

# LAYING OF MDPE NETWORK AND GI/Cu INSTALLATION WORK FOR DOMESTIC, COMMERCIAL AND INDUSTRIAL CUSTOMERS FOR CUGL GA'S IN KANPUR, UNNAO, AND BAREILLY IN THE STATE OF UTTAR PRADESH

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**CENTRAL UP GAS LIMITED (CUGL)**  
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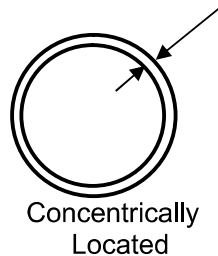
## **1.0 ELECTRO FUSION FOR PE PIPE**

### **1.1 Electro Fusion Fitting Jointing**

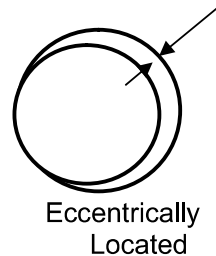
1.1.1 For electro fusion fitting jointing, an electrical resistance element is incorporated in the socket of the fitting which, when connected to an appropriate power supply, melts and fuses the materials of the pipe and fitting together.

1.1.2 The effectiveness of this technique depends on attention to the preparation of the jointing surfaces, in particular the removal of the oxidized surface of the pipe over the socket depth and ensuring the jointing surfaces area clean. Also, the pipe should be checked for ovality. If ovality causes a gap between concentrically located pipe and the fitting to exceed 1% of the pipe OD, the pipe must be re-rounded to ensure correct welding. If the gap still exceeds 1% of the pipe OD after re-rounding, then a check should be made of the pipe OD dimensions to determine if it meets specification.

Max gap 1% of pipe OD



Max gap 2% of pipe OD



1.1.3 The maximum gap between eccentrically located pipe and fitting i.e. Pipe touching fitting at one point, must not exceed 2% of the pipe OD.

1.1.4 Sometimes coiled pipes may be too oval to fit into couplers, or the end of the pipe may make the alignment of the ends impossible. In such circumstances the use of a mechanical pipe straightener or rounding tool is necessary.

1.1.5 The equipment and procedures following relate to fittings with center stops. If fittings without center stops are used, the maximum insertion depth must be clearly marked on the pipe ends prior to jointing (felt tip pen).

### **Equipment**

- a. The control box input supply is to be from a nominal 240V generator, which is normally of approximately 5kVA capacity. The nominal output of the generator is to be 240V + 15%, - 10% between no load and full load. Control boxes are to include safety devices to prevent excessive voltages being present at the control box output. The safety device shall operate in less than 0.5 s.

**Note that extension leads are not to be used on the control box outlet connections.**

**WARNING:** Control boxes are not intrinsically safe and must therefore not be taken into the trench.

- b. A mechanical pipe surface preparation tool is to be used before fusion is attempted. The tool is to be capable of removing the oxidized surface of the pipe in excess of the insertion depth. The tool is to remove a layer of surface material 0.2 – 0.4 mm thick from the outer surface of the pipe preferably in a continuous strip of swarf over that length and round of the pipe.
- c. Pipe clamps for restraining, aligning and re-rounding the pipes in the fusion process are to be used.
- d. Pipe cutters with saw and saw guide.
- e. Protection against adverse weather conditions.

### **1.2 Electro Fusion Jointing Method / Procedure**

Preparation

- a. Ensure there is sufficient space to permit access to the jointing area. In a trench, a minimum clearance of 150 mm is required.
- b. Check that the pipe ends to be jointed are cut square to the axis of the pipe and any burrs removed.
- c. Wipe pipe ends using clean lint-free material to remove traces of dirt or mud, etc...
- d. Mark the area over which the oxidized pipe surface is to be removed, i.e. In excess of the insertion depth, on each pipe to be jointed by placing the socket of the bagged fitting along side the pipe end. Trace a line round the circumference at the appropriate distance from the end of the pipe using a felt tip pen or similar.

**Note that the fitting should not be removed from the packaging at this stage.**

- e. Connect the electro fusion control box input leads to the generator.
- f. Check that the reset stop button, if fitted on the control box, is in the correct mode.
- g. Using the pipe end preparation tool, remove the entire surface of the pipe uniformly, preferably in continuous swarf over the area identified, i.e. In excess of the insertion depth.

A mechanical scraper could be used; however, there is a considerable risk that the end preparation will not be adequate with the use of such a tool.

**Note that the prepared pipe surface should not be touched by hand.**

- h. Remove the fitting from its packing and clean the scraped area of the pipe surface and the bore of the fitting with a disposable wipe impregnated with Iso-propanol / Acetone. Ensure the prepared surfaces are completely dry before proceeding.

**Note that while Iso-propanol is a suitable cleaner, its use is subject to local Health and Safety Regulations.**

- i. Check that the pipe clamps are of the correct size for the pipes to be jointed.
- j. Insert the pipe ends into the fitting so that they are in contact with the center stop.
- k. Using the pipe clamps, secure the pipes so that they cannot move during the fusion cycle. Check that the pipe ends and the fitting are correctly aligned.
- l. Check that there is sufficient fuel for the generator to finish the joint. Start the generator and check that it is functioning correctly.
- m. Switch on the control box.
- n. Connect the control box output leads to the fitting terminals and check that they have been fully inserted.

If required by the control box enter the fusion jointing time into the control box timer. The jointing time is indicated on the fitting. Check the correct time is shown on the control box display.

**Note 1:** Automatic control boxes are available which obviate the need to enter the fusion time.

**Note 2:** Gloves and goggles should be worn during the Fusion process.

- o. Press the start button on the control box and check that the heating cycle is proceeding as indicated on the display.

- p. On completion of the heating cycle, the melt indicators should have risen. If there is no apparent move in the melt indicators, the joint should be cut out and a fresh joint made (See note 3 below).
- q. If a satisfactory joint has been made, the joint is to be left in the clamps for the cooling time specified on the fitting or the automatic control box.

**Note 3:** If the fusion cycle terminates before completion of the countdown, check for faults as indicated by the control box warning lights and check that there is adequate fuel in the generator. DO NOT attempt a second fusion cycle within one hour / cooling of joint at Ambient Temperature of the first attempt.

### 1.3 Records

Records of appropriate servicing and calibration shall be kept.

### 1.4 Training

It is necessary that operators, inspection and supervisory personnel acquire the skills of electro fusion fitting fusion. The necessary training should be carried out by a qualified instructor with the objective of enabling participants to.

- ❖ Understand the principles of electro fusion fitting jointing.
- ❖ Identify pipe and appropriate fitting markings.
- ❖ Carry out pre-jointing machine and equipment checks.
- ❖ Make satisfactory electro fusion fitting joints from pipes and fittings of different sizes.
- ❖ Inspect for and identify joints of acceptable quality.

**Note that some form of assessment and certification should be associated with the training. The certificate should detail the pipe and fitting size range. And the equipment used. A register of successful participants should be kept.**

### 1.5 Electro Fusion Saddle Jointing

- a. With electro fusion saddle jointing, an electrical resistance element is incorporated in the base of the saddle which, when connected to the appropriate power supply, melts and fuses the material of the fitting and the pipe together.
- b. The success of the technique depends on effective preparation of the jointing surfaces, in particular the removal of the oxidized surface of the pipe over the area equivalent to the area of the saddle base, and cleaning of the pipe surfaces.
- c. Methods of holding the tapping tee saddle during the fusion cycle are used namely, top loading and under clamping. The general parameters are similar. In some cases, if the manufacturer's procedure for holding the fitting is provided, then the same should be followed during the fusion cycle.

### 1.6 Electro Fusion Saddle Jointing Method / Procedure

#### Preparation

- a. Expose the pipe onto which the tapping tee is to be assembled, ensuring there is sufficient clear space around the pipe. In a trench, a minimum clearance of 150 mm is required.
- b. Clean the pipe over the general area on which the saddle is to be assembled using clean, disposable lint-free material.

- c. Without removing the fitting from its packaging, place it over the required position on the main. Mark the pipe surface all around and clear of the saddle base area using a felt tip pen or similar.
- d. Remove the surface of the pipe to a depth of 0.2 to 0.4 mm over the full area marked using a suitable tool. Remove the swarf.
- e. Connect the electro fusion control box input leads to the generator.
- f. Check that the reset stop button, if fitted on the control box, is in the correct mode.
- g. Remove the two halves of fitting from its packing and clean the scraped area of the pipe surface and the bore of the fitting with a disposable wipe impregnated with Iso-propanol / Acetone. Ensure the prepared surfaces are completely dry before proceeding.

