

**SYSTEM & PROCEDURE FOR COMPLIANCE WITH
NOISE LIMITS FOR PETROL AND KEROSENE
RUN GENERATOR SETS**

Central Pollution Control Board
Delhi

SCOPE

This document lays down the system & procedure for compliance with noise limits for new generator sets run with petrol or kerosene, vide notification G.S.R. 742 (E), at serial no. 91, dated 25th September, 2000, and its amendment vide G.S.R. 628 (E), dated 30th August, 2001, issued by Ministry of Environment and Forests, Government of India. The details are covered as under:

- Part-I : Applicability and requirements (G.S.R. 742(E), dated 25th September, 2000, and its amendment vide G.S.R. 628(E), dated 30th August, 2001)
- Part-II : Certification System & Procedure
- Part-III : Measurement Procedure

ACKNOWLEDGEMENT

Following documents have been referred to for preparation of this document

- i) PCLS/5/2000-2001 (CPCB Document) : System & procedure for compliance to regulations for petrol and kerosene run generator sets upto 19 kW (for emission limits).
- ii) ISO 8528 – 10: 1998 (E) : Reciprocating internal combustion engine driven alternating current generating sets – Part 10: Measurement of airborne noise by the enveloping surface method.

PART I

APPLICABILITY AND REQUIREMENTS

The notification G.S.R. 742(E), dated 25th September, 2000, at serial no. 91, and its amendment vide G.S.R 628(E), dated 30th August, 2001, gives applicability and various requirements of the regulations on noise limits for new generator sets run with petrol or kerosene. The notification is reproduced here as such (with amendment).

Noise Limit for Generator Sets run with Petrol or Kerosene

1. Noise limit

Noise limit for new generator sets run with petrol or kerosene shall be as given below:

	Noise limit from	
	September 1, 2002	September 1, 2003
Sound Power Level L_{WA}	90 dBA	86 dBA

2. Applicability

These rules shall apply to all new generator sets using petrol or kerosene as fuel, manufactured in or imported into India.

Provided that these rules shall not apply to :

- (a) any genset manufactured or imported for the purpose of exports outside India, or
- (b) the genset is intended for the purpose of sample only and not for sale in India.

3. Requirement of certification

Every manufacturer or importer (hereinafter referred to as "supplier") of genset (hereinafter referred to as "product") to which these rules apply must have a valid certificate of type approval for all the product models being manufactured or imported after the specified dates.

4. Verification of conformity of production (COP)

Every supplier shall subject its products to the verification for conformity of production, by certification body specified in clause 8, every year.

5. Sale of generator sets not complying with these rules

The sale of a product model, not having valid type approval certificate, or not complying with the noise limits, as determined by the verification for conformity of production, shall be prohibited, in India.

6. Requirement of conformance labeling

6(1) The supplier of the 'product' must affix a conformance label on the product meeting the following requirements:

- (a) the label shall be durable and legible,
- (b) the label shall be affixed on a part necessary for normal operation of the 'product' and not normally requiring replacement during the 'product' life.

6(2) The conformance label must contain the following information:

- (a) name & address of the supplier (if the address is described in the owners manual, it may not be included in the label),
- (b) statement that "this product conforms to the Environment (Protection) Rules, 1986",
- (c) type approval certificate number and time phase (i.e. September 2002 or September 2003)

7. Nodal agency

- (1) The Central Pollution Control Board shall be the nodal agency for implementation of these rules.
- (2) In case of any dispute or difficulty in implementation of these rules the matter shall be referred to the nodal agency.
- (3) The nodal agency shall constitute a Standing Committee to advise it on all matters; including the disputed matters, related to the implementation of these rules.

8. Certification body

The following agencies are authorised for type approval and for verification of conformity of production.

- (1) Automotive Research Association of India, Pune;
- (2) National Physical Laboratory, New Delhi;
- (3) Naval Science & Technology Laboratory, Visakhapatnam;
- (4) Fluid Control Research Institute, Palghat; and
- (5) National Aerospace Laboratory, Bangalore.

