

**2023 LiveLaw (SC) 816**

**IN THE SUPREME COURT OF INDIA  
CIVIL ORIGINAL JURISDICTION**

**A.S. BOPANNA; J., M.M. SUNDRESH; J.**

September 22, 2023

IA NO. 48692 OF 2022 and IA NO. 104836 OF 2023 IN WRIT PETITION (C) NO.728 OF 2015

**Arjun Gopal & Ors. versus Union of India & Ors.**

**Firecracker - The Supreme Court rejected the firecracker makers' plea to use barium and joined crackers – Held, cannot allow barium nitrate in firecrackers merely because the new formulation is 30% less polluting. (Para 12)**

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## **ORDER**

1. Notwithstanding the series of orders passed by this Court regulating the manufacture, sale and bursting firecrackers, one more consideration is ignited by Respondent No.7 - TANFAMA, which is stated to be an association representing a group of manufacturers of firecrackers. They have presently filed an application in I.A. No.104836 of 2023 for directions. Through the said application they seek for grant of permission to allow the usage of reduced quantities of Barium Nitrate with additives in firecrackers as suggested by CSIR – NEERI and approved by PESO and MoEF. Objections have been filed to the said application by the petitioners while Respondent Nos.1 and 6 have filed their affidavits indicating the steps taken by CSIR – NEERI and PESO and in that light, they seek to approve the formulation made, whereby the percentage of particulate matter in emission would be reduced up to 30% and therefore would fit the bill as green firecracker. IA No.48692 of 2022 is filed by another manufacturers Association as an applicant, seeking to manufacture joined firecrackers.

2. In that backdrop we have elaborately heard Mr. Shyam Diwan, learned senior counsel for the Applicant/Respondent No.7, Mr. Gopal Shankarnarayan, learned senior counsel/Amicus Curiae, Ms. Aishwarya Bhati, learned ASG for Respondent Nos.1 and 6, Sri. Gurukrishna Kumar, learned senior counsel and other learned counsel appearing for various other manufacturers and perused the papers, limited to the issue under consideration.

3. The foundation on which the entire case rests is the series of earlier orders passed by this Court at various stages. The earliest of the orders to be noticed is dated 12.09.2017, the directions therein are contained in para 72, up to 72.16 as reported in (2017) 16 SCC 280. In the said order, the composition of the contents was allowed as per the approval of PESO and it was indicated that it will be the responsibility of PESO to ensure compliance with the standards it has formulated.

4. In that view the learned senior counsel for the applicant in an attempt to contend that CSIR – NEERI and PESO have permitted the use of Barium since even in such an

event it will qualify as green cracker with 30% reduction of emission, has at the threshold referred to the steps taken by PESO. The consideration made by this Court with reference to the Minutes of Meeting recorded by PESO as noted in the order dated 05.03.2019, reads as hereunder :-

“Insofar as the issue of manufacture of environment-friendly crackers is concerned, learned counsel appearing for the PESO has produced before us a copy of Minutes of Meeting dated 27.02.2019. It records the minutes of joint work which was undertaken by CSIR – NEERI, standard fireworks and other fireworks manufacturers relating to the formulation and deployment/production of green crackers. Since these minutes are of some significance, we would like to reproduce the same in its entirety in this Order:

“MINUTES OF MEETING

The following joint work was undertaken by CSIR NEERI, standard fireworks and other fireworks manufactures related to formulation and deployment/production of green crackers:

- i. Trial production of following samples was made at Standard Fireworks:
  - a) Conventional formulations (with Barium Nitrate and Potassium Nitrate as oxidizers) of Standard with additives provided by CSIR – NEERI were prepared and fireworks were developed and tested for performance efficiency-improved crackers called as Green fireworks/Green crackers.
  - b) New formulations of standard with additives provided by CSIR – NEERI were prepared and fireworks were developed and tested for performance efficiency-Green fireworks/Green crackers.
  - c) Subsequent to lab scale trials completed by CSIR – NEERI, new formulations of CSIR – NEERI were prepared and fireworks were developed at standards fireworks and tested for performance efficiency – Green fireworks/Green crackers including reduced emission crackers (SWAS, SAFAL, STAR).
- ii. The above samples shall be assessed comparatively for emissions from conventional and reduced emissions crackers/green crackers at CSIR – NEERI.
- iii. Testing of light emitting fireworks including flowerpots, pencils, chakkars, aerial 7 shots, sparklers etc. demonstrated successfully in presence of PESO officers and FW manufacturers (more than 100).
- iv. Testing of sound emitting fireworks including STAR, SWAS, SAFAL and other conventional crackers (bullets, maroons) etc. demonstrated successfully in presence of PESO officers and FW manufacturers (more than 100).
- v. Visits and discussions held with several manufacturers from TANFAMA and TIFMA.
- vi. Apprising of media and press of the purpose of visit.
- vii. Visit and meeting was held with Sony fireworks and Kaliswari for above work to be initiated.
- viii. Procedure initiated for PESO approval by licensed manufacturers (Standards, Sony etc.) with duly signed NDA/MoU with CSIR.
- ix. It was mutually agreed to proceed with submission of product approval documents by FW manufacturers by 7th March, 2019.

