

MAHARASHTRA POLLUTION CONTROL BOARD

Oct'2013

TESTING OF FIRE-CRACKERS TO ASSESS THE COMPLIANCE OF NOISE LEVEL STANDARDS PRESCRIBED UNDER ENVIRONMENT (PROTECTION) RULES, 1986.

1. Introduction:

Bursting of fire crackers create significant noise pollution during the Diwali Festival. MPCB for last few years is trying to create public awareness towards the high noise levels generated during the bursting of the crackers and its associated adverse health impacts. As a part of awareness activity, MPCB has carried out



testing of fire crackers to assess the compliance of noise levels standards prescribed under Environment (Protection) Rules, 1986. Tests were conducted during **7th Oct -14th Oct'2013** at **Mumbai, Pune, Nagpur, Nashik, Aurangabad and Kolhapur** in association with Police department, NGO's and Petroleum and Explosives Safety organization, Nagpur. Testing of Fire crackers were carried out at these locations in presence of local media to create awareness among people and children's. In Mumbai AWAAZ Foundation was associated with MPCB for testing.



Noise standards for fire crackers have been notified vide GSR No.682 (E) dated 5th October, 1999 under the Environmental (Protection) Act. As per this notification, the manufacture, sale or use of fire crackers generating noise levels exceeding 125 dB (A) or 145 dB (C)_{pk} at 4 meters distance from the point of bursting are prohibited for individual fire crackers. For fire crackers in series, these noise limits are suitably made more stringent depending upon the number of crackers in series.

2. Observations:

Samples of crackers of different types from various companies available in local market were procured. They were tested at where open space was available with firm ground surface. In Nagpur testing was carried out at Departmental testing Station, Petroleum and Explosives Safety organization, Gondakhairy, Nagpur. Testing at all the



above said locations, Type I noise meters were used, one for **peak** measurements and another for **Impulse** measurements. The noise measurements were made at 5 mtr. distance from the fire crackers. The values of the noise monitoring are given below at **Annexure-1 to 6** and a Noise standard for fire crackers is **Schedule-1**:

Following tables shows details of the crackers tested at **Mumbai, Pune, Nagpur, Nashik, Aurangabad and Kolhapur** and their compliance status with respect to Environment (Protection) rules 1986

Testing of firecrackers to assess the compliance of noise level standards prescribed under Environment (Protection) Rules, 1986.

Violation observed for the crackers which are in **series**

Place	No of tested brands	Violence of standard		Total no. of violations	Tested on
		Impulse	Peak		
Mumbai	6	6	6	6	14.10.2013
Nagpur	3	nil	2	2	09.10.2013
Pune	4	2	1	2	11.10.2013
Nashik	3	nil	1	1	14.10.2013
Kolhapur	5	5	5	5	11.10.2013
Aurangabad	4	nil	1	1	07.10.2013
Total	25	13	16	17	

Violation observed in single crackers

	No of tested brands	Violence of standard		Total no. of violations	Tested on
		Impulse	Peak		
Mumbai	10	1	1	1	14.10.2013
Nagpur	23	5	7	7	9.10.2013
Pune	8	4	3	4	11.10.2013
Nashik	8	nil	nil	nil	14.10.2013
Kolhapur	7	1	nil	1	11.10.2013
Aurangabd	8	nil	nil	nil	7.10.2013
Total	64	11	11	13	

Note: Noise Standards for single crackers: Impules -125 dB(A), Peak-145 dB (C)

Noise Standards for crackers in series : The above noise limit be reduced by $5 \log_{10} (N)$ dB, where N=No of crackers joined together



As far as crackers in series are concerned, tests were carried out for 25 different no. of brands. Out of which 13 no. of violations with respect to **impulse** standard and 11 nos of violations with respect to **peak** standard were observed. In case of single crackers tests were done for 64 no. of brands, out of which 13 no. of violations were observed. In totality, the manufacturers taken into consideration based upon availability of their brands of single and Series crackers (89 Nos), 30 nos of brands are violating one or

other noise standards (impulse or peak) and are not complied with the EP Noise Rules 1986 , amended in 1999.

