

**1.0 PURPOSE :**

To lay down the procedure to check the lead in blood exposure for the employees by doing lead in blood testing.

The Blood lead testing program is part of a comprehensive approach to the prevention of lead-related disease. Blood lead testing is the most reliable method of determining the health and safety of each individual and also provides a failsafe method of monitoring the performance of control systems, hygiene and respirator programs.

A secondary purpose of this program is to screen out individuals who should not be working in a lead plant because either they already have an elevated blood lead level due to:

- (1) Previous occupational exposure
- (2) Previous or ongoing occupational or non-occupational lead exposure
- (3) An unusually high lead Absorption rate
- (4) An unusually low lead Excretion rate

**2.0 SCOPE:**

This procedure is applicable for all NDVC and DVC workers working in production area, lead exposure area more than 30  $\mu\text{g}/\text{m}^3$  for more than 240 hours per year

By way of example these areas currently include: lead handling, lead loading/unloading area, Hazardous waste scrap yard area and housekeeping persons as well as other areas jobs.

This program is not applicable for the visitors & contractors coming for short duration of job like Civil work, service, AMC, erection & commissioning of machines/Equipment's/Systems.

**3.0 RESPONSIBILITY:**

IR, HR, Admin and EHS

**4.0 ACCOUNTABILITY:**

Plant Head

**5.0 DEFINATION:**

**5.1 Lead:** Lead means metallic lead, all inorganic compounds, in form of ingots, lead fumes, lead in powder form, lead in paste form, Excluded from this definition are all other organic lead compounds

**5.2 Permissible exposure limit (PEL):** Any employee is exposed to lead at concentrations greater than 50  $\mu\text{g}/\text{m}^3$  averaged over an 8-hour period.

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**Action Level (AL):** *Action level* means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 µg /m<sup>3</sup>) averaged over an 8-hour period.

- 5.3 Lead poisoning (also known as Plumbism):** It is a type of metal poisoning and a medical condition in humans caused by increased levels of the heavy metal lead in the body. Lead interferes with a variety of body processes and is toxic to many organs and tissues including the heart, bones, intestines, kidneys, and reproductive and nervous systems. It interferes with the development of the nervous system and is therefore particularly toxic to children, causing potentially permanent learning and behavior disorders. Symptoms include abdominal pain, confusion, headache, anemia, irritability, and in severe cases
- 5.4 Zinc protoporphyrin (ZPP):** Zinc protoporphyrin (ZPP) is a compound found in red blood cells when blood production is inhibited by lead and/or by lack of iron. Measurement of zinc protoporphyrin in red cells has been used as a screening test for lead poisoning and for iron deficiency.
- 5.5 High Exposure area:** High exposure area are those working area in which Lead concentration in air is equal to or more than 50 µg/m<sup>3</sup> without use of respirators
- 5.6 Low exposure area:** Low exposure area are those working area in which Lead concentration in air is less than 50 µg/m<sup>3</sup> without use of respirators.
- 5.7 Breathing Zone:** is defined as the zone within a 0.3 meter radius of a worker's nose and mouth. It has been generally assumed that a contaminant in the breathing zone is homogeneous and its concentration is equivalent to the concentration inhaled by the worker
- 5.9 Complete Blood Count (CBC):** It is a blood test used to evaluate your overall health and detect a wide range of disorders, including anemia, infection and leukemia. A complete blood count test measures several components and features of your blood, including: Red blood cells which carry oxygen, White blood cells which fight infection, Hemoglobin the oxygen-carrying protein in red blood cells, Hematocrit the proportion of red blood cells to the fluid component or plasma in your blood, Platelets which help with blood clotting
- 5.10** Abnormal increases or decreases in cell counts as revealed in a complete blood count may indicate that you have an underlying medical condition that calls for further evaluation

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**6.0 PROCEDURE:**

6.1 Medical surveillance program for monitoring Lead in blood includes all NDVC and DVC who are or may be at or the action level for more than 30 days per year exposed to lead as per OSHA 1910.1025(j)(1)(i)

6.2 Medical examination and procedures are performed by the Registered/ licensed physician/lab or other professional only and at reasonable time and place. These examinations and procedures are to take place in lead free areas outside of the lead handling and processing areas. Work clothes and PPE are not permitted in medical examination, treatment or procedure areas except in an emergency

6.3 Medical examination of the employees will be conducted inside the plant premises and if required, employees can be send outside of the factory for required testing.

6.4 Blood sample will be taken to analysis BLL and CBC. Blood lead results are to be reported in units of micrograms per deciliter. ( $\mu\text{g}/\text{dL}$ )

6.5 Pre-employment BLL and CBC shall conduct for all the new hire employees which includes all NDVC and DVC

6.5.1 Blood testing frequency for all the employees shall be twice in a year.

6.5.1.1 If the test result is above  $40 \mu\text{g}/\text{dL}$ , follow up testing is to be done once every 3 months.

5.5.1.2 If the second result is less than  $40 \mu\text{g}/\text{dL}$ , then the individual shall revert to semi-annual blood lead testing

5.5.1.3 If results are  $> 60 \mu\text{g}/\text{dL}$ , the individual shall be retested once every other month (6 times per year) until 2 consecutive test results are less than 40.