- x. It is envisaged that product approval for improved formulation by PESO shall be given by 21st March, 2019.
- xi. It is envisaged that product approval for new formulations shall be given by PESO by 30th April, 2019.
- xii. It is envisaged that bulk production of fireworks (improved formulations) shall be initiated by 30th March, 2019.
- xiii. It is envisaged that bulk production of fireworks (New formulations) shall be initiated by 10th May, 2019.
- xiv. Dialogue was initiated for setting up interim raw materials and compositional analysis emissions facility at Sivakasi with existing infrastructure to meet the demands by July, 2019.
- xv. Joint work to be initiated for assessing emissions from conventional and green crackers of CSIR labs and FW manufacturers to establish relationship between Raw materials, compositional analysis and emissions for different fireworks to illustrate the importance of usage of acceptable quality of raw materials.
- xvi. Nearly 200 MoUs signed with fireworks manufacturers.

After the joint work in various fireworks manufacturing factories situated in and around Sivakasi, and after observation, materials, analysis/assessment of the manufacturing process and testing performance efficiency, it appears that the above-mentioned manufacturing shall reduce the emission of pollutants, PM 2.5 at least by 25-30% (improved and GREEN FIREWORKS/GREEN FIRECRACKERS) and it will be a win-win situation in the interest of all stake holders in the public interest. However, investigations of i(a & b) needs to be included in the report being prepared for definition, composition and emission norms of improved and green crackers.

Many unregulated and distributed manufacturers do not adhere to the quality checks and therefore quality suffers leaving to more pollution. It is desirable that only PESO should be the authorised for any manufacturing of any size. NEERI led system should be used for the testing of quality of raw material for all and a mechanism of barcode or QR code shall be used for all products to avoid any duplicates of Indian or foreign origin.”

It is clear from the above that PESO and NEERI have been able to finalise the improved formulations for manufacture of green crackers, timelines within which the final approval would be given and bulk production would start, were also mentioned therein.

We direct the NEERI and PESO to stick to the aforesaid timelines given in these minutes.

Prima facie, we feel that once these new formulations are developed by the Expert Body of NEERI and PESO which have associated with other experts also, there should not be any problem in manufacturing the green crackers with the aforesaid formulations. However, it is pointed out by the learned counsel that it should be with the condition that no Barium Nitrate or Potassium Nitrate as oxidizers is used.

It is not known as to what are the new formulations developed by the PESO/NEERI. This is the aspect which Experts know better. Needless to mention that the new formulations shall apply to the manufacturers. Be that as it may, the matter shall be listed on 12.03.2019 when all Interlocutory Applications shall also be taken up for hearing.”

5. It is in that context the learned senior counsel seems to contend that the threshold or benchmark suggested by this Court as considered by CSIR – NEERI is satisfied and

such formulation, notwithstanding the presence of Barium has been approved by PESO which will qualify as green firecracker and therefore the manufacture and the sale should be permitted. It is with a view to buttress such contention the documents produced as Annexure - A21 series in the compilation along with short notes and list of dates are relied on. The learned ASG would refer to the affidavit filed on behalf of PESO to indicate the steps taken to approve the formulation and the licensing procedure. The learned Amicus Curiae would however vehemently oppose the move to permit the manufacture of firecrackers containing Barium referring to the serious health hazard it will cause.

6. In the above backdrop, while taking note of all developments, it would be necessary to take note of the minutes of the meeting dated 05.03.2019 held in the office of the CCE, Nagpur. The relevant portion of the consideration recorded therein is as hereunder:-

“In the context of point i(a) of the MOM dated 27/02/2019 vide which it’s mentioned that “Conventional formulation (with Barium Nitrate and Potassium Nitrate as oxidizers) of M/s Standard with additives provided by CSIR-NEERI were prepared and fireworks were developed and tested for performance efficiency- improved crackers called as Green Crackers” it is clarified by NEERI that fireworks made of Barium Nitrate + additives were only used for establishing baseline values for 30% reduction in emission levels. The use of Barium nitrate is not being recommended by NEERI since the same has already been banned by Hon’ble Supreme Court on the basis of recommendation of MOEF & CC.”

7. In that context, it is appropriate to take note of the order dated 11.04.2019 passed in this case by a bench consisting of three Hon’ble Judges wherein a prayer made on behalf of the fireworks manufacturers to permit the manufacture of fireworks with Barium substitute i.e., Barium nitrate was noted. The case put forth that it would reduce pollution to the extent of about 25 to 30 percent was also noted and the Court was of the opinion that it is not inclined to allow at that stage because the matter is still under consideration of PESO which has agreed to look into the best formulation that may be permissible for manufacture of firecrackers. In the very said order, while considering the request for display of fireworks during the festivities of the temple, while permitting, it was made clear that they shall ensure that Barium is not used in the fireworks.