The values of the noise monitoring are given at **Annexure-1 to 6 for Mumbai, Pune, Nagpur, Nashik, Aurangabad and Kolhapur**

TESTING OF FIRE CRACKERS AT RCF GROUND CHEMBURMUMBAI- 14.10.2013

Sr.No.	Name of Company	Brand name of fire cracker	Noise Level limit written on the firecracker	Chemical composition written on the	Sound pressure level	Sound pressure level
				firecracker	IMPULSE (Max)	PEAK (Max)
					In dB(A)	In dB(C)
Single firecrackers			Y/N	Y/N	Max. allowable decibel= 125	Max. allowable decibel= 145
1	Classic Fireworks, Terkheda, near Khamarwadi	All Rounders Green Atom Bombs	N	Y	116.5	126.4
2	J.K.Fireworks Tarheda	Golden Sounds	N	Y	117.4	129.2
3	Vijaya Fireworks Industries	Assorted Fountains	N	Y		
4	Parasakthi Fireworks Industries, Sivakasi	Multiple Colour Stars	N	Y	112.4	117.7
5	Nayagi Fireworks Pvt.Ltd. Sivakasi	Nayagi Monty	N	N	114.5	116.4
6	Nayagi Fireworks Pvt.Ltd. Sivakasi	Nayagi Shrek	N	N	114	114.9
7	Shama Fireworks Industries	Volcano	N	Y	127.4	128.9
8	Standard Fireworks,(P) Ltd, Thiruthangal Road, Sivakasi	Thunder bomb	N	N	117.4	130
9	Maratha Fireworks Industries, Nasik	Lion King	N	Y	119.7	128.4
10	Parasakthi Fireworks Padasalai, Sivakasi	Bold & Beautiful 2 in 1	N	Y	117.1	125.9
SERIES FIRE CRACKERS						
Sr.No.	Name of Company	Brand name of fire cracker	Noise Level limit written on the firecracker	Chemical composition written on the	Sound pressure level	Sound pressure level
				firecracker	IMPULSE (Max)	PEAK (Max)
					In dB(A)	In dB(C)
1	Divya pyrotechnics, Sivakasi	1000 wala	N	N	112.6 (std 105)	119.4 (std 125)

2	The corporation Fireworks Factory, Sivakasi	1000 shells	N	Y	118.9 (std 105)	125.1 (std 125)
3	Standard Fireworks	Colour Smoke Crackers	N	N	71.1	76.2
4	Nayagi Fireworks Pvt.Ltd. Sivakasi	Royal Jaguar	N	N	117.1 (std 117)	117.4 (std 122)
5	Shri K.R.S. Fireworks, Sivakasi	5000 wala	N	N	114 (std 102)	114.2 (std 122)
6	Coronation Fireworks Factory, Sivakasi	Chak De India 5000 shells	N	Y	120.3 (std 102)	122 (std 122)