9. Compliance and testing procedure

The compliance and testing procedure shall be prepared and published by Central Pollution Control Board, with the help of the certification agencies.

PART II

CERTIFICATION SYSTEM & PROCEDURE

1.0 MODEL FAMILY

For the purpose of type approval certification and verification of conformity of production, the supplier shall divide their product range into families based on the following parameters:

- i) Dimensions (Length x Width x Height)
- ii) Dry weight
- iii) Anti-vibration mountings
- iv) Fuel tank size
- v) Enclosure details
- vi) 2 stroke / 4 stroke engine
- vii) Forced air cooled / water cooled
- viii) Side valve/over head valve engine
- ix) Fuel (Petrol/Kerosene /Petrol start kerosene run)
- x) Displacement
- xi) Air inlet arrangement
- xii) Exhaust outlet arrangement
- xiii) Single phase / three phase alternator
- xiv) Alternating current / direct current
- xv) Speed of rotation
- xvi) Maximum output
- xvii) Rated output
- xviii) Rated voltage
- xix) Rated current
- xx) Frequency

2.0 APPLICATION FOR TYPE APPROVAL

- 2.1 For each product model, the supplier must submit an application to any of the certification agencies specified in clause 8.0 of the notification G.S.R. 742(E), serial no. 91, dated 25th September, 2000.
- 2.2 The application shall be made in the Performa prescribed in **Annexure I** and must be complete in all respects. Test results, if any, of the noise level test done in accordance with the requirement of this document may also be submitted alongwith the application.

A copy of the forwarding letter, indicating the model, shall be submitted to the nodal agency.

- 2.3 The application must be signed by the authorised representative of the supplier.

3.0 TYPE APPROVAL

- 3.1 Type approval testing shall be carried out for all the product models.
- 3.2 The concerned certification agency shall review the application and indicate, within one month of receipt of the application, plan(schedule) of testing for type approval, with a copy marked to the nodal agency.
- 3.3 The supplier shall submit a product sample for testing, as intimated by the certification agency. A prototype can be submitted, however it must be completely built and conforming to the design to be produced.
- 3.4 The testing shall be done as per the procedure and specifications given in part III of this document.
- 3.5 The product sample/prototype shall be deemed to have passed the test if the sound power level of the model is within the specified limit.

However, if the product sample/prototype fails to complete the test or meet the acceptance criteria, as above, the supplier has the option to repair/ modify or replace the same. If the design modifications reflect changes in the specifications given in the application, a revised application shall be submitted.

If the supplier is unable to repair /modify/replace the product sample/prototype within a reasonable time, the application for certification shall be deemed as withdrawn and a fresh application shall have to be submitted.

- 3.6 After verification/testing for type approval, the certification agency shall submit a type approval report to the supplier indicating acceptance or rejection decision and reasons thereof.
- 3.7 The certification agency shall carry out the type approval testing and give acceptance or rejection decision to the supplier within one month from the date of submission of the sample.

4.0 CERTIFICATE OF TYPE APPROVAL

- 4.1 Subsequent to type approval tests, the certification agency shall issue the certificate of type approval to the supplier for the model as per the format prescribed in **Annexure II**. Copy of the certificate shall also be forwarded to the nodal agency.
- 4.2 The certificate shall be deemed to be valid for the model(s) included therein, unless explicitly withdrawn through a separate written order by the nodal agency.

5.0 VERIFICATION OF CONFORMITY OF PRODUCTION (COP)

- 5.1 Each supplier shall subject its product range to the verification for COP, every year. For this, the year shall mean the period from 1st September of a calendar year to 31st August of the succeeding calendar year.
- 5.2 In case of domestic manufacturer, the verification of COP shall be done as per the following plan.