5.5.1.4 Each employee who has been removed due to elevated blood lead level is to be retested at least once in three (3) months during the removal period

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- 6.5.2** The employee shall remove from work having an exposure to lead at or above  $60 \mu\text{g/dL}$  or if the employees BLL results of last three consecutive test results indicate  $\text{BLL} \geq 50 \mu\text{g/dL}$  shall remove from the work area.
- 6.5.3** Whenever the results of a blood lead level test indicate that an employee's blood lead level is at or above  $60 \mu\text{g/dL}$  it shall provide a second (follow-up) blood sampling test within **two weeks** after receiving the results of the first blood sampling test
- 6.5.3.1** After retest follow up of the employee who has been removed due to value equal or above  $60 \mu\text{g/dL}$  shall be retested at least once **in three month** during the removal period of employee removed due to lead exposure.
- 6.5.4** Medical examination and counseling is to be done at least once in three month for each employee whose blood lead level results are at or above  $40 \mu\text{g/dL}$
- 6.5.5** Employee shall not be removed if the last blood sampling test indicates a blood lead level  $>40\mu\text{g} < 60\mu\text{g/dL}$ .
- 6.5.5.1** Employee shall remain under health and hygiene observations & Counseling if the last blood sampling test indicates a blood lead level  $>40\mu\text{g} < 60\mu\text{g/dL}$ .
- 7.0 Counseling:** Company may hired Doctor, CSR team & any other specialist for these counseling's. The retraining shall include an initial and semi-monthly follow up meeting to:
1. Review proper work procedures
  2. Review proper PPE use and practices
  3. Review of personal hygiene practices
  4. Review of opportunities for improvement in each of the above areas.
  5. Discussion of any possible exposures to lead outside work.
  6. Counseling and education on proper nutrition.
  7. Observation of the individual's work and hygiene habits and practices.

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- 8.0 Employee shall continue to wear a respirator at all the times and shall be required to take shower and change the soiled dangry at the end of each work shift as long as he/she working in HE area.
- 8.1 Employee shall be reassigned to a working area where the airborne lead level is below the  $50 \mu\text{g}/\text{m}^3$ . Within 2 weeks of the reassignment of a medically removed worker they shall have a personal air sample taken with them doing the new job to confirm their exposure is below the Action Level ( $50 \mu\text{g}/\text{m}^3$ ).
- 9.0 **Blood level test frequency table:** Below table indicates LIB testing frequency with action.

Sr no	Value	Action and Frequency of test
1	$\geq 40 < 60$	Assigned to the Health and Hygiene, counselling & retraining Program
2	$< 40 \mu\text{g}/\text{dL}$	After six month
3	$\geq 40 < 60$	a) Retest of employee <u>after 3 months</u> till last two consecutive BLL results $< 40 \mu\text{g}/\text{dL}$ . b) After getting BLL result $< 40$ , BLL test of employee will conduct after 6 month.
4	$\geq 60 \mu\text{g}/\text{dL}$	Retest after receiving the reports <u>within 2 weeks</u> for confirmation <b>After receiving retest results:</b> <b>Case 1: BLL <math>\geq 40 &lt; 60 \mu\text{g}/\text{dL}</math></b> a) Retest employee after 3 months till last two consecutive BLL results $< 40 \mu\text{g}/\text{dL}$ . b) After getting BLL result $< 40$ , BLL test of each employee will conduct after 6 month. <b>Case 2: BLL <math>\geq 60 \mu\text{g}/\text{dL}</math> -</b> a) Relocate employee immediately till last two consecutive results come below $40 \mu\text{g}/\text{dL}$ . b) Retest employee after 2 months till two consecutive test results shall come $< 40 \mu\text{g}/\text{dL}$ d) After getting BLL result $< 40$ , BLL test will conduct of each employee after 6 month

- Note:** 1. Pre-employment BLL and CBC test shall conduct for all new hiring's before his/her joining  
If candidate BLL value  $\geq 30 \mu\text{g}/\text{dL}$  during Pre-employment test, he/she shall not be hire.  
2. For temporary employees BLL Test shall be done after 3 month of joining

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Joining  $\rightarrow$  After 3 months up to 6 month

**10.0 RACI MATRIX:**

<b>Activities</b>	<b>Responsibility</b>	<b>Accountability</b>	<b>Consult</b>	<b>Inform</b>
Pre-Employment BLL testing	HR/IR	HR Head	EHS	HR head , EHS head, Plant head
Periodical Lead in blood testing	ADMIN/IR/EHS	Plant Head	EHS /Admin/IR	EHS head ,Plant head , HR and Admin head
Follow up BLL testing for exceeding the limits	ADMIN/IR/EHS	Plant Head	EHS /Admin/IR	EHS head ,Plant head , HR and Admin head

**11.0 Abbreviation:**

AL	- Action level
PEL	- Permissible exposure limit
HE	- High exposure
LE	- Low exposure
BLL	- Blood lead level
CBC	- Complete blood count
NDVC	- Non Direct variable cost
DVC	- Direct Variable cost

**12.0 Reference : OSHA 1910.1025**

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