**Testing of Fire Crackers at MIT College, Cricket ground, Kothrud, Pune
dated 11/10/2013**

S. No.	Name of Company	Brand Name of Fire Cracker	Sound Pressure Level Impulse (Max) in dB(A)	Sound Pressure Level Peak (Max) in dB(C)
A	Single Cracker		Max allowable decibel=125	Max allowable decibel=145
01	Charminar Fireworks Industries, 516/1, Chincholi Road, Sangola, Maharashtra	Golden Samrat Square	<u>132.4</u>	<u>148.4</u>
02	Anil Fire Works, Sivkasi	Laxmi	<u>126.7</u>	142.7
03	Parasakthi Fireworks Industries3, A.V.T. Padasalai Street, Sivakasi	Dynamite Bomg (Green)	<u>130.7</u>	<u>146.5</u>
04	Anil Fire Works, Sivkasi	Mother Baby	123	138.7
05	Supreme Pyrotechnic, 91/E-1 C.P.K.S.A Road, Sivakasi	Googy Hoogy	115	134.9
06	Shri Ganeshkumar Fireworks, Sivakasi	Delux Laxmi	123.3	140.7
07	Supreme Pyro Works, Sivakashi	Bharat Ka Hungama	113.6	138.6
08	Charminar Fireworks Industries, 516/1, Chincholi Road, Sangola, Maharashtra	Sutali Atom bomb (Apolo)	<u>131</u>	<u>147.3</u>
B	Series Cracker			
09	Anil Fire Works 8, A.V.T. South Street, Sivakasi	Motha Tukada (Lavangi) (30 Nos)	<u>118</u> (Limit-117.76)	136.3 (Limit-137.76)
10	Shri Pothi's, Sivakasi	2000 wala lad	<u>118</u> (Limit-108.5)	<u>132.4</u> (Limit-128.5)
11	Supreme Pyrotechnic, 91/E-1 C.P.K.S.A Road, Sivakasi	Multi Colour shots (50)	106.5 (Limit-116.5)	129.7 (Limit-136.5)
12	Vijaya Fireworks Industries, Sivakasi	Mother Baby (28 Nos)	111.3 (Limit-117.76)	134.1 (Limit-137.76)

Nagpur.

Annexure 1									
SAMPLE COLLECTION FROM MARKET									
Sr No	Sample No	Manufacturer	Brand Name	Name of Shop	Purchase by/team	Purchase date	Tested on	Sound Level Results	
								Standard	Observed Value
								RD-1	RD-2
1	1	Sri Rama Fireworks, Sivakasi	Gold Laxmi	Lothi Trading Company, Chandibagh	team	09/10/2013	09/10/2013	D) A#(125 dBmax) 123.8	123.1
2	2	Jumbo Fireworks, Sivakasi	Ashoka Batta	---	team	09/10/2013	09/10/2013	D) C)pk(145 dBmax) 142.0	139.2
3	3	Sri Rama Fireworks, Sivakasi	Hydro Bomb	---	team	09/10/2013	09/10/2013	D) A#(125 dBmax) 120.1	120.5
4	4	Standard Fireworks, Sivakasi	Hydrogen Bomb Foil	---	team	09/10/2013	09/10/2013	D) C)pk(145 dBmax) 121.9	122.8
5	5	Rishikesh Fireworks, Sivakasi	Creech Deluxe	---	team	09/10/2013	09/10/2013	D) C)pk(145 dBmax) 141.3	141.6
6	6	Sri Rama fireworks, Sivakasi	300 tad ✓	Madhavi Traders, Chandibagh, Nagpur	team	09/10/2013	09/10/2013	D) A#(112.6 dBmax) 109.1	110.2
7	7	Thilagamathi Fireworks, Sivakasi	Lion	---	team	09/10/2013	09/10/2013	D) C)pk(132.6 dBmax) 130.1	120.8
8	8	Standard Fireworks, Sivakasi	Electric Crackers	---	team	09/10/2013	09/10/2013	D) A#(125 dBmax) 116.7	116.7
9	9	Standard Fireworks, Sivakasi	Standard deluxe Bullet Bamba	---	team	09/10/2013	09/10/2013	D) C)pk(145 dBmax) 136.4	137.5
10	10	Jyothi Fireworks, Sivakasi	Melamin Electric Crackers	---	team	09/10/2013	09/10/2013	D) A#(125 dBmax) 120.4	120.7
11	11	Jumbo Fireworks Industries	Jyothi Brand Jambha Baji Crackers	Asian Explosives Chandibagh	team	09/10/2013	09/10/2013	D) A#(125 dBmax) 119.6	116.9
12	12	Alaka Jyothi Fireworks, Sivakasi	3" Laxmi	---	team	09/10/2013	09/10/2013	D) C)pk(145 dBmax) 149.2	145.7
13	13	Alaka Jyothi Fireworks, Sivakasi	Bullet	---	team	09/10/2013	09/10/2013	D) A#(125 dBmax) 126.5	128.7
14	14	East Ruban Fireworks, Sivakasi	Hungama Deluxe	---	team	09/10/2013	09/10/2013	D) C)pk(145 dBmax) 103.6	109.9
15	15	Standard Fireworks, Sivakasi	Colour Smoke Crackers	---	team	09/10/2013	09/10/2013	D) A#(115.0dBmax) 110.0	117.0
16	16	Purita Fireworks, Sivakasi	100 wala ✓	Navarata and Sons, Chandibagh	team	09/10/2013	09/10/2013	D) C)pk(135.0 dBmax) 125.8	129.0

