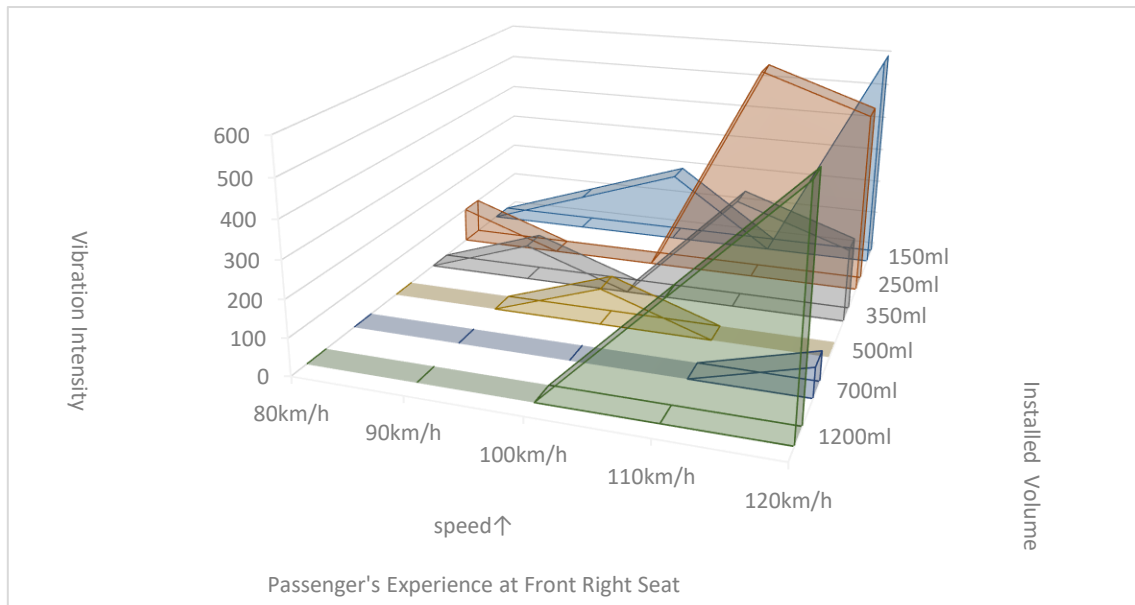
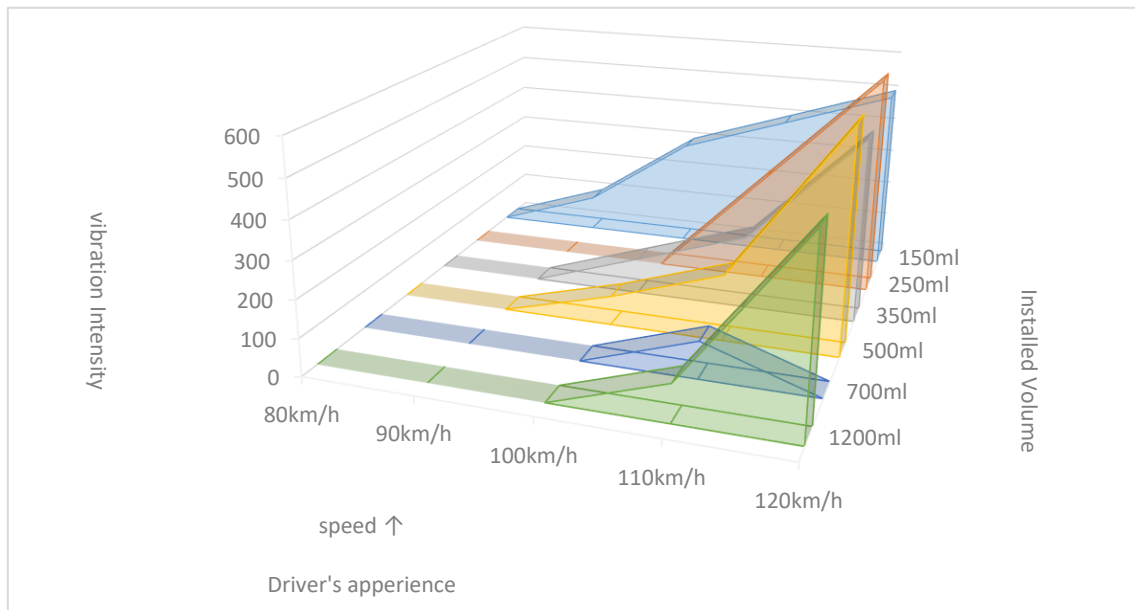
Volume installed	Car Speed	Drive Chuankai Chen	Front Right Zhangpeng Yao	Back Left Lu Yang	Back Right Junjie Wang
150ml	80km/h	Slight vibration (non-high way)			
	90km/h	Slight vibration	Slight vibration	Slight vibration	
	100km/h	Vibration strengthened	Vibration Obvious	Obvious Vibration	Slight vibration
	110km/h	Steering wheel vibrates		Obvious vibration	
	120km/h	Strong Vibration, widow vibrates (vibration reduced when speed become steady, vibration strengthened at speeding up or turning.)	Window vibrates (vibration reduced at steady speed and intensified on speeding up)	Window vibrates	Vibration Obvious
250ml	80km/h	Slight vibration	Slight vibration		
	100km/h			Slight vibration	Slight vibration
	110km/h	Steering wheel vibrates slightly	Window vibrates		
	120km/h	Steering wheel vibrates strongly	Vibration intensified	Obvious vibration, wag at turning	Obvious vibration

