

कार्यालय प्रमुख अभियंता
लोक स्वास्थ्य यांत्रिकी विभाग
तृतीय तल, ब्लॉक-बी-4 इन्द्रावती भवन, नवा रायपुर, अटल नगर, छत्तीसगढ़

क्रमांक 41 / स्था.शा. / प्र.अ. / लो.स्वा.यां.वि. / 2022 नवा रायपुर, दिनांक 22/03/2022

Amendment No. 06/2021-22

यू.एस.ओ.आर. समिति द्वारा की बैठक दिनांक 17.02.2022 में की गई अनुशंसा एवं प्राप्त प्रस्ताव अनुसार विभागीय यू.एस.ओ.आर. जारी दिनांक 01 जून, 2020 के Chapter no. IX में नवीन Item no. 9.1A को शामिल किया जाता है विवरण निम्नानुसार है:-

S.No.	Details of Items added in the USOR																				
1.	<p style="text-align: center;">CHAPTER - IX HIGH DENSITY POLYETHYLENE PIPE (PE PIPE)</p> <p>NOTES FOR ITEM NO. 9.1A:</p> <p>1. This specification covers the requirements for successfully designing manufacturing, supplying, laying, jointing and testing at works and site of High Density Polyethylene Pipes used for water supply. Use of HDPE Pipes shall be of pressure class of minimum PN 6 or above.</p> <p>2. Applicable Codes The manufacturing, testing, supplying, laying, jointing and testing at work sites of HDPE pipe shall comply with IS: 4984-2016 all currently applicable status, regulations, standards and amendments and others as follows -</p> <table><tr><th>Code no.</th><th>Title/Specification</th></tr><tr><td>IS 4984</td><td>High Density Polyethylene Pipes renamed as PE (Polyethylene Pipes) for Water Supply</td></tr><tr><td>IS 2530</td><td>Methods of test for polyethylene molding materials and polyethylene compounds GRP Pipes, Joints and Fittings for use for Potable Water Supply</td></tr><tr><td>IS 5382</td><td>Rubber sealing rings for gas mains, water mains and sewers.</td></tr><tr><td>IS 4905</td><td>Methods for random sampling</td></tr><tr><td>IS 7328</td><td>High density polyethylene materials for molding and extrusion</td></tr><tr><td>IS 7634</td><td>Laying & Jointing of Polyethylene (PE) Pipes</td></tr><tr><td>IS 9845</td><td>Method of analysis for the determination of specific and/or overall migration of constituents of plastics material and articles intended to come into contact with foodstuffs.</td></tr><tr><td>IS 10141</td><td>Positive list of constituents of polyethylene in contact with food stuffs, pharmaceuticals and drinking ware.</td></tr><tr><td>IS 10146</td><td>Polyethylene for its safe use in contact with foodstuff, Pharmaceuticals and drinking water.</td></tr></table>	Code no.	Title/Specification	IS 4984	High Density Polyethylene Pipes renamed as PE (Polyethylene Pipes) for Water Supply	IS 2530	Methods of test for polyethylene molding materials and polyethylene compounds GRP Pipes, Joints and Fittings for use for Potable Water Supply	IS 5382	Rubber sealing rings for gas mains, water mains and sewers.	IS 4905	Methods for random sampling	IS 7328	High density polyethylene materials for molding and extrusion	IS 7634	Laying & Jointing of Polyethylene (PE) Pipes	IS 9845	Method of analysis for the determination of specific and/or overall migration of constituents of plastics material and articles intended to come into contact with foodstuffs.	IS 10141	Positive list of constituents of polyethylene in contact with food stuffs, pharmaceuticals and drinking ware.	IS 10146	Polyethylene for its safe use in contact with foodstuff, Pharmaceuticals and drinking water.
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3. Colour

The colour of the High Density Polyethylene Pipe (PE Pipe) shall be black.

The colour of the High Density Polyethylene Pipe (PE Pipe) shall be black with blue identification stripes for the purpose of identification of the pipes covered in this standard.

Identification Stripes : Each black pipe which shall contain minimum three longitudinal stripes of width 3 mm (Min) in blue colour, circumferentially distributed. These stripes shall be co-extruded during pipe manufacturing and shall not preferably be more than 0.2 mm in depth for wall thickness up to 10mm and 0.5mm beyond 10mm. The materials of the stripes shall be of the same type as used in the base compound for the pipes.

4. Materials

The materials used for the manufacture of pipes should not constitute toxic hazard, should not support microbial growth and should not give rise to unpleasant taste or odour, cloudiness or discolouration of water. Pipe manufactures shall obtain a certificate to this effect from the manufacturer of raw material.