**Note again that while Iso-propanol is a suitable cleaner, its use is subject to local Health and Safety Regulations.**

- h. Position the fitting base onto the prepared pipe surface, and bring the lower saddle into position then gradually and evenly tighten the nuts until the upper saddle makes firm contact with the scraped pipe.
- i. Check that there is sufficient fuel for the generator to complete the joint. Start the generator and check that it is functioning correctly.
- j. Switch on the control box if applicable.
- k. Connect the control box output leads to the fitting terminals and check that they have been fully inserted.
- l. If required by the control box, enter the fusion jointing time into the control box timer. The jointing time is indicated on the fitting. Check the correct time is shown on the control box display.

**Note 1:** Automatic control boxes are available which obviate the need to enter the fusion time.

**Note 2:** Gloves and goggles should be worn during the jointing process.

- m. Press the start button on the control box and check that the heating cycle is proceeding as indicated on the display.
- n. On completion of the heating cycle, the melt indicators, where incorporated should have risen. If there is no apparent move in the melt indicators, a new saddle joint should be made. Cut the tee of the faulty joint from its base.
- o. If a satisfactory joint has been made, the joint is to be left in the clamps for the cooling time specified on the fitting label or by the automatic control box.

**Note 3:** If the fusion cycle terminates before completion of the countdown, check for faults as indicated by the control box warning lights and check that there is adequate fuel in the generator. DO NOT attempt a second fusion cycle within one hour of the first attempt.

**Note 4:** The connection of the service pipe to the fitting outlet should be carried out in accordance with the procedure of the appropriate section of this Item.

**Note 5:** DO NOT attempt to tap the main with the integral cutter for at least 10 minutes after completion of the cooling cycle.

## 1.7

### Records

Records of appropriate servicing and calibration of Electro Fusion machines/ joints shall be kept.



## 1.8 Training

AS PER 1.6

Note that some form of assessment and certification should be associated with the training. The certificate should detail the pipe and fitting size range and the equipment used. A register of successful participants should be kept.

## 1.9 Stopping the gas flow

In the operation of a distribution system there is a periodic need to stop the gas flow for either routine or emergency maintenance. The flow may be stopped through the use of installed fittings such as valves. Where installed fittings are not available or the use of such would cause significant supply disruption, then one of the following methods may be employed.

### 1.10 Squeeze-off

- a. To control the gas, flow a special tool may be used to squeeze the pipe walls together. Hydraulic jacks are used to supply the necessary force to compress the pipe walls for sizes 90 mm and above.
- b. As will be seen the squeeze-off equipment comprises two bars to apply pressure to the outside of the pipe. The bars are brought together, either manually or hydraulically, squeezing the pipe material together until a seal is formed where the upper and lower walls meet.
- c. The hydraulic machines should have a spring return for the jack and locking to prevent accidental release of pressure during operation. All squeeze-off machines should be fitted with check plate or stops to avoid over compression of the pipe.
- d. Where the pipe walls are compressed the polyethylene pipe will be severely deformed in the regions of maximum compression. The pipe will eventually regain its original shape after squeezing but there will be some reduction in the pressure bearing properties.
- e. A complete stop may not always be obtainable because of wrinkling of the inside of the pipe. If a complete stop is required then a second squeeze can be used, with an intermediate vent to remove the gas which passes the first squeeze from say the trench area. A second squeeze-off procedure should be a minimum of three pipe diameters and right angles to the initial squeeze.
- f. While not essential it would be good practice to fit a reinforcing stainless-steel band / do not squeeze again adhesive tape around the pipe upon the completion of a squeezing operation.

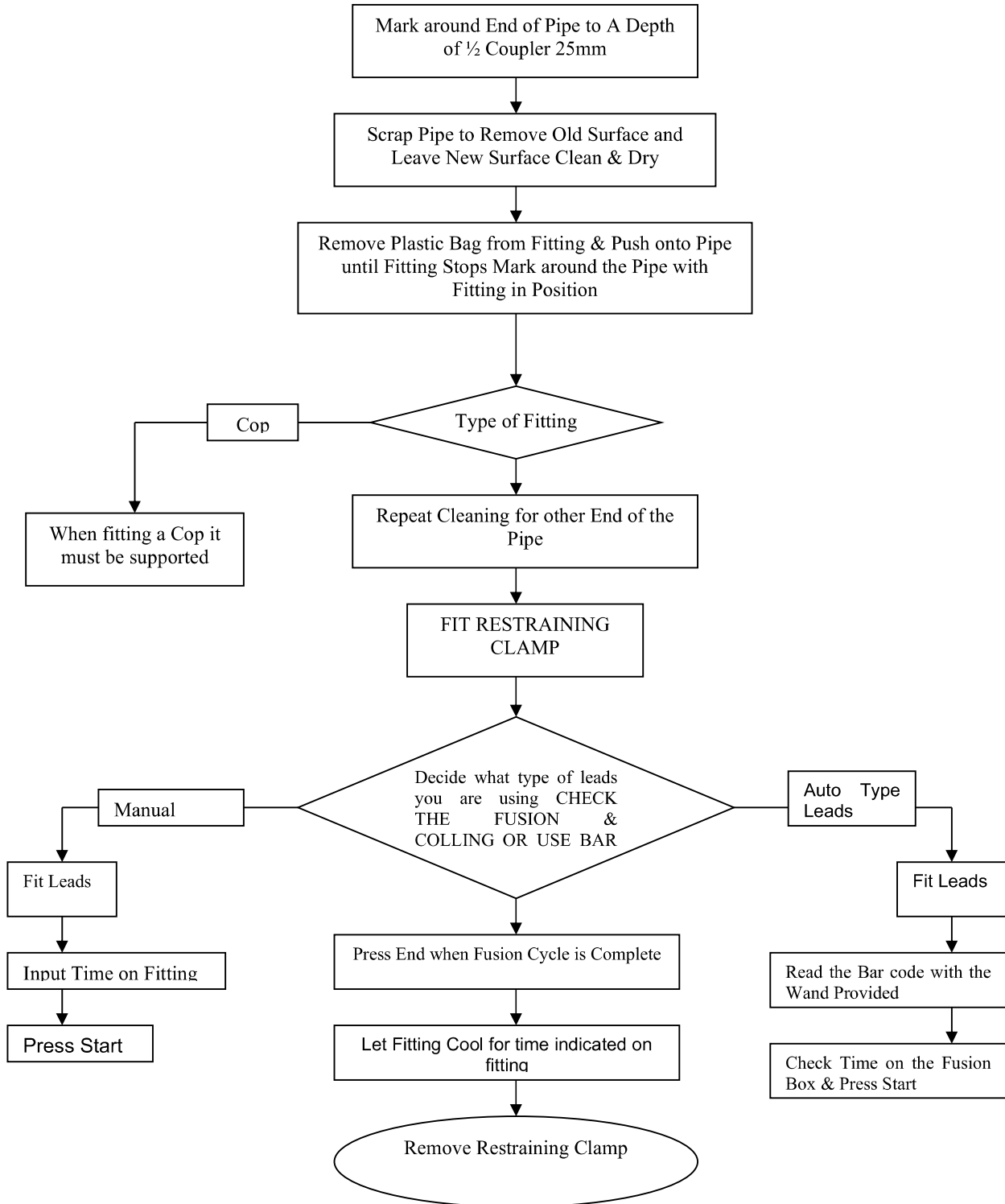
### 1.11 Bending-Back

Bending back of the pipe may be performed where the pipe has been severely damaged and stopping the gas flow is imperative. Its application is of a temporary nature and will provide relief until a permanent repair can be effected. The section of pipe, which has been bent back, will have to be replaced because of the damage caused by the severity of the bend back operation. The need for any bend back operation is most likely to occur as a consequence of damage caused to a PE service pipe.

While it is not the prime function of a saddle tee, controlling the flow in a service may be achieved by opening up on an installed saddle tee and winding down the internal tapping tool to shut off the flow into the service pipe.

**ATTACHMENT # 1**

**FUSION COUPLERS FROM 20MM TO 180MM**



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## CENTRAL U.P. GAS LIMITED (CUGL)

### LAYING OF MDPE NETWORK AND GI / Cu INSTALLATION WORK ALONG WITH REGISTRATION OF DOMESTIC CUSTOMERS" FOR CUGL IN KANPUR, UNNAO & BAREILLY GA IN U.P GA

PTS – HEALTH, SAFETY & ENVIRONMENT

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 	 <b>CUGL</b> <small>Central U.P. Gas Limited</small>	<b>PTS - HEALTH, SAFETY &amp; ENVIRONMENT</b>	<b>P.014714 G 11031 044</b>
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## 1.0 SCOPE

This specification establishes the Health, safety and Environment (HSE) aspects to be complied with by the contractor during construction at site.