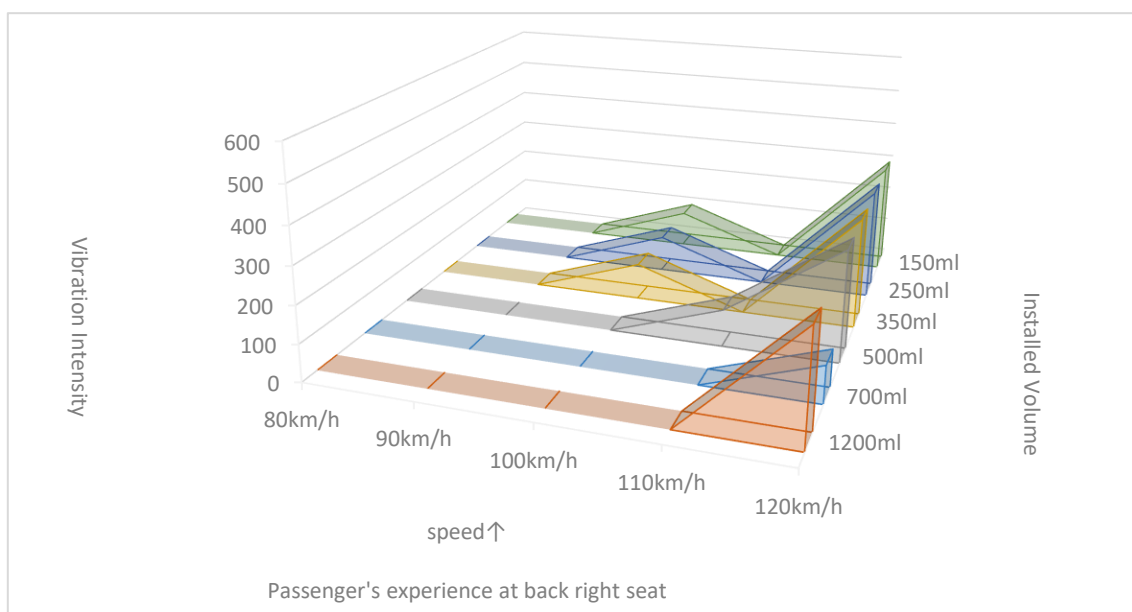
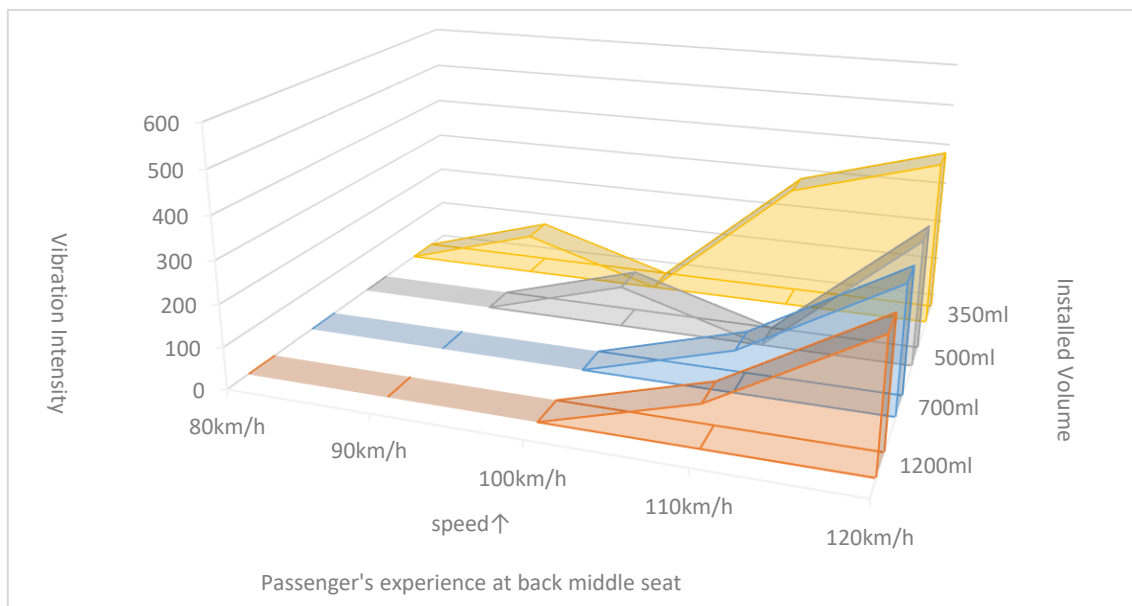
Volume installed	Car Speed	Drive Chuankai Chen	Front Right Zhangpeng Yao	Back Left Lu Yang	Back Right Junjie Wang	Back Middle Xiangrong
350ml	90km/h		Slight vibration	Slight vibration		Slight vibration
	100km/h	Slight vibration			Slight vibration	
	110km/h	Obvious vibration	Obvious vibration	Obvious vibration		Obvious vibration
	120km/h	Obvious vibration on steering wheel	Vibration faded at steady speed		Obvious vibration	Enhanced Vibration
500ml	100km/h	Slight vibration	Slight vibration			Slight vibration
	110km/h	Obvious vibration			Slight vibration	
	120km/h	Intensified vibration		Slight vibration	Obvious vibration	Obvious vibration
700ml	110km/h	Very slight vibration				Slight vibration
	120km/h		Very slight vibration		Slight vibration	Obvious
1200ml	110km/h	Slight vibration	Steering wheel and window vibrates			slight
	120km/h	Window vibrates, lower speed to 100km/h, then speed up to 110km/h, then to 120km/h without feeling any vibration	Intensified vibration (speed down to 100km/h, vibration disappear, then speed up to 120km/h without feeling any vibration)	Intensified vibration (lower speed then speeds up again to 120km/h, no vibration felt)	Obvious vibration	Vibration intensified

