

# Eppendorf Certificate

## Declaration of Conformity

Product: MixMate®  
 Order No. International: 5353 000.014  
 Order No. North America: 022674200

The device was tested in accordance with EN ISO 5349-1:2001 “Mechanical vibration – Measurement and assessment of human exposure to hand-transmitted vibration – Part 1”

### Hand-arm vibration assessment of MixMate® in accordance with EN ISO 5349-1:2001

Tests were performed on the MixMate operated in the “touch vortex” operation mode (3,500 rpm) with 15 mL and 50 mL conical tubes. The total vibration value was measured, the daily vibration exposure and the exposure points calculated from it.

The exposure action value **EAV of 2.5 m/s<sup>2</sup> A(8)** is equivalent to 100 exposure points and is the level at and above which hand-arm-vibration management procedures must be initiated where employees are regularly exposed to this level of vibration exposure.

The exposure limit value **ELV of 5 m/s<sup>2</sup> A(8)** is equivalent to 400 exposure points and must not be exceeded on any work day. If it is, immediate measures must be taken to control vibration levels or reduce exposure times to limit daily vibration exposure to below the ELV.

Usage pattern: Each test consisted of a representative usage pattern equivalent to 5 successive touch vortex operations of 30 seconds with 5 second intervals in a total of 2 minutes 30 seconds “on” and 20 seconds “off”. Tubes were filled with 2/3 of water.	Tube	Total vibration value m/s <sup>2</sup>	Daily exposure value m/s <sup>2</sup>	1 HOUR exposure points	Time – single tool use: For not exceeding	
					EAV	ELV
					2.5 m/s <sup>2</sup> minutes	5 m/s <sup>2</sup> minutes
	15 mL	5.2	1.8	54	111	444
	50 mL	9.4	3.3	177	34	136

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## Exposure Action Value (EAV)

The table indicates that the operator using 15 mL conical tubes in touch vortex mode (3,500 rpm) with reported usage would reach the EAV in 111 minutes and using 50 mL conical tubes in 34 minutes. Based on a usage pattern of 30 seconds vortex/5 seconds gap for changing the tube, this means that approximately 190 × 15 mL or 58 × 50 mL conical tubes could produce exposures that reach the EAV. With a usage pattern of 15 seconds vortex/5 seconds gap, 333 × 15 mL tubes or 102 × 50 mL tubes may be vortexed without exceeding the EAV. With a usage pattern of 45 seconds vortex/5 seconds gap 133 × 15 mL tubes or 40 × 50 mL tubes may be vortexed.

## Exposure Limit Value (ELV)

The table indicates that the operator using 15 mL conical tubes in touch vortex mode (3,500 rpm) with reported usage would reach the ELV in 444 minutes and using 50 mL conical tubes in 136 minutes. Based on a usage pattern of 30 seconds vortex/5 seconds gap, this means that approximately 761 × 15 mL conical tubes or 233 × 50 mL conical tubes could produce exposures that reach the ELV. Immediate action must thus be taken to limit exposures to below the ELV. With a usage pattern of 15 seconds vortex/5 seconds gap, 1332 × 15 mL tubes or 408 × 50 mL tubes may be vortexed until the ELV is reached. With a usage pattern of 45 seconds vortex/5 seconds gap 532 × 15 mL tubes or 163 × 50 mL tubes may be vortexed.

Vortex time (5 seconds gap)	Number of tubes to reach EAV/for not exceeding ELV			
	EAV	ELV	EAV	ELV
	15 mL		50 mL	
15 seconds	333	1332	102	408
30 seconds	190	761	58	233
45 seconds	133	532	40	163

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