## 2.0 REFERENCES

This document should be read in conjunction with following.

- General Condition of Contract (GCC)
- Special Condition of Contract (SCC)
- Job Specifications
- Relevant IS codes
- Reporting Formats

## 3.0 RESPONSIBILITY & ORGANISATION

Safety activities at site shall be under control of contractor's RCM. He shall be responsible for implementation of HSE provisions. The nominated or designated safety engineer/ officer shall assist and perform day to day HSE work as per his advice.

## 4.0 GENERAL REQUIREMENT

- 4.1. The contractor should follow HSE policy of owner as applicable to construction site.
- 4.2. The contractor shall deploy a full time HSE engineer / officer to coordinate the site.  
The HSE officer shall be duly qualified in Industrial Health & Safety management with an experience of 4-5 years.
- 4.3. The contractor shall ensure that HSE requirements are clearly understood & faithfully implemented at all level, at each site.
- 4.4. The contractor shall organize safety awareness programs regularly.
- 4.5. The contractor shall ensure his participation in the every HSE meeting called by owner/owner representative.
- 4.6. The contractors shall conduct daily toolbox talk.
- 4.7. The contractor shall submit Monthly HSE reports (Form attached in ANNEXURES).
- 4.8. The contractor shall provide all help and support to the injured person got injury at site during construction work and arrange compensation as per insurance policy / Act.
- 4.9. The contractor shall adhere consistently to all provisions of HSE. In case of non-compliance or continuous failure the owner/ owner representative may impose stoppage of work without any cost time implication to owner. A penalty amount of Rs 1000/- shall be imposed on the contractor for the serious HSE violation.
- 4.10. Three times of this penalty may count as a serious violation of contractor in line with HSE. This may affect to new work assignment/award of contractor.

## 5.0 ACCIDENT, INCIDENT AND NEAR-MISS REPORTING

### Accident

Unintended occurrence arising out of and in the course of employment of a person, which results in to injury with or without damage to plant/equipment/materials.

### Incident

means an unplanned and uncontrolled event which results in damage to plant or equipment or loss of material without causing any injury to persons, like fire, spill, leak, property damage etc.

**Near-miss**

An unexpected, unwanted event not causing loss, injury or illness but which under slightly altered conditions can lead to an accident.

can be defined as “Any event which under slightly unfavorable circumstances, may have resulted in any of the following:

- Injury, fatal or otherwise or ill health to people
- Loss of property, damage to plant or materials
- Damage to the environment
- A business interruption”

Accident, Incident and Near miss reporting form listed in ANNEXURES

**6.0 HSE REQUIREMENTS AT SITE****6.1 Personnel Protective Equipments**

The contractors shall provide sufficient numbers of following personal protective equipment's (PPEs) to workmen and supervisors/engineers to use them properly at work site.

Following five numbers of Personnel protective equipments are identified as MANDATORY for all.

- Safety Helmet
  - Coverall
  - Safety shoes/footwear
  - Safety Glasses
  - Hand Gloves (as per job requirement)
- Other PPEs are depending upon nature of job like
- Arc Welding – Welding face shield
  - Grinding – Grinding face shield
  - Height work – Full Body harness (above 2 meters)

Ask site supervisor for proper use and selection of protective clothing / equipment for specialised jobs

**6.2 Welding**

- Ensure that welding machine is in order and approved by site engineer.
- Ensure that welding cables are in order.
- Ensure that welding machine is properly earthed.
- Remove all combustible material from welding area to avoid fire
- Place a fire extinguisher near by welding premises.
- Ensure welding holder, cable and its lugs in good condition and use only industrial power socket and plugs (3 Pin) to avoid electricity risk.
- Make sure that welding machine is provided with ON/OFF switch and is earthed/grounding.
- Do not overload electrical appliances and cable, Shocked pin etc,
- Ground the work piece separately from the welding return connection only.

**6.3 Gas Cutting**

- Check the cylinder and its valve or leakage and move out any leaking cylinder immediately.
- Ensure that flash back arresters are installed with torch and NRV (Non return valve) on the gas cylinders side.
- Ensure cylinders in vertical position (Cylinder trolley) and far away from fall of sparks and hot metal.
- Check the regulator and torches that they are inspected prior to every use.
- Check for leaks around regulators, hoses/fittings & nozzle with soap solution.
- Check the entire hose length if it is cracked or worn out cut that length of hose or replace the hose.
- Check that flash back arrester used for the purpose is of approved make/specification only.
- Place a fire extinguisher near by welding premises.

**6.4 Grinding Operation**

- Grinding wheels should be stored in dry place.
- After expiry date, grinding wheel must be condemned, broken into pieces.
- Power supply cable of adequate current carrying capacity shall be used and it should be in good workable condition without abrasions, cuts or puncture in outer insulation.
- Socket pin provided at supply end and on/off switch in working condition.
- Proper earthing of the body in case of metallic body.
- Wheel guard properly fitted in position.
- Machine body without any damage like crack etc.
- Moving part (wheel) must be properly fixed to the machine with the help of spanner.
- Grinding wheel must be of suitable size as per the speed of grinding machine.
- Grinding wheel without manufacturer's sticker showing size, speed and expiry date must be condemned.
- Don't use portable grinding machine as bench grinder.
- Don't fit over size wheel than recommended size by machine/wheel manufacturer.
- Don't grind small, unstable object without fixing it in the vice.
- Don't over press the grinding wheel against the job for fast removal of metal.
- Put OFF the main switch, while machine is not in use (tea break etc.)
- Don't chip off grinding/cutting wheel for achieving fast cutting rate.

**PPEs:**

- Use of helmet, face shield or safety goggles (where face shield is not possible.) and hand gloves.

**6.5 Use of Power Tools and Cables**

- All electrical equipment and tools used by the contractors and their employees shall be properly checked by contractor's supervisor before use.
- All power tools must have proper guard at all time.
- Leads /cables must be placed so that they do not create a tripping hazard.

## 6.6 Material Handling and Storage

The Contractor will only use crane/Hydra and lifting equipment that has been tested and certified as fit for purpose by 3<sup>rd</sup> Party. All crane operators and riggers will be adequately trained and certified. The Contractor will keep records of tests and certification of all lifting equipment crane employed on the Works.

Maintenance records shall be routinely inspected by the Contractor and made available for Safety audits.

**LIFTING GEAR:** Lifting machine, chains, ropes and lifting tackles used at site shall conform to the following:

- All parts shall be good construction, sound material and adequate strength and free from defects.
- Shall be properly maintained, thoroughly examined, load tested by competent person.
- No lifting machine and no chain, rope or lifting tackle shall except for purpose of test be loaded beyond safe working load and this safe working load must be plainly marked on the gear concerned.
- All material must be properly stacked and secured to prevent sliding, falling or collapse.
- Stairs and passageways must be kept clear at all time.

## 6.7 Trenches and Excavation

Before commencing any excavation work the Site in charge will ensure that the proposed works have been adequately assessed and planned to ensure that they are executed safely and without risks to Health and safety. The factors to be assessed and planned will include: -

- The nature and stability of the material being excavated and the need for any support of walls.
- The effect of excavation on nearby area.
- The foreseeable presence of hazardous contaminants.
- The proximity of mobile plant.
- The provision of edge protection (fall prevention of people and materials)
- Access and egress

## 6.8 Pipe Transportation and lowering

- All drivers shall hold a valid driving license for the class of vehicle.
- Securing of the load shall be according to established and approved methods.
- All overhangs shall be made clearly visible and restricted to acceptable limits.
- Load shall be checked before moving off and after traveling a suitable distance.
- All vehicles used by Contractors shall be in worthy condition and in conformance to the Land Transport requirement.
- Use of certified side booms after 3<sup>rd</sup> Party inspection.
- Effective communication should be done among all involved personals.
- Signaling shall be done by authorized foreman only.
- Ensure appropriate measures are taken for overhead hazards.
- Persons are not allowed towards trench side / under the boom at the time of lowering.
- Co-ordination of lowering in by a single man only.
- Inspection of equipment before use.
- All personnel should stay clear of moving equipment.



- Use of certified lifting tools and tackles.