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SAMPLE COLLECTED FROM MARKET											
Sr No	Sample No	Manufacturer	Brand Name	Name of Shop	Purchase by/team	Purchase date	Tested on	Sound Level Results			
								Standard	Observed Value		
								Rdg-1	Rdg-2		
17	17	Shankar Fireworks	Bullet Bomb	--do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	115.1 135.6	114.1 129.2	
18	18	Bandukwala Fireworks, Akola	Nitrogen Green Bomb	-do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	127.4 148.4	128.4 146.9	6
19	19	Ponmalay Fireworks, Sivakasi	24 defuse	-do---	team	09/10/2013	09/10/2013	i) A1(118.4dBmax) ii) Cpk(138.0 dBmax)	111.2 126.2	112.2 132.3	
20	20	Shiv Shakti Fireworks, Rajapalayam	Atom Bomb Small	-do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	123.2 144.3	120.7 141.3	7
21	21	Metro Fireworks, Sivakasi	Metro	-do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	120.7 141.3	122.3 149.6	7
22	22	Thirumeenakshi Fireworks Industries, Sivakasi	200 wala ✓	Chandak Fireworks, Nagpur	team	09/10/2013	09/10/2013	i) A1(113.4dBmax) ii) Cpk(133.4 dBmax)	104.2 124.9	114.2 137.4	8
23	23	Sri Adhigarasakthi, Fireworks, Sivakasi	Sholay Big Atom Bomb	---do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	121.4 142.1	117.4 137.2	
24	24	Vyankatesh Fireworks, Sivakasi	2 sound	---do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	097.5 119.9	111.3 132.6	
25	25	Sri Dhantavaasivel Fireworks, Sivakasi	Laxmi 4 "	---do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	132.5 155.4	130.6 154.0	9
26	26	Shankar Fireworks, Sivakasi	Bullet Bomb	---do---	team	09/10/2013	09/10/2013	i) A1(125 dBmax) ii) Cpk(145 dBmax)	116.8 140.5	110.4 133.7	

(Sajay Kumar)
Controller of
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**Testing of Firecrackers at Basket Ball Ground, Sapkal Knowledge Hub, Kalyani Hills, Anjneri,
Trambakeshwer, Dist. Nashik. On dated. 14/010/2013**

Sr. No.	Name of Company	Brand Name of Fire cracker	Noise level limit written on the firecracker	Chemical composition written on the firecracker	Sound pressure level IMPULSE (Max) In dB (A)	Sound pressure level PEAK (Max) In dB (C)
Single firecrackers			Y/N	Y/N	Max. allowable decibel=125	Max. allowable decibel=145
1	Standard Fire Works (P) Ltd., Shivakashi	Cracking King	N	N	102.4	104.6
					99.2	101.6
					81.5	82.7
2	Standard Fire Works (P) Ltd., Shivakashi	Aerial Out	N	N	88.7	96.9
					81.7	85.4
					87.7	101.8
3	Standard Fire Works (P) Ltd., Panthuarpatti, Melapudhur	2 Sound Crackers	Y (Not exceed 125 dB(A))	N	90.2	96.4
					62.3	83.6
					81.4	84.3
4	Standard Fire Works (P) Ltd., Thiruthangal road, Shivakashi	Kargil Bullets	N	N	86.3	94.6
					91.2	98.1
					85.9	93.8
5	Standard Fire Works (P) Ltd., Thiruthangal road, Shivakashi	Triple Gun	N	N	70.2	78.2
					85.6	100.3
					80.4	85.4
6	Standard Fire Works (P) Ltd., Thiruthangal road, Shivakashi	Giant Color Flower	N	N	71.1	79.2
					75.4	81.1
					70.1	80.0
7	Standard Fire Works (P) Ltd., Shivakashi	Giant Crackers	Y (Not exceed 105 dB(A))	N	70.1	78.4
					103.1	105.6
					89.3	90.1
8	New Maratha Fire Works Ind. Rashegaon, Nashik	Johny Bomb	N	(Approx) KN03- 68.75% AL- 18.75% S - 12.49%	99.3	104.8
					98.8	111.4
					113.0	125.3