8. It is no doubt true that CSIR - NEERI has subsequent thereto, on 06.12.2019 indicated to PESO about the improved formulation for different variety of firecrackers wherein it is indicated that the said formulation would reduce the PM up to 30 per cent. It is on the said basis the applicant is seeking the relief herein. As noted, though this Court through the order dated 05.03.2019 had indicated that PESO and NEERI are finalising the improved formulations for the manufacture of green crackers and it was observed that there should not be any problem in manufacturing when the expert body approves the same, it cannot be ignored that this Court had also taken note of the contention by the learned counsel for the petitioners that such formulation should be with the condition that no Barium Nitrate or Potassium Nitrate as oxidizers is used. In that backdrop, it is noticed that even though the formulation indicated by CSIR-NEERI to PESO on 06.12.2019 with a reduction of PM up to 30 percent if taken note, the formulation therein comprises of Barium Nitrate. In fact, this Court in its order dated 29.10.2021 while taking into consideration the contentions put forth had taken note that even as on that date the use of Barium salts in the fireworks had continued to be banned.

9. The learned senior counsel for the applicant in justification of the prayer made in the application has sought to contend that Barium Nitrate is an inorganic compound used mainly as an oxidizer and claimed that it is currently used around the world as an oxidizer

as it is the most safe and stable oxidizer. It is contended that no country in the world has banned use of Barium Nitrate in fireworks. Having noted the said contention, we are of the view that the use of the same would depend on the facts and circumstances including the overall environment prevailing in the country or the area. In that background, as rightly pointed out by the learned *Amicus Curiae*, this Court while making a consideration of all aspects through its order dated 23.10.2018 [(2019) 13 SCC 523], in para 34 thereto has taken note of the affidavit filed by a doctor with specific reference to the increase in number of patients during the festival season due to exposure to extremely high level of toxic gases, particulate matter and metallic compounds. It is all these circumstances including the subsisting polluted atmosphere as a whole which had led this Court to pass several orders and also to indicate that the Barium Nitrate shall not be used.

**10.** Though the experts namely the PESO has indicated the reduction of pollution to the extent of 30 per cent, the use of Barium Nitrate as an ingredient is also seen in such formulation. Apart from the fact as to whether there is reduction in the percentage of particulate matter the question that begs an answer is as to whether the existence of the particulate matter in the remaining portion would continue to be a health hazard, more particularly in an area wherein the air quality is already polluted causing respiratory problem is also an aspect which is to be examined by CSIR-NEERI, PESO and MoEF in consultation with the experts in this field. That apart an effort is also required to be made to work out a formulation *dehors* such contents, or for further reduction of PM. This would require continued research.

**11.** In that regard, the affidavits/status reports filed by respondent Nos.1 and 6 respectively if paraphrased, they would shed light on the aspects as the matter has progressed thus far and the improvements that could be made. In fact, in the affidavit dated 30.10.2018 the details of the variety of firecrackers that can be manufactured without using Barium salts have been referred to, which in fact is nearly 50% of the total fireworks production. The details of the variety of firecrackers which cannot be manufactured without using Barium salts are also indicated. Hence the consideration is in respect of those varieties which is indicated as requiring the use of Barium Salts. The affidavit dated 04.08.2023 filed on behalf of Respondent No.1 has annexed to it the earlier status reports wherein the manner in which the consideration has been made by CSIR – NEERI and PESO has been referred to. The affidavit/status reports, in addition to indicating the regulations which are in place has also referred to the continued process adopted in the emission testing of green crackers and also with regard to the raw materials/chemical testing and the affidavit dated 26.10.2020 records as hereunder:

“It is further submitted that periodic review of formulations will be done by the technical committee comprising of PESO/DPIIT, CPCB, CSIR-NEERI, Respondent Ministry and safety experts for identifying new oxidizers and fuels for further minimizing emissions (upto 50-70%) every 6 (Six) months.”

A perusal of the same would indicate that there is scope for further reduction of use of oxidizers which would help further reduce the percentage of particulate matter. It is in that view we are of the opinion that further efforts are necessary rather than being satisfied with what has been achieved thus far. The manufacturers in any event would manufacture the other permissible variety without barium.

**12.** Hence, at this stage allowing the use of Barium Nitrate merely because it is indicated that the formulation as a whole would be 30 per cent less polluting would in fact be a retrograde step as compared to the effort that has been put in by various orders of this Court. Therefore, at this stage, we are of the opinion that the prayer is not liable to be

granted. Further, the same would also apply to the request which was made on behalf of some of the manufacturers to manufacture joined crackers. Hence the prayer in IA No.48692 of 2022 and IA No. 104836 of 2023 cannot be accepted at this stage.

**13.** Having taken note of the above aspects and having concluded as above, though submissions were made by the learned *Amicus Curiae* to consider the prayer made in IA No.119396 of 2017, 24794 of 2020 and IA No.44727 of 2021 and reference was made with regard to the enquiry by CBI indicating the stock of Barium despite being banned and other violations, the same would require detailed consideration and therefore the consideration of the said applications shall stand deferred for the present. In any event, this Court through the order dated 29.10.2021 has already fixed the responsibility and indicated the consequence which can be taken forward.

**14.** For all the above-stated reasons, the prayer in IA No.48692 of 2022 and IA No. 104836 of 2023 and similar prayers stand rejected. The said applications are accordingly disposed of.

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