## 6.9 Pressure / Leak Testing

### Hydraulic and Pneumatic Test

Access to the test area shall be limited to essential personnel only before the test commences compliance is required with the following points:

- Persons supervising pressure or leak tests must have sufficient knowledge and experience of testing to fully understand the hazards of the activity and the precaution, which must be taken.
- Effective communication, including formal procedures, must be established between sites whenever the test envelope extends beyond one site, for example, pipelines.
- The area shall be cordoned off (using tape, shields or barriers, etc) at an adequate distance from the equipment to be tested, as specified on the Permit to Work
- Warning signs shall be posted at access ways, at other strategic positions, and on the equipment to be tested (including the doors of test workshops or other designated areas)
- Pressuring equipment shall be provided with suitably calibrated pressure control / regulator devices.
- Pressuring equipment shall not be left unattended at any time during the test.
- Pressuring equipment shall be isolated from the equipment under test and where practicable disconnected, when the test pressure has been reached.
- Care must be taken to ensure that materials of construction have the required ductility at the test temperature to prevent brittle fracture.
- A safety valve should be fitted to the equipment/system being tested, set to relieve at a pressure that will prevent over pressurization
- Sufficient venting / draining points shall be provided in order to prevent trapping of pressurizing medium behind non-return valves, check valves, between isolation valves, or within dead legs of the pressure envelope
- The equipment/plant to be pressure tested must be subjected to thorough examination prior to testing. It may be necessary to 100% inspect all welds using visual, radiographic or other NDT techniques
- The gas supply must be isolated when test pressure has been achieved
- The pressure envelope must contain sufficient vents, to a safe location.
- De-pressurization after pneumatic testing must be gradual

## 6.10 Scaffolding and Ladder

- All working platform must be constructed with the specific requirement of job.
- All portable ladders must be in good condition as per the site norms.
- If the working platform is not permanent, then safety belt must be used.
- There shall be firm foundation for all scaffoldings. All scaffolding shall be made of sound material.
- Scaffolding material shall be inspected and used, only if found in good condition.
- Provide metal base plate is used under all upright or standard scaffoldings. Correct type of couplers shall be used for all connections.
- Plumb and level scaffoldings as erection proceeds, so that braces will fit without forcing. Fasten all braces securely.

- Working platforms shall be provided with guards. This should consist of top rail, mid rail, and toe board. The toe board shall be of minimum height 100 mm, while the mid rail and top rail shall be at heights of 600 mm and 1200 mm respectively.
- Do not use ladders or makeshift devices on top of scaffoldings to increase the height.
- Shall be placed at least 75 deg. to the floor.
- Ladder shall extend 3' to 4' above the point of Landing and topmost 3 rungs shall not be used.
- Ladder is checked visually for defects before every use.
- Ladders shall not be used in a horizontal position as runways or scaffoldings.
- Ladders shall not be placed in front of a door that opens toward the ladder unless the door is locked, blocked or guarded.
- Fall arrestor to be used wherever applicable.

#### 6.11 Work Permit Procedure

- For working at more than 10' height the permission must be obtained from site in-charge.
- For doing any Hot work in the fire risk areas the permission must be obtained from site in charge or safety officer.
- For any Excavation work it must be ensured that there are no underground utilities like cables, Water pipeline etc.
- For any work inside confined space, entry permit must be obtained from site engineer.

#### 6.12 Barricades and Warning Signs

- Area where work is being carried out above man height or below 1' ground depth must be barricaded.
- Follow the instruction of all types of warning signs like "NO SMOKING" "NO ENTRY" "DANGER" "Work at height"

#### 6.13 Emergency Plan and Procedures

- All Contractor's employees should be aware of site Emergency control plan
- Periodic drill to train employees for their awareness & information should be followed.

#### 6.14 Road Safety Norms

- For roadside working site to be barricaded as per approved barricading norms given in drg. No. 7452-L-15-0107. Penalty clause for road safety & barricading shall be applicable as per relevant clause of commercial part of tender.
- Only eligible driver can drive required vehicle inside site
- Speed limit norms of site must be followed
- No riding or travelling on the back of open-end vehicle, fork lift or trailers should be done.

#### 6.15 Labour Welfare & Legal Requirement

- All mandatory provisions with regard to safety as prescribed under contract Labour (Abolition & Regulation) Act 1970 and Rules made there under are applicable.
- Workmen compensation insurance and registration under ESI should be maintained.
- Time to time, all rules and regulations suggested by safety committee of site must be followed and implemented.

## ANNEXURES

### ANNEXURE – A

#### RELEVANT IS-CODES FOR PERSONNEL PROTECTION

IS : 2925 – 1984	:	Industrial Safety Helmets.
IS : 4770 – 1968	:	Rubber gloves for electrical purposes
IS : 6994 – 1973 (Part – I)	:	Industrial Safety Gloves (Leather & Cotton)
IS : 1989 – 1986 (Part – I & III)	:	Leather safety boots and shoes
IS : 3738 – 1975	:	Rubber knee boots
IS : 5557 – 1969	:	Industrial and Safety rubber knee boots
IS : 6519 – 1971	:	Code of practice for selection, care and repair of Safety footwear
IS : 11226 – 1985	:	Leather Safety footwear having direct moulding sole
IS : 5983 – 1978	:	Eye protectors
IS : 9167 – 1979	:	Ear protectors.
IS : 3521 – 1983	:	Industrial Safety belts and harness

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ANNEXURES

ANNEXURE – B

FORMAT - 1.0

1.0: HEALTHY, SAFETY & ENVIRONMENT (HSE) PLAN

Project : -----

Contractor:-----

Date : -----

Owner: .....

(To be prepared & submitted by each Construction Agency)

Activity Description	Procedure/ W.I./ Guidelines	Code of Conformance	Performing Function			Audit Function
			Performance	Checker	Approver	Customer Review/ Audit Requirements

PREPARED BY

REVIEWED

APPROVED BY

## ANNEXURES

### 2.0: MONTHLY CHECKLIST CUM COMPLIANCE REPORT REGARDING HSE (1/6)

Project: \_\_\_\_\_

Contractor: \_\_\_\_\_

Date: \_\_\_\_\_

Owner: \_\_\_\_\_

Inspection By: \_\_\_\_\_

**Note: write 'NC' (Not Concern) wherever any of the items are not applicable**

Item	Yes	No	Remarks	Action
<b>HOUSEKEEPING</b>				
Waste containers provided and used				
Sanitary facilities adequate and Clean				
Passageways and Walkways Clear				
General neatness of working areas				
Proper Material Storage				
Wooden Boards properly stacked and nails removed				
Cords, leads out of walk and traffic ways				
Scraps removed from the work site				
Other				
<b>PERSONNEL PROTECTIVE EQUIPMENT</b>				
Goggles: Shields				
Face protection				
Hearing protection				
Safety Shoes provided				
Hand protection				
Respiratory Masks etc.				
Safety Belts				
Safety Helmets				
Other				
<b>EXCAVATIONS / OPENINGS</b>				
Excavation permit				
Excavated earth kept away from edge				
Dewatering pump kept away from edge				
Safe access into excavated area				
Opening properly covered or barricaded				
Excavations shored				
Excavations barricaded				
Overnight lighting provided				
Other				

## ANNEXURES

### MONTHLY CHECKLIST CUM COMPLIANCE REPORT REGARDING HSE (2/6)

Item	Yes	No	Remark	Action
Welding Cutting				
Valid not work permit				
Flashback arrester provided for cylinders				
Power cable not crossing the welding cable				
Adequate earthing provided				
No combustible materials kept near welding & cutting works				
Gas cylinder chained upright & kept in trolleys				
Cables and hoses not obstructing				
Screens or shields used				
Flammable materials protected				
Fire extinguisher (s) accessible				
Other				
SCAFFOLDING				
Fully decked platform				
Guard and intermediate rails in place				
Toe boards in place & tied properly				
Adequate shoring				
Adequate access				
Other				
LADDERS				
Extension side rails 1 m above				
Top of landing				
Properly secured at top & bottom				
Angle $\pm 70^\circ$ from horizontal				
Other				

## ANNEXURES

### MONTHLY CHECKLIST CUM COMPLIANCE REPORT REGARDING HSE (3/6)

Item	Yes	No	Remark	Action
<b>HOISTS, CRANES AND DERRICKS</b>				
Condition of cables and sheaves OK				
Condition of slings, chains, hooks and eyes OK				
Inspection and maintenance logs maintained				
Outriggers used				
Singh/ barricades provided				
Signals observed and understood				
Qualified operators				
Other				
<b>MACHINERY, TOOLS AND EQUIPMENT</b>				
Proper instruction				
Safety devices				
Proper cords				
Inspections and maintenance				
Other				
<b>VEHICLE AND TRAFFIC</b>				
Rules and regulations observed				
Inspection and maintenance				
Licensed drivers				
Others				