Total no. of families of the domestic Manufacturer	No. of families to be tested per year
1-2	1
3-4	2
5-6	3
7-8	4
9-10	5
>10	6

- 5.3 In case of importers, the verification of COP shall be done once a year, for each family.
- 5.4 Testing shall be done on samples selected by the certification agency, from production/import units, of one model for each family to be tested as above. The certification agency has the option to select family (ies), model (s) and samples to be tested for COP.
- 5.5 The supplier shall provide the information to the certification agency in the Performa given in **Annexure I**, for models selected for the COP testing.
- 5.6 The supplier shall have the option to select any one of the certification agency, as specified in clause 8.0 of the notification (G.S.R. 742(E), sl. no. 91, dated 25th September 2000) for verification of COP, unless, directed by the Nodal Agency to select a particular certification agency

for verification of COP. The supplier will also have the option to select different certification agency for each COP period.

The supplier shall inform the certification agency and obtain its confirmation at least one month prior to the COP period.

- 5.7 After issuing its confirmation, the certification Agency shall be responsible for verification of COP during the COP period as per the requirements of this document.
- 5.8 The certification agency shall intimate to the manufacturer the schedule for sampling/testing. In case of imports, the importer will confirm to the certification agency the schedule for imports and the certification agency shall intimate the schedule for sampling/testing. The copy of the schedule shall be forwarded to the nodal agency by the certification body.
- 5.9 A minimum quantity of 50 nos. of each model shall be available for random selection. This limit shall be a minimum of 10 units in case of imports.
- 5.10 The testing shall be done as per the procedure and specifications given in part III of this document.
- 5.11 During the testing if a sample fails to complete the test or is found to be defective for reasons other than noise test results, the results of the sample shall be discarded and another sample shall be selected.

6. SAMPLE SIZE & DECISION CRITERIA FOR VERIFICATION OF COP

- 6.1 The number of samples to be tested shall be minimum as necessary to arrive at a decision on whether the production units comply with the noise limits.
- 6.2 A sample is said to have failed if the test result of the sample exceeds the applicable noise limits.
- 6.3 The production/import units of all models in a family shall be deemed to comply with the noise limits if the number of failed samples as defined in 6.2 above, is less than or equal to pass decision no., appropriate to the cumulative no. of samples tested, as given in the table below.

The production/import units of all models in a family shall be deemed to be non-complying with the noise limits if the number of failed samples as defined in 6.2 above, is more than or equal to the fail decision no.,

appropriate to the cumulative no. of samples tested, as given in the table below:

Cumulative Samples	Pass No. (No. of failures)	Fail No. (No. of failures)	Cumulative Samples	Pass No. (No. of failures)	Fail No. (No. of failures)
1	(*)	(**)	16	6	11
2	(*)	(**)	17	7	12
3	(*)	(**)	18	7	12
4	0	(**)	19	8	13
5	0	(**)	20	8	13
6	1	6	21	9	14
7	1	7	22	10	14
8	2	7	23	10	15
9	2	8	24	11	15
10	3	8	25	11	16
11	3	8	26	12	16
12	4	9	27	12	17
13	5	10	28	13	17
14	5	10	29	14	17
15	6	11	30	16	17

(*) : no compliance decision at this stage

(**): no compliance decision at this stage

7.0 VERIFICATION OF COP REPORT

- 7.1 After completion of all tests for verification of COP, the certification agency shall prepare and submit a verification of COP report to the nodal agency giving the families and models selected and the decision. Copy of the report shall also be given to the supplier.

8.0 ANALYSIS & CORRECTIVE ACTIONS FOR NON-COMPLIANCE

- 8.1 If the verification of COP report of the certification agency for a model family indicates non-compliance, the supplier must analyze the reasons for non-compliance, plan and take corrective actions in design, production line and units already produced, if possible, and submit a report to the nodal agency with a copy to the concerned certification agency, within four weeks of the verification of COP report.
- 8.2 If the supplier is unable to diagnose the reasons for non-compliance within stipulated time, this shall be clearly stated in the report.