Give value to different level of vibrations as below

Slight vibration = 100; Obvious vibration = 300; Intensified vibration = 400; Steering wheel vibrates = 500; window vibrates = 600;

we draw chart as below ↓





Test Conclusion

From the multi-passenger high way vibration test, we can see

- ✓ At the phase from 150ml to 350ml volume installed, vibration become intensified as volume added up;
- ✓ At the phase with 500ml added, the vibration intensity reduced;
- ✓ When volume added up to 700ml, all passengers in the car feel very slight vibration;
- ✓ Then continue adding up to 1200ml, vibration suddenly strengthened and disappeared after lower speed then re-speed up to 120km/h;
- ✓ With all different volume added, vibration intensified at turning and speeding up, faded or disappeared when speed become steady;
- ✓ Passenger and driver at front seat first notice stronger vibration than those seated at back;
- ✓ Generally summary, when appropriate volume added from 500ml~700ml, passenger experience no obvious vibration under speed 100km/h, experience slight vibration at speed from 100km/h ~ 120km/h.

Remark:

This test report only states the objectiveness of the testing process under such testing environment (with such vehicle, such passengers under such weather and road conditions); every passenger in the test submitted their subjective experience under the principle of objective without prejudice; this test report does not constitute an evidence that other vehicles would have the similar vibration experience.

Suggestion:

1. Customer shall be told there might be vibration occurs with cars when speed exceeds 100km/hour
2. Suggested volume is the minimum volume, use below volume for each tire size

Tire size	14-inch	15-inch	16-inch	17-inch	18-inch	19-inch
Volume	510ml	580ml	660ml	730ml	860ml	930ml

3. Avoid sudden speed up, speed up gradually & smoothly.
4. When you feel vibration, slowly slow down till vibration disappears, and try to speed up gradually and slowly.
5. Slow done during turning.
6. If possible, better to have passengers evenly seated to keep car balance in weight.
7. Use standard pressure, do not pump above standard tire pressure.

Tested Date: 2nd Apr. 2016

Report Date: 28th Apr. 2016

Signature & Stamp:

Patrick

Yang