## ANNEXURES

### MONTHLY CHECKLIST CUM COMPLIANCE REPORT REGARDING HSE (4/6)

Item	Yes	No	Remark	Action
TEMPORARY FACILITIES				
Emergency instruction posted				
Fire extinguishers provided				
Fire-aid equipment				
Secured against storm damage				
General nemeses				
In accordance with electrical requirements				
Other				
Fire Prevention				
Personnel instructed				
Fire extinguishers checked				
No smoking in prohibited areas				
Hydrants clear				
Other				
ELECTRICAL				
Proper wiring & earthing				
ELCB's provided				
Ground fault circuit interrupters				
Protection against damage				
Prevention of tripping hazards				
Proper electrical cable joints				
Light poles secured				
Clear way to power distribution board				
Proper rating of fuses				



## ANNEXURES

### MONTHLY CHECKLIST CUM COMPLIANCE REPORT REGARDING HSE (5/6)

Item	Yes	No	Remark	Action
<b>HANDLING AND STORAGE OF MATERIALS</b>				
Properly stored or stacked				
Passageways clear				
Other				
<b>FLAMMABLE GASES AND LIQUIDS</b>				
Containers clearly identified				
Proper storage				
Fire extinguishers nearby				
Other				
<b>WORKING AT HEIGHT</b>				
Erection plan				
Safety nets				
Safety belts tied properly				
Illumination				
No loose material at height				
No body under working area				
All openings covered				
Other				
<b>ENVIRONMENT</b>				
Chemical and other Effluents properly disposed				
Cleaning liquid of pipes disposed off properly				
Seawater used for hydrotesting disposed off as per agreed proceeding				
Lubricant Waste/ Engine oils properly disposed				
Waster from Canteen office, sanitation etc. disposed properly				
Disposal of surplus earth stripping materials, Oily rags and combustible materials done properly				
Green belt protection.				

## ANNEXURES

### MONTHLY CHECKLIST CUM COMPLIANCE REPORT REGARDING HSE (6/6)

Item	Yes	No	Remark	Action
HEALTH CHECK				
Hygienic conditions at labour camps OL				
Availability of First Aid facilities				
Proper sanitation at site, office and labour camps				
Arrangements of medical facility				
Measures for dealing with illness				
Availability of potable drinking waters for workmen & staff				
Provision of cretches for children				
ERECTION				
Slings/ D'shackle checked				
Signal Man				
Tag line for guiding the load				
Protecting the slings from sharp edges				
No loose materials at height				
Ladder & platform welding inspected				
No one under the suspended load				
Stay rope				
SWL				

-----  
Signature of Resident  
Engineer with Seal

## ANNEXURES

### Monthly Health, Safety & Environmental (HSE) Report (To be submitted by each Contractor)

Actual work start date: \_\_\_\_\_ For the month of: \_\_\_\_\_

Project: \_\_\_\_\_ Report No.: \_\_\_\_\_

Name of the Contractor: \_\_\_\_\_ Status as on: \_\_\_\_\_

Name of Work: \_\_\_\_\_ Name of Safety officer: \_\_\_\_\_

Item	This Month	Cumulative
Total strength (Staff – Workmen)		
Number of HSE meeting organised at site		
Number of HSE awareness programmes conducted at site		
Whether workmen compensation policy taken	Y/N	
Whether workmen compensation policy valid	Y/N	
Whether workmen registered under ESI Act	Y/N	
Number of Fatal Accident		
Number of Loss Time Accident (Other than Fatal)		
Other accident (non loss time)		
Total No. of accident		
Total man-hours worked		
Man-hour loss due to fire and accident		
Compensation cases raised with insurance		
Compensation cases resolved and paid to workmen		

Remark

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Safety Officer/RCM  
(Signature and name)

To: OWNER..... 1 COPY  
RCM/SITE-IN-CHARGE 1 COPY

## ANNEXURES

### SUPPLEMENTARY ACCIDENT, INCIDENT & NEAR MISS REPORT

Project: \_\_\_\_\_ Supplementary to Report No.: \_\_\_\_\_

(Copy enclosed)

Site: \_\_\_\_\_ Date: \_\_\_\_\_

Contractor: \_\_\_\_\_

---

NAME OF THE INJURED.....  
FATHER'S NAME.....  
SUB-CONTRACTOR M/S.....  
DATE & TIME OF ACCIDENT.....  
LOCATION.....

---

BRIEF DESCRIPTION & CAUSE OF A ACCIDENT

---

NATURE OF INJURY / DAMAGE

---

COMMENTS FROM MEDICAL PRACTITIONER WHO ATTENDED THE VICITIM/INJURED

---

SUGGESTED IMPROVEMENT IN THE WORKING CONDITION IF ANY

---

LOSS OF MANHOURS AND IMPACT ON SITE WORKS

---

ANY OTHER COMMENT BY SAFETY OFFICER

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_/

SIGNATURE OF CONTRACTOR WITH SEAL

To : OWNER..... 1 COPY  
: RCM/SITE-IN-CHARGE 1 COPY

## ANNEXURES

### ACCIDENT REPORT

(To be submitted by Contractor after every accident within 2 hours of accident)

Report No. \_\_\_\_\_

Date: \_\_\_\_\_

Name of Site: \_\_\_\_\_

COTRACTOR \_\_\_\_\_

NAME OF THE INJURED .....

FATHER'S NAME.....

SUB-CONTRACTOR M/S.....

DATE & TIME OF ACCIDENT.....

LOCATION.....

BRIEF DESCRIPTION OF ACCIDENT

CAUSE OF ACCIDENT

NATURE OF INJURY / DAMAGE

MEDICAL AID PROVIDED / ACTIONS TAKEN

INTIMATION TO LOCAL AUTHORITIES

Date : \_\_\_\_ / \_\_\_\_ / \_\_\_\_ /

SIGNATURE OF CONTRACTOR WITH SEAL

To : OWNER..... 1 COPY  
: RCM/SITE-IN-CHARGE 1 C

**ANNEXURE – C**

**CUGL - HEALTH, SAFETY AND ENVIRONMENT [HSE] SPECIFICATIONS**

**1.0 SCOPE**

These specifications establish the 'Health, Safety and Environment [HSE] Management' requirement to be complied with by the Contractors during executing their Job. Requirements stipulated in these specifications shall supplement the requirements of 'HSE Management' given in relevant act(s) / legislation(s).

**2.0 REQUIREMENTS OF 'HEALTH, SAFETY AND ENVIRONMENT [HSE] MANAGEMENT SYSTEM' TO BE COMPLIED BY BIDDERS**

- 2.1 Preferably, the Contractor should have a documented 'HSE Policy' to cover commitment of their organization to ensure health, safety and environment aspects in their line of operations or they must follow the 'HSE policy' of CUGL for safe execution of work.
- 2.2 The Contractor shall ensure that the CUGL's 'Health, Safety and Environment [HSE]' requirements are clearly understood and faithfully implemented at all level, at sites.
- 2.3 Contractor shall promote & develop consciousness for Health, Safety & Environment among all personnel working for the Contractor. Regular work-site meetings (Tool box talk) shall be arranged as 'HSE' activities to cover hazards involved in various operations during executing their jobs, location of First Aid Box, trained personnel to give First Aid, Assembly Points, and fire protection measures such as water and fire extinguishers etc.
- 2.4 Non-conformance of 'HSE' policy and directives as per CUGL by Contractor [including their sub-Contractors] as brought out during review/audit by CUGL / external agency authorized by CUGL, shall be complied by Contractor and its report to be submitted to CUGL.
- 2.5 Contractor shall adhere consistently to all provisions of 'HSE' requirements. In case of non-compliance of continuous failure in implementation of any of the 'HSE' provisions, CUGL may impose penalty and subsequent stoppage of work for non-compliance. The decision of imposing monetary penalty & work-stoppage shall be taken by EIC with consultation with Safety Officer of CUGL.
- 2.6 All fatal accidents and other personnel accidents shall be investigated for root cause by CUGL and Contractor shall extend all necessary help and cooperation in this regard. Recommend corrective and preventive actions of findings will be communicated to Contractor for taking suitable actions should be taken by the Contractors to avoid recurrence of such incidences.
- 2.7 Contractor shall ensure that all their staffs and workers, including their sub-Contractor(s), shall wear 'Personal Protective Equipment's [PPEs]' such as safety helmets, safety shoes, safety belts, dust mask, ear plug, protective goggles, gloves, etc., as per job requirements. All these gadgets shall conform to relevant IS specifications or equivalent.
- 2.8 Contractor shall assign competent & qualified personnel for carrying out various tasks/jobs as per requirement.
- 2.9 All equipment's should be tested and certified for its capacity before use.
- 2.10 Contractor shall ensure storage and utilization methodology of materials that are not detrimental to the environment. Where required, Contractor shall ensure that only the environment-friendly materials are used.
- 2.11 All persons deployed at site shall be knowledgeable of and comply with the environmental laws, rules and regulations relating to the hazardous material substances and waste. Contractor shall not dump release or

## ANNEXURE C – (CUGL - HSE)

otherwise discharge or dispose-off any such materials without the express authorization of EIC of CUGL.