9.0 CONSEQUENCES OF NON-COMPLIANCE

- 9.1 Based on the diagnosis and corrective action plan submitted by the supplier, the nodal agency may take any of the following actions.
 - 9.1.1 Allow continuation of production/ import/sale of all models in the family if it is satisfied with the corrective actions planned/taken by the supplier with or without additional verification of COP in due course.
 - 9.1.2 Allow continuation of production/import/sale of some or all other models of the family if it determines that the reasons for non-compliance of the tested model are not relevant to these models, with or without additional verification of COP in due course.
 - 9.1.3 Stop production / import/sale of any or all the models in the family till compliance is demonstrated by the supplier, through a re-verification of COP.
- 9.2 The supplier shall be given an opportunity to explain its views before taking a final decision.

PART -III

MEASUREMENT PROCEDURE

1.0 GENERAL

The determination of sound power levels of a product should be done using any of the following test methods by the certification agencies, depending on the facilities available with them.

- i) ISO :8528 (part 10) Reciprocating internal combustion engine driven alternating current generator sets: measurement of airborne noise by the enveloping surface method.
- ii) ISO:3743 Acoustics - Determination of sound power levels of noise sources - Engineering method for small, movable sources in reverberant fields.
- iii) ISO:3744 Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane.
- iv) ISO:3745 Acoustics - Determination of sound power levels of noise sources- precision methods for anechoic and semi-anechoic rooms.

2.0 INSTALLATION AND OPERATION OF PRODUCT UNDER TEST

2.1 For outdoor measurement, the maximum speed of the wind shall not exceed 6 m/s.

2.2 Installation

In case of caster wheel mounted product, supports are required to prevent skidding of the product. In the absence of caster wheel simply placing the product on the reflecting surface should be sufficient.

2.3 **Operation**

The testing should be carried out at following conditions

- rpm - rated rpm
- load - 75% of the rated capacity (Resistive Load)

The load bank shall be a single phase or three phase load circuit (for single phase or three phase genset respectively) consisting of a combination of stable resistive elements of appropriate rating.

3.0 **MEASUREMENT PROCEDURE**

- 3.1 Subject the product to running in, as per the supplier's recommendation. During and after running-in, normal maintenance, as specified by the supplier, shall be carried out.
- 3.2 Run the product and adjust the load, engine speed as required in clause 2.3 of this part.
- 3.3 Run the product for a sufficient period of time (10 minutes).
- 3.4 Take measurements as per the relevant codes.

4.0 **INFORMATION TO BE RECORDED**

Information to be recorded for each test shall be as under:

4.1 **Test type**

Type approval (TA) test or conformity of production (COP) test.

4.2 **Test Code**

Test code followed for carrying out the test

4.3 **Product Details**

- a) - Brief description of the product
- name & address of the supplier
- name & address of the importer
- name & address of the manufacturer
- model name
- brand name
- dimensions (length, width, height in mm)

- fuel tank size
- dry weight in kg
- year of manufacturer
- whether wheel mounted
- details of anti-vibration mountings
- enclosure details

b) **Engine**

- serial no.
- make
- type : 2 stroke/4 stroke
 Forced air cooled/water cooled
 Side valve /over-head valve
- energy source: petrol/kerosene/ petrol start kerosene run
- displacement (cc)
- octane no.
- rpm (at the time of measurement)
- inlet air temperature (at the time of measurement)
- air inlet arrangement
- exhaust outlet arrangement

c) **Alternator**

- serial no.
- make
- type : single phase/three phase
- alternating current/ direct current
- rpm (at the time of measurement)
- power (at the time of measurement)
- voltage (at the time of measurement)
- frequency (at the time of measurement)
- current (at the time of measurement)

d) **Installation details**

4.4 **Acoustic environment**

- a) Description of the test environment, sketch showing the location of the source with respect to surrounding terrain, including a physical description of the test environment.
- b) Environmental correction.
- c) Air temperature, pressure and relative humidity.
- d) Wind speed and direction.