Fire Crackers in Series

Sr. No.	Name of Company	Brand Name of Fire cracker	Noise level limit written on the firecracker	Chemical composition written on the firecracker	Standards	Observed Levels
1	Standard Fire Works (P) Ltd., Thiruthangal Road, Shivakashi	Red Fort 600 Shell	Y (Not exceed 105 dB(A))	N	I) AI (111.1 dB Max) II) CPK (131.1 dB Max)	104.0 125.3
2	Standard Fire Works (P) Ltd., Thiruthangal Road, Shivakashi	Red Fort 1000 Shell	Y (Not exceed 105 dB(A))	N	I) AI (110.0 dB Max) II) CPK (130.0 dB Max)	108.2 125.6
3	Standard Fire Works (P) Ltd., Thiruthangal Road, Shivakashi	Red Fort 5000 Shell	Y (Not exceed 105 dB(A))	N	I) AI (106.5 dB Max) II) CPK (126.5 dB Max)	103.3 124.6

From the above results, it is observed that, all results are within permissible standards. Hence, it may conclude that, there is no violations with respect to IMPULSE standards as well as PEAK standards were observed.

Testing of Fire Crackers at Jhalani Ground MIDC Chikalhana, Aurangabad

Date : 07/10/2013 Time : 11:00 A.M.

Sr. No.	Name of Company	Brand name of fire Cracker	Sound pressure level IMPULSE (Max) In dB(A)	Sound pressure level PEAK (Max) In dB(C)
Single Crackers			Max allowable decible = 125	Max allowable decible = 145
1	Shyam Fire Works Industry, Shirsoli, Jalgaon	Vulcano	Avg: 84.9 Max: 88.0 Min: 80.2	Avg: 96.77 Max: 99.6 Min: 94.4
2	Bandukwala Fire Work, Shiloda, Akola	Pukar Bomb green	Avg: 76.7 Max: 78.3 Min: 74.2	Avg: 92.3 Max: 98.2 Min: 87.4
3	Sri Vijai Fire Works, Sivakasi	Laxmi Bomb	Avg: 80.6 Max: 90.3 Min: 70.6	Avg: 99.9 Max: 101.1 Min: 99.1
4	Sri Vijay Pyrotechnic factory, Sivakasi	Magic Fountain	Avg: 80.1 Max: 88.3 Min: 75.4	Avg: 96.15 Max: 99.0 Min: 89.9
5	Jyoti Fire Works, Sivakashi	Hydro Bomb Green	Avg: 79.0 Max: 88.3 Min: 70.2	Avg: 89.1 Max: 97.7 Min: 83.3
6	Sri Kalishwari Fire Works, Sivakashi	Bullet bomb	Avg: 81.3 Max: 88.3 Min: 73.4	Avg: 93.4 Max: 99.1 Min: 87.6
7	Cock Brand-Sri Kalishwari Fire Works Sivakashi	Lavangi bomb	Avg: 73.4 Max: 88.4 Min: 66.2	Avg: 84.3 Max: 92.3 Min: 70.4
8	Sri Vijay Pyrotechnic factory, Sivakasi	Anar	Avg: 92.3 Max: 93.4 Min: 91.3	Avg: 104.2 Max: 105.2 Min: 103.2
Crackers in series			Max allowable decible = 105	Max allowable decible = 105
9	Standard Fire works, Sivakashi	Music Party	Avg: 82.2 Max: 85.2 Min: 79.2	Avg: 94.9 Max: 100.1 Min: 92.0
10	Standard Fire works, Sivakashi	2000 Shells	Avg: 86.1 Max: 95.2 Min: 74.7	Avg: 95.4 Max: 111.2 Min: 90.2
11	Sony fire works pvt. Ltd., Sivakashi	Avtar 50	Avg: 71.9 Max: 79.4 Min: 64.5	Avg: 88.4 Max: 94.6 Min: 83.2
12	Standard Fire works, Sivakashi	AK 57	Avg: 85.6 Max: 90.2 Min: 79.2	Avg: 97.9 Max: 103.2 Min: 89.2