- 2.12 Contractor should obtain all work permits before start of activities [as applicable] like hot work, cold work, confined space, electrical isolation, work at heights and its use & implement all precautions mentioned therein.
- 2.13 Contractor should display at site office and work locations caution boards, provide posters, banners for safe working to promote safety consciousness, etc.
- 2.14 Contractor should properly barricade the facility where work is in progress for safe working and reclaim the work zone after completion of work to promote safety consciousness.

### 3.0 **RELEVANT CODES FOR 'PERSONAL PROTECTION EQUIPMENTS'**

IS: 2925 - 1984	Industrial Safety Helmets
IS: 47701 - 1968	Rubber Gloves for Electrical Purpose
IS: 6994 - 1973 [Part-I]	Industrial Safety Gloves [Leather & Cotton Gloves]
IS: 1989 - 1986 [Part-II]	Leather Safety Boots & Shoes
IS: 5557 - 1969	Industrial & Safety Rubber Knee Boots
IS: 6519 - 1971	Code of Practice for Selections, Care & Repair of Safety Footwear
IS: 11226 - 1985	Leather Safety Footwear Having Direct Molding Sole
IS: 5983 - 1978	Eye Protectors
IS: 9167 - 1979	Ear Protectors
IS: 3521 - 1983	Industrial Safety Belts & Harnesses

### **GUIDELINES FOR IMPOSITION OF PUNITIVE FINES**

- 4.0 Punitive fines on contractors are imposed for violation of safety rules & regulations during execution of jobs. Objective of punitive fines is to work as deterrent for contractors in violation of safety rules & regulation and to improve safety atmosphere in general at all site.

### **PROPOSED GUIDELINES FOR IMPOSITION ARE DESCRIBED BELOW:**

- 4.1 For first time violation of safety rules & regulation by any contractor, HSE-officer will issue a warning letter to contractor with intimation to EIC of work centre with a copy to MD & DC.
- 4.2 In case of second time violation of safety rules & regulations by same contractor, EIC will call contractor in person and will have a meeting to discuss reason for repetitive violation along with HSE-Officer. A warning letter will also be issued by EIC to contractor.
- 4.3 In case of further violation, punitive fines will be imposed on contractor. Amount as fine will be decided as per severity of violation of safety. However, minimum fine would be Rs.5,000/- and in multiple of Rs.5,000/-, thereafter for every instant.
- 4.4 This will be limited to 5% of contract value, as maximum cumulative penalty.
- 4.5 This practice of punitive fines is to be implemented across all CUGL sites for all contracts.
- 4.6 Practice of punitive fines will be applicable for projects sites also and would be over and above the deduction made by M/s CUGL for safety violation from running bills.

 	 Central U.P. Gas Limited	PTS - SUPPLY OF MDPE FITTINGS, VALVES AND TRANSITION FITTINGS	P.014714 G 11031 045
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## CENTRAL U.P. GAS LIMITED (CUGL)

### LAYING OF MDPE NETWORK AND GI / Cu INSTALLATION WORK ALONG WITH REGISTRATION OF DOMESTIC CUSTOMERS" FOR CUGL IN KANPUR, UNNAO & BAREILLY GA IN U.P GA

PTS – SUPPLY OF MDPE FITTINGS, VALVES AND TRANSITION FITTINGS

0	26.05.2021	Issued for Work	PM	NN	NN
Rev.	Date	Subject of Revision	Prepared By	Checked By	Approved By



 	 Central U.P. Gas Limited	PTS - SUPPLY OF MDPE FITTINGS, VALVES AND TRANSITION FITTINGS	P.014714 G 11031 045
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 	 Central U.P. Gas Limited	PTS - SUPPLY OF MDPE FITTINGS, VALVES AND TRANSITION FITTINGS	P.014714 G 11031 045
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## 1.0 INTRODUCTION & SCOPE

Owner plans to augment the PE Network. The present document covers the technical specifications for the procurement of PE Fittings, Valves & Transition Fittings.

## 2.0 DEFINITIONS

Manufacturer	Means the Manufacturer of the PE Fitting, Valves and Transition Fitting
PTS	Means the present <<Particular Technical Specification>> and all its appendix, if any.
Third Party Inspection Agency	Means the Inspection Agency.
GTS	Means the present <<General Technical Specification>> and all its appendix, if any.

## 3.0 MATERIAL GRADE

The material grade of polyethylene PE Fittings shall be PE100. The bidder shall submit the details by clearly indicating the make, country of origin, part nos. /Product codes and catalogue number along with catalogues written in English for the Items quoted, in the Unpriced Bid.

The bidder shall provide approvals of internationally recognized authorities for their products along with their un-priced bids.

## 4.0 APPROVED MANUFACTURER FOR RAW MATERIAL

1. INEOS (Formerly SOLVAY)
2. BOROUGE
3. TOTAL PETROCHEMICALS
4. DOW
5. ELENAC
6. BOREALIS
7. LYONDELLBASELL

## 5.0 TRANSITION FITTINGS

Transition fittings shall be supplied in accordance with “Plastic piping systems for supply of gases fuels – Part 3: Fitting” EN 1555-3.

Bidder shall provide catalogue for all the fittings including transition fittings.

The material grade (SS-304 as per ASTM A-479) and end connection (in built EF Ends with integral pipe fixation device) shall be as per MR. Steel and MDPE pipe should be so joined in factory so as to have a monolithic joint, which is leak free and should be mechanically stronger than the PE pipe. On placement of order, the bidder shall submit the drawing with dimensions for approval of Owner before starting production.

### NOTE: -

- 1- Supply of Transition Fitting of 32mm x 1 Inch with coupler will be provided by the client for Industrial and Commercial Connectivity.
- 2- Contractor shall procure all MDPE fittings & MDPE Valves.

## 6.0 MDPE PIPE MATERIAL

The raw material of MDPE pipe shall be PE100, thick as per SDR11. The MDPE pipe shall confirm standards for polyethylene pipes for supply of gaseous fuels IS 14885 (latest edition).

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## 7.0 MATERIAL REQUISITION

As per SOR/Contract

## 8.0 QUALITY ASSURANCE (QA)

Manufacturer to submit their Inspection and Test Procedure (ITP) for the approval of Owner/PMC.

## 9.0 DEFECT LIABILITY PERIOD

Defect liability period shall be as per the GCC, of commercial volume I of II.

## 10.0 MARKING

Following information shall be embossed upto height of 0.15 mm onto the fitting and also in the

Form of bar code:

- a) Owner name as CUGL.
- b) Manufacturer's name and/or trademark
- c) Material and Designation
- d) Design application series
- e) The size of the fitting in mm
- f) Fusion time in seconds
- g) Cooling time in minutes
- h) Fusion parameters in BAR code
- i) Traceability code (fittings) as per standard ISO 12176-4.
- j) Number of the system standard. This information can be printed/formed directly on the fitting or on a label associated with the fitting or on an individual bag
- k) Production period, year and month

The marking shall stay legible during normal manipulation, storage and installation.

The marking shall not adversely influence the performance of the fitting and prevent the nonconformity of the fitting.

## 11.0 PACKAGING

All the MDPE fittings of more than one piece shall be kept in single box/packets according to type and size during packaging.

Packing size to be mentioned to ensure uniformity in delivery conditions of the material being procured. Bidder shall submit the packaging details during offer and also complied with at the time of delivery. The material for each SOR Item is essentially required to be packed in one case/packet /box.

### **AMENDMENT TO GTS 70000/740/GTS/0011**

#### 3.2 ADD

Branch piping/tapping saddle of sizes upto 63 mm OD shall preferably be supplied along with integral PE Clamp which is to ensure sufficient pressure welding and is to be left in place after the welding. Further, the upper shell of the Tapping Tees shall be a single piece to avoid dual welds.

#### 5.2 ADD

 	 	<b>PTS - SUPPLY OF MDPE FITTINGS, VALVES AND TRANSITION FITTINGS</b>	<b>P.014714 G 11031 045</b>
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The raw material PE, used for accessory production, is in compliance with all prescription in EN 1555-1 standards.

The raw material shall be virgin material belonging to class PE 100

The following are strictly forbidden:

- Use of recycled raw materials
- Mixing of different raw materials
- The addition of supplementary additives to the raw material.

#### **5.2.1 ADD**

Material and end connection of transition fittings shall be as per Owner/Owner's representative.