5. Raw Materials

- (a) The PE resin used for the manufacture of pipes shall conform to parameters mentioned in Table 2 (IS 4984 : 2016). In addition, the resin shall conform to requirement of IS 7328.
- (b) The material classification and conformity to Table 2 (IS 4984 : 2016) shall be provided by the raw material (resin) manufacturer with documentation duly certified by resin manufacturer.
- (c) Carbon black master batch shall be manufactured as per 5.3 of (IS 4984 : 2016)
- (d) The resin/material shall be compounded with Carbon black. The Carbon black content in the material shall be within $2.5 \pm 0.5\%$ and the dispersion of carbon black shall be satisfactory tested as per IS: 2530

6. Anti Oxidant

The percentage of anti-oxidant used shall not be more than 0.3 percent by mass of finished resin. The anti-oxidant used shall be physiologically harmless and shall be selected from the list given in IS 10141.

7. Rework Material

Clean, reprocessable material generated from a manufacturer's own production and works testing of product according to this standard may be used if it is derived from the same raw material as used for the relevant production. Reprocessable material obtained from external sources and recycled material shall not be used.

8. Dimension & Maximum Ovality of Pipe

The outside diameter of pipes, tolerance on the same and ovality of pipe shall be as given in Table 3 and Standard Dimension Ratio (SDR) and corresponding wall thickness (e) of pipe shall be as given in Table 4 as per IS 4984:2016 (Clause 7.4)

S.No.	Details of Items added in the USOR
	<p>9. Visual Appearance The internal and external surface of the pipe shall be smooth, clean and free from grooving and other defects. The ends of the pipes shall be cleanly cut square with the axis of the pipe to within the tolerances given as per para 7.1 of IS 4984:2016 and free from deformity. Slight shallow longitudinal grooves or irregularities in the wall thickness shall be permissible, provided that the wall thickness remains within the permissible limits.</p> <p>10. Length of straight Pipe The Length of straight pipe used be more than 6m or as agreed by Engineer-in-charge. Short length of 3 meter (minimum) up to a maximum of 10% of the total supply may be permitted. Pipe beyond 110mm dia shall be supplied in straight length not less than 6m.</p> <p>11. Coiling The pipes supplied in coils shall be coiled on drums of minimum diameter of 18 times the nominal diameter of the pipe ensuring that kinking of pipe is prevented.</p> <p>12. Marking of pipe/Coil Each straight length of pipe shall be clearly marked in indelible ink/paint on either end and for coil at both ends or hot embossed on white base every meter throughout the length of pipe/coil with the following information: (a) Manufacturer's name/Trade-mark. (b) Material Designation (c) Pressure rating (d) Standard Dimension Ratio (SDR) (e) Outside diameter (f) Lot No./Batch No. containing information of date of manufacture (g) BIS certification marking on each pipe.</p> <p>13. Performance Requirements: The Pipe shall meet the requirement of IS 4984:2016 for tests like, Internal Pressure Creep Rupture test for pipe-Acceptance & Type Test, Internal Pressure Creep Rupture test-for Pipe Joint, Longitudinal Reversion test, Carbon Black Content & Dispersion, Melt flow rate test, Oxygen Induction Time, Overall migration, Density, Tensile Butt Fusion, Elongation at break & Slow Crack Propagation Rate etc.</p> <p>14. Handling, Transportation storage and Lowering of pipes.</p> <ul style="list-style-type: none"> • If transportation of PE pipes from a distance greater than 300km than pipes shall be received only when bare coils of pipe have been wrapped with hessian cloth. • The truck for transportation of the PE pipes shall be exclusively used for PE pipes only with no other material loaded-especially no metallic, glass and wooden items. The truck shall not have sharp edges that can damage the pipe. • At the time of opening coils it must be remembered that the coils are under tension and must be open in control manner. • Straight length should be stored on horizontal racks giving continuous support. • Loss/damages during transit, handling, storage will be to the contractor's account.

15. Test to Establish Perfectibility/portability of work

Specimen of pipe shall be tested to establish the suitability for use in carrying potable water

- i. Smell of the extract
- ii. Clarity of the colour of the extract
- iii. Acidity and Alkalinity
- iv. Global migration UV absorbing material Heavy metals
- v. Unreacted monomers (styrene) and biological test

16. Hydraulic Test after laying.

After laying the pipe hydraulic test shall be done to conform the quality of work and material. There should not be any signs of localized swelling, leakage or weeping.

17. Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/specials to lift and lower the same. Inspection of pipes and fittings for detects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

18. Measurement

- a) The net length of fixed pipe shall be measured in running meters correct to 10mm. The portion of the pipe inside the joints shall not be included in the length of pipe work, specials shall be excluded and measured and paid separately under the relevant item.
- b) PE Pipes & Fittings are designated by Outer diameter.

19. Standard Quality Assurance Plan (QAP) is enclosed as Annexure-A for TPI by recommended agency of department at factory.

20. This USOR contains the rates of all the items without GST. No claims against GST shall be entertained at any level. GST shall be paid by the Agency/Contractor directly to the concerning department. However, All the estimates prepared on this USOR will include GST, as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

HIGH DENSITY POLYETHYLENE PIPE (PE PIPE)

S.No.	Items	Unit	Rates in Rs.		
9.1A	Providing, Laying, Jointing & field testing of PE pipes made from 100% virgin material (Earlier know as High Density Polyethylene Pipes, PE 100) confirming to IS 4984/14151/ 12786/13488 with necessary jointing material like mechanical connector of jointing pipes by heating to the ends of pipes with the help of Teflon coated electric mirror/ heater to the required temperature and then mechanically pressing the ends together against each other, to form a monolithic & leak proof joint by thermosetting process. It may be required to be done with Jack/ Hydraulic Jacks/Butt fusion machine. (50 mm above fusion jointed & below 50mm mechanical jointed)				
	Pressure →		6Kg/ sq.cm:	8Kg/ sq.cm:	10Kg/ sq.cm:
	63 mm dia	R.mtr	113.00	139.00	173.00
	75 mm dia	R.mtr	160.00	197.00	244.00
	90 mm dia	R.mtr	228.00	281.00	350.00
	110 mm dia	R.mtr	366.00	421.00	515.00
	125 mm dia	R.mtr	441.00	535.00	656.00
	140 mm dia	R.mtr	554.00	673.00	821.00
	160 mm dia	R.mtr	724.00	882.00	1075.00
	180 mm dia	R.mtr	910.00	1106.00	1361.00
	200 mm dia	R.mtr	1128.00	1368.00	1674.00
	225 mm dia	R.mtr	1426.00	1729.00	2126.00
	250 mm dia	R.mtr	1759.00	2128.00	2612.00
	280 mm dia	R.mtr	2194.00	2675.00	3282.00
	315 mm dia	R.mtr	2768.00	3390.00	4150.00

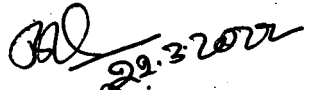
यह आदेश तत्काल प्रभावशील माना जावे।

9.2.3.2022

प्रमुख अभियंता
लोक स्वास्थ्य यांत्रिकी विभाग
छत्तीसगढ़, नवा रायपुर

प्रतिलिपि :-

- 1) अपर मुख्य सचिव, छत्तीसगढ़ शासन, लोक स्वास्थ्य यांत्रिकी विभाग, मंत्रालय, महानदी भवन, नवा रायपुर की ओर सूचनार्थ।
- 2) सचिव, छत्तीसगढ़ शासन, लोक स्वास्थ्य यांत्रिकी विभाग, मंत्रालय, महानदी भवन, नवा रायपुर की ओर सूचनार्थ।
- 3) मिशन संचालक, जल जीवन मिशन, नीर भवन, रायपुर की ओर सूचनार्थ।
- 4) प्रमुख अभियंता, जल संसाधन विभाग/लोक निर्माण विभाग, छत्तीसगढ़ की ओर सूचनार्थ।
- 5) महालेखाकार, छत्तीसगढ़, रायपुर की ओर सूचनार्थ।
- 6) मुख्य तकनीकी परीक्षक, छत्तीसगढ़, इंद्रावती भवन, नवा रायपुर की ओर सूचनार्थ।
- 7) मुख्य अभियंता, लोक स्वास्थ्य यांत्रिकी विभाग, परिक्षेत्र रायपुर/बिलासपुर/जगदलपुर की ओर सूचनार्थ एवं पालनार्थ प्रेषित।
- 8) अधीक्षण अभियंता, लो.स्वा.यां.वि., मंडलरायपुर/दुर्ग/बिलासपुर/अंबिकापुर/जगदलपुर/कोण्डागांव एवं (वि./यां.) मंडल रायपुर की ओर सूचनार्थ एवं पालनार्थ प्रेषित।
- 9) कार्यपालन अभियंता, लोक स्वास्थ्य यांत्रिकी, खंड/परियोजना खंड/(वि./यां.) खंड की ओर सूचनार्थ एवं पालनार्थ प्रेषित।



प्रमुख अभियंता

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छत्तीसगढ़, नवा रायपुर