Testing of the crackers at Police Ground, Kolhapur.

Date:- 11.10.2103

Sr .N o.	Name of Company	Brand name of fire cracker	Noise level limit written on the fire cracker	Chemical composition written on the fire cracker	Sound pressure level IMPULS E (Max) in dB(A)	Sound pressure level PEAK(M ax) in dB(C)
Single Crackers					Max. allowable decibel=125	Max. allowable decibel=145
1	G.Pawar and Sons.1243/59 E Rajaram Road,Shivaji Nagar,Kolhapur Udyam	Laxmi Patakha	*	*	116.3	138.9
2	G.Pawar and Sons.1243/59 E Rajaram Road,Shivaji Nagar,Kolhapur. Udyam	Shogun Bomb(Green Sutali)	*	*	122.3	142.9
3	Prakash Fireworks.1237,E-Ward,Bagal Chowk, Kolhapur	Unlabelled big bomb(Green Sutali)	*	*	130.6	152
4	Prakash Fireworks.1237,E-Ward,Bagal Chowk, Kolhapur	Super Bomb(Green Sutali)	*	*	121.5	146
5	Rahul Baburao Mug Near Kolhapur Municipal Corporation,Kolhapur.	Classic Bomb.(Green Sutali)	*	*	120.9	140.5
6	Rahul Baburao Mug Near Kolhapur Municipal Corporation,Kolhapur.	Metro Patakha	*	*	118.2	131.5
7	Rahul Baburao Mug Near Kolhapur Municipal Corporation,Kolhapur	NCLE Patakha	*	*	115.1	129.3
Crackers in Series					Max. allowable decibel=105	Max. allowable decibel=105
08	G.Pawar and Sons.1243/59 E Rajaram Road,Shivaji Udyam	Lavangi Pataka	*	*	107.9	139.1

Noise Standards for Fire-crackers

(The Noise standards for fire-crackers were notified by the Environment (Protection) (Second Amendment) Rules, 1999 vide G.S.R.682(E), dated the 5th October, 1999 and inserted as serial no. 89 of Schedule I of the Environment (Protection) Rules, 1986. Subsequently these Rules were amended by the Environment (Protection) Second Amendment Rules, 2006 vide G.S.R. 640(E), dated the 16th October, 2006, under the Environment (Protection) Act, 1986)

- A. (i) The manufacture, sale or use of fire-crackers generating noise level exceeding 125 dB(A) or 145 dB(C)_{pk} at 4 meters distance from the point of bursting shall be prohibited.
- (ii) For individual fire-cracker constituting the series (joined fire-crackers), the above mentioned limit be reduced by $5 \log_{10}(N)$ dB, where N = number of crackers joined together.
- B. The broad requirements for measurement of noise from fire-crackers shall be-
- (i) The measurements shall be made on a hard concrete surface of minimum 5 meter diameter or equivalent.
- (ii) The measurements shall be made in free field conditions i.e., there shall not be any reflecting surface upto 15 meter distance from the point of bursting.
- (iii) The measurement shall be made with an approved sound level meter.
- C. The Department of Explosives shall ensure implementation of these standards.
- D. The fire-crackers for the purpose of export shall be exempted from the sub-paragraphs A, B and C above, subject to the compliance of the following conditions, namely:-
- (i) the manufacturer shall have an export order;
- (ii) the fire-crackers shall conform to the level prescribed in the country to which it is exported;
- (iii) they shall have a different packing colour code, and