#### **6.3 REPLACE**

All accessories shall be of yellow colour.

#### **6.5.2 REPLACE**

Classification

Electrofusion accessories are divided into three classes according to the voltage and/or current characteristics.

Class A Electrical supply based on voltage set between 8V and 42 V

Class B Electrical supply based on voltage set between 42 V and 220 V

Class C Electrical supply based on power supply settings.

All supplies, unless otherwise stipulated in the order, concern Class A accessories.

Unless stipulated otherwise in the order, only "wrap-around" saddles, Electrofusion and Transition fittings with integral pipe fixation device to be supplied up to 63 mm dia.

Unless otherwise agreed between Owner/PMC and the supplier, all electrofusion accessories must be "single wire" type.

#### **6.5.3 REPLACE**

Connector (terminal pin) 4.0 mm/4.7mm shall be required.

#### **6.6 REPLACE**

The support drilling equipment to be designed so that during drilling the maximum immediate leak flow will never exceed 200 litres per hour at 5 bar pressure, in the main pipe. According to this flow rate, the supports are divided into two categories: - models 1 and 2 (refer to par. 3.2.) The required model will be specified when ordered.

The bell drill is equipped with a maneuver opening for the insertion of a requisite (range may vary from 5 mm to 21mm) hexagonal spanner/Allen Key.

The bell drill path is limited at the top by a limit block.

The drill mechanism is designed so that no additional tools (except the hexagonal spanner/Allen Key) are required for carrying out drilling operations. On placement of order the proposed sizes of hexagonal spanner/Allen Key required for various sizes of Tapping Saddle shall be informed by the bidder alongwith drawing of particular saddle for approval of Owner.

## 6.7 REPLACE

Flow M3/hr	Saddle type	Maximum load loss Mbar
10	32x20	1.0
10	63x20	1.0
10	63x32	1.0
10	125x32	1.0
10	180x32	1.0
40	125x63	1.0
40	180x63	1.0

## 12 REPLACE

All electro fusion accessories must be printed with a bar code or bar code with an individual magnetic card (manual setting information for data transfer purposes must be supplied in bar code). The magnetic card contains the welding parameters that have been encoded in the magnetic track, as well as the bar code printed on the card. Coding must be carried out according to prescriptions included in ISO TR 13950 standards. The bar codes shall be laminated to ensure that the details are not damaged or erased.

### AMENDMENT TO GTS 70000/740/GTS/0012

#### 1 REPLACE

The Compounds that meet this specification must be PE 100.

The colour shall be yellow or black in accordance with the local requirements.

#### 3.2 ADD

Minimum Required Strength (MRS 8 & 10)

Standardized class of compounds for which the LCL is equal to 8 & 10 respectively.

#### 3.3 ADD

PE 100

Standard designation for PE compounds in class MRS 10

#### 4.0 ADD

The PE compounds that are acceptable according to the requirements of this specification must conform to the requirements for PE 100 described in prEN 1555-1.

### AMENDMENT TO GTS 70000/740/GTS/0015

#### 1.0 ADD

It applies to bidirectional valves with spigot ends or electro fusion sockets intended to be fused with polyethylene pipes in accordance with the IS 14885 PE pipe specification and with spigot fittings in accordance with the TBL 70000/740/GTS/0011.

#### 3.7 ADD

Base Plate

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Model 2 is applicable for present project.

#### 6.2 ADD

The valve will be designed for a maximum operating pressure (mop) equal to 8 & 10 bar.

#### 6.3 ADD

BULLET: 2

The colour of the PE valve shall be black/yellow.

#### 7.4 REPLACE

##### **PRESSURE DROP AT LOW PRESSURE**

Nominal diameter dn.	Flow M3/hr
32	10
63	60
125	450
180	765

#### 8.0 ADD



Marking

b) Material and designation (e.g. PE 100)

DELETE

f) Traceability Code (Valve and Component as per standard ISO/FDIS 12176-4

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## CENTRAL U.P. GAS LIMITED (CUGL)

### LAYING OF MDPE NETWORK AND GI / Cu INSTALLATION WORK ALONG WITH REGISTRATION OF DOMESTIC CUSTOMERS" FOR CUGL IN KANPUR, UNNAO & BAREILLY GA IN U.P GA

PTS - GI PIPES



0	26.05.2021	Issued for Work	PM	NN	NN
<b>Rev.</b>	<b>Date</b>	<b>Description</b>	<b>Prepared by</b>	<b>Checked by</b>	<b>Approved by</b>

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## 1.0 INTRODUCTION AND SCOPE

Owner plans to augment PNG network. It supplies natural gas to Domestic & Commercial & Industrial consumers.

This present document covers the technical specification for the procurement of GI Pipes used in high pressure natural gas transportation and distribution systems. It describes the general requirements, controls, tests, QA/QC examination and final acceptance criteria which needs to be fulfilled.

This specification covers the requirements for GI pipes of heavy steel tube. Unless modified by this specification, requirements of IS 1239 (Part-I): 2004 (Latest edition) shall be valid.

## 2.0 DEFINITIONS

Manufacturer	Means the Manufacturer of the GI pipe.
PTS	Means the present <<Particular Technical Specification>>and all its appendix, if any.
TPIA	Means the Third-Party Inspection Agency.
GTS	Means the present <<General Technical Specification>> and its entire appendix, if any.

## 3.0 MATERIAL

The material used for the manufacturing of GI pipes confirming to IS 1239 (Part -1): 2004 (Latest edition).

## 4.0 DIMENSIONS, THICKNESS & DIMENSIONAL TOLERANCES

The dimensions & nominal mass of tubes shall be in accordance with Table 5 subject to the tolerances permitted in CL.8.1 & 9 of IS 1239 (Part-I): 2004 (Latest edition). Length of each pipe shall be 6 mtrs with. + 6, - 0 mm tolerance. However, pipe length shall be considered 6 m. only for measurement / payment purpose.



Nominal Diameter DN	15 mm	20 mm
Grade	Heavy	Heavy
Outer Dia. (Max. / Min.)	21.8 mm / 21.0 mm	27.3 mm / 26.5 mm
Thickness (mm)	3.2	3.2
Nominal weight (Kg / m)	1.44	1.87

## 5.0 END CONNECTION OF PIPE

GI Pipes shall be supplied with plain end.

## 6.0 FREEDOM FROM DEFECTS

On visual examination the outside & inside surfaces of pipes shall be smooth & free from defects such as cracks etc.

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## 7.0 GALVANIZING

- i. Pipes shall be galvanized to meet the requirement of IS: 4736 – 1986 with latest amendment.
- ii. Zinc conforming to any grade specified in IS: 13229- 1991 with latest amendment shall be used for the purpose of galvanizing.
- iii. Galvanizing bath: The molten metal in the galvanizing bath shall contain not less than 98.5% by mass of zinc.
- iv. Mass of zinc coating: Minimum mass of zinc coating determined as per IS: 6745 shall be 360 gms/m<sup>2</sup>.
- v. Uniformity of galvanized coating: The galvanized coating when determined on a 100 mm long test piece in accordance with IS 2633: 1986 with latest amendment shall withstand 5 one – minute dips.
- vi. Freedom from defect: The zinc coating on internal & external surfaces shall be uniform adhered, reasonably smooth & free from such imperfections as flux, ash & drop inclusions, bare patches, black spots, pimples, lumpiness runs, rust stains, bulky white deposits & blisters. Rejection & acceptance for these defects shall be as per Appendix - A of IS 2629: 1985 with latest amendments.
- vii. Samplings
  - a) All materials of the same type in coating bath having uniform coating characteristics shall be grouped together to continue a lot. Each lot shall be tested separately for the various requirements of the specification. The number of units to be selected from each lot for this purpose shall be IS: 4711 1995 with latest amendment.
  - b) The sample selected according to Clause 6.1 & 6.2 of IS: 4736 – latest edition.
  - c) The sample found conforming to above requirements shall then be tested for mass of zinc coating in accordance with Clause 5.1 of IS: 4736 – 1986 with latest amendment.
  - d) Criteria for conformity: As per IS: 4736 – 1986 with latest amendments.

## 8.0 PRESSURE TEST

Hydrostatic pressure test shall be carried out at a pressure of 5 Mpa for the duration of at least 3 second and shall not show any leakage in the pipe. Vendor to submit the internal pressure test certificate for the same. Owner Representative or Third-party Inspection Agency appointed by Owner shall witness finish goods testing as per the sample procedure specified in IS: 1239 (Part-1) – latest edition.



## 9.0 MARKING

Each pipe shall be embossed with Owner's logo, manufacturer's name or trademark, size designation, class of pipe at the interval of not more than 1 meters.