4.5 **Instrumentation**

- a) Instrument used for the measurements, including name, type, serial number and manufacturer.
- b) Method used for checking the calibration of the microphones and other components; the date, place and result of calibration.
- c) Characteristics of windscreen.

4.6 **Acoustical data**

- a) A- weighted sound power level
- b) The measurement radius
- c) The area of measurement surface
- d) The background noise correction (A-weighted)
- e) The environmental corrections (A-weighted)
- f) Sound pressure levels (A- weighted), for the product at each measuring point
- g) Sound pressure levels (A-weighted), for the background noise at each measuring point
- h) The corrected sound pressure level averaged over the measurement surface,
- i) Place, date and time of measurements
- j) Person (s) carrying out the tests

4.7 **Information to be presented in the standing committee**

The results of all the tests should be summarised in the format given in **Annexure III** and presented in the next meeting of the Standing Committee.

APPLICATION FOR TYPE APPROVAL

(INFORMATION TO BE PROVIDED FOR COP TESTING)

- 1.0 NAME AND ADDRESS OF THE SUPPLIER
- 2.0 NAME AND ADDRESS OF THE IMPORTER
- 3.0 NAME AND ADDRESS OF THE GENSET MANUFACTURER
- 4.0 MODEL NAME
- 5.0 BRAND NAME
- 6.0 YEAR OF MANUFACTURE
- 7.0 DIMENSIONS OF THE POWER GENERATOR UNIT

LENGTH.....mm

WIDTHmm

HEIGHTmm

- 8.0 FUEL TANK SIZE
- 9.0 DRY WEIGHTKG
- 10.0 MOUNTING : WHETHER WHEEL MOUNTED
- 11.0 DETAILS OF ANTI-VIBRATION MOUNTINGS
- 12.0 ENCLOSURE DETAILS
- 13.0 ENGINE

- i) SERIAL NO.
- ii) MAKE
- iii) TYPE : 2 STROKE/ 4 STROKE
FORCED AIR COOLED / WATER COOLED
SIDE VALVE /OVER HEAD VALVE
- iv) ENERGY SOURCE : PETROL/KEROSENE /PETROL START
KEROSENE RUN
- v) RATED SPEED OF ROTATION (RPM)
- vi) DISPLACEMENT (cc):
- vii) OCTANE NO.:
- viii) AIR INLET ARRANGEMENT
- ix) EXHAUST OUTLET ARRANGEMENT

14.0 ALTERNATOR

i) SERIAL NO.

ii) MAKE

iii) TYPE : SINGLE PHASE/ THREE PHASE
ALTERNATING CURRENT /DIRECT
CURRENT

iv) RATED SPEED OF ROTATION (RPM)

v) RATED CURRENT (A)

vi) FREQUENCY (Hz)

15.0 STARTING MECHANISM : SELF START / RECOIL STARTER

16.0 ATTACH TRADE LEAFLETS AND MANUALS

Certificate No.:

Dated :

CERTIFICATE OF TYPE APPROVAL

Based on the verification of the documents and/ or tests conducted on the genset model conforming to family designation, manufactured by(and imported by), at(location), it is certified that the model complies with the provisions of the Environment (Protection) Rules, 1986, vide notification no. G.S.R no. 742 (E), at serial no. 91, dated 25th September, 2000, and its amendment vide G.S.R. no. 628(E), dated 30th August, 2001, issued by the Ministry of Environment and Forests, Government of India.

(Head)
Certification Laboratory

(Head)
Certification Agency

ANNEXURE- III

CERTIFICATION AGENCY:

NAME OF THE MANUFACTURER / IMPORTER / SUPPLIER:

S. No	Date of Testing	Brand /Model Name	Type Approval/ COP Test	ISO CODE Adopted	Test Environ-ment	No. of Samples Tested	Engine Specifica-tions	Alternator Specifica-tions	A - Weighted Sound Power Level