Each packing containing pipes shall carry the following embossed, stamped or written by indelible ink.

- a) Manufacturers name or trademark.
- b) Class of pipe – Heavy
- c) Indian standard mark (ISI)
- d) Lot number / Batch no. of production

Each pipe conforming to this standard shall also be marked with BIS standard mark.

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## 10.0 INSPECTION / DOCUMENTS

Inspection shall be carried out as per Owner Technical Specification.

Owner Representative or Third-Party Inspection Agency appointed by Owner shall carry out stage wise inspection during manufacturing / final inspection.

The manufacturer shall have a valid licence to use ISI monogram for manufacturing of pipe in accordance with the requirement of IS:1239.

Vendor shall furnish all the material test certificates, proof of approval / licence from specified authority as per specified standard, if relevant, internal test / inspection reports as per Owner Tech. Spec. & specified code for 100% material, at the time of final inspection of each supply lot of material.

For any control, test or examination required under the supervision of TPIA/Owner/Owner's representative, latter shall be informed in writing one (1) week in advance by vendor about inspection date and place along with production schedule.

Even after third party inspection, Owner reserves the right to select a sample of pipes randomly from each manufacturing batch & have these independently tested. Should the results of these tests fall outside the limits specified in Owner technical specification, then Owner reserves the right to reject all production supplied from the batch.

## 11.0 PACKAGING

Packing size to be mentioned to ensure uniformity in delivery conditions of the material being procured. Bidder shall submit the packaging details during QAP and also complied with at the time of delivery.

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   <small>Central U.P. Gas Limited</small>	PTS – G.I. FITTINGS	<b>P.014714</b> <b>G 11031</b> <b>047</b>
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## CENTRAL U.P. GAS LIMITED (CUGL)

### LAYING OF MDPE NETWORK AND GI / Cu INSTALLATION WORK ALONG WITH REGISTRATION OF DOMESTIC CUSTOMERS" FOR CUGL IN KANPUR, UNNAO & BAREILLY GA IN U.P. GA

PTS - GI FITTINGS

0	26.05.2021	Issued for Work	PM	NN	NN
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   Central U.P. Gas Limited	PTS – G.I. FITTINGS	P.014714 G 11031 047
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## 1.0 INTRODUCTION AND SCOPE

Owner plans to augment PNG network. It supplies natural gas to domestic & commercial consumers.

This present document covers the technical specification for the procurement of GI fittings used in high pressure natural gas transportation and distribution systems. It describes the general requirements, controls, tests, QA/QC examination and final acceptance criteria which need to be fulfilled.

This specification covers the requirements for Malleable Cast Iron Fittings unless modified by this specification, requirements of IS 1879 – latest edition shall be valid.

## 2.0 DEFINITIONS

Manufacturer	Means the Manufacturer of the GI fittings.
PTS	Means the present <<Particular Technical Specification>>and its appendix, if any.
TPIA	Means the Third-Party Inspection Agency.
GTS	Means the present <<General Technical Specification>> and its entire appendix, if any.

## 3.0 MATERIAL

The material used for the manufacturing of GI fittings shall conform to ISI 14329 – 1995 with latest amendments Grade BM 300.

## 4.0 DIMENSIONS & DIMENSIONAL TOLERANCES

- i. Dimensions of various types of fittings shall be as specified in sections 2 to 10 of IS 1879 – 1987 with latest amendments, as applicable.
- ii. Wall thickness of fittings and tolerances on them shall be as given in Table 1.2 of S 1879 – 1987 with latest amendments,
- iii. In case of reducing fittings, the dimensions at each outlet shall be those appropriate to the nominal size of the outlet.
- iv. Elbows, Tees, Sockets and caps shall be of reinforced type.

## 5.0 WEIGHT

Weights of various types of fittings shall be as specified in sections 2 to 10 of S 1879 – 1987 with latest amendments, as applicable.

## 6.0 THREADS

- i. Threads shall be NPT type and conforming to ASME B1.20.1.
- ii. Outlets of fittings shall be threaded to dimensions & the tolerances as specified in ASME B1.20.1.
- iii. All internal & external threads shall be tapered.
- iv. For checking conformity of threads gauging practice in accordance with ASME B1.20.1 shall be followed.
- v. Chamfering: The outlet of fittings shall have chamfer.

  	<p align="center"><b>PTS – G.I. FITTINGS</b></p>	<p align="center"><b>P.014714 G 11031 047</b></p>
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## **7.0 FREEDOM FROM DEFECTS**

On visual examination, the outside & inside surfaces of fittings shall be smooth & free from any defects such as cracks, injurious flaws, fine sand depth etc.

## **8.0 GALVANIZING**

- i. Fittings shall be galvanized to meet the requirement of IS: 4759 – 1996 with latest amendments.
- ii. Zinc conforming to any grade specified in IS: 13229-1991 with latest amendments shall be used for the purpose of galvanizing.
- iii. Galvanizing bath: The molten metal in the galvanizing bath shall contain not less than 98.5% by mass of zinc.
- iv. Coating requirements: Mass of coating shall be 610 - 700 gms/m<sup>2</sup>.
- v. Freedom from defect: The zinc coating shall be uniform adhered, reasonably smooth & free from such imperfections as flux, ash bare patches, black spots, pimples, lumpiness runs, rust stains, bulky white deposits & blisters.
- vi. Samplings
  - a) All materials of the same type in coating bath having uniform coating characteristics shall be grouped together to continue a lot. Each lot shall be tested separately for the various requirements of the specification. The number of units to be selected from each lot for this purpose shall be given in Table 2 of IS 4759 – latest edition.
  - b) The sample selected according to Column 1 & 2 of Table 2, IS: 4759 – latest edition shall be tested for visual requirements as per Clause 6.2 of IS:4759 – latest edition
  - c) The sample found conforming to above requirements shall then be tested for mass of zinc coating in accordance with Clause 9.2 of IS: 4759 – latest edition.
  - d) Criteria for conformity: As per Clause 8.3 of IS: 4759-latest edition.
  - e) Test procedure shall be as per Clause 9 of IS: 4759-latest edition.

## **9.0 PRESSURE TEST**

Vendor shall carry out pneumatic pressure test as per Clause 11.1b of 1879 – 1987 with latest amendments on each & every fittings. Vendor to submit the Internal Quality control certificate for the same. Owner shall witness pneumatic testing as per the sampling procedure specified in 1879 – 1987 with latest amendments.

## **10.0 COMPRESSION TEST**

This test shall be conducted to judge the malleability of the pipe fittings & shall be carried out as per Clause 12 of 1879 – 1987 with latest amendments.

## **11.0 SAMPLING**

Owner Representative of Third-Party Inspection Agency appointed by Owner shall witness the tests as per clause 14 of 1879 – 1987 with latest amendments. However, vendor to perform 100% inspection of visual, dimensional & pressure test. Vendor shall furnish Internal test certificates at the time of final inspection to the Owner.

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## 12.0 MARKING

Each fitting shall be embossed with OWNER's logo, manufacturer's name or trademark and the size designation.

Each packing containing fittings shall carry the following embossed, stamped or written by indelible ink.

- a. Manufacturer's name or trademark.
- b. Designation of fittings.
- c. Lot number.

Each fitting conforming to this standard shall also be marked with BIS standard mark.

## 13.0 PACKAGING

Packing size to be mentioned to ensure uniformity in delivery conditions of the material being procured. Packing size shall be approved by owner / owner's representative before packing the material. The vendor shall submit the packaging details during QAP and also complied with at the time of delivery.

## 14.0 INSPECTION / DOCUMENTS

- i. Inspection shall be carried out as per Owner Technical Specification.
- ii. Owner Representative or Third-Party Inspection Agency shall carry out stage wise inspection during manufacturing / final inspection.
- iii. Vendor shall furnish all the material test certificates, proof of approval / licence from specified authority as per specified standard, if relevant, internal test / Inspection reports as per Owner Tech Spec. & specified code for 100% material, at the time of final inspection of each supply lot of material.
- iv. Even after third party inspection, Owner reserves the rights to select a sample of fittings randomly from each manufacturing batch & have these independently tested. Should the results of these tests fall outside the limits specified in Owner technical specification, then Owner reserves the rights to reject all production supplied from the batch.

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At the helm of the Energy Transition, Tractebel provides a full range of engineering and advisory services throughout the life cycle of its clients' projects, including design and project management. As one of the world's leading engineering and advisory companies and with more than 150 years of experience, it's our mission to actively shape the world of tomorrow. With about 5,000 experts and presence in more than 70 countries, we are able to offer our customers multidisciplinary solutions in energy, water and urban.

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