Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***15230-004.0***
Date:	***8/22/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Variance HDPE		
Reviewed By:	Jim Ewing		

SUBMITTAL REVIEW		
Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.		
Approved	☐	No Exceptions
	☐	Make Corrections Noted - See Comments
	☐	Make Corrections Noted - Confirm
Not Approved	☒	Correct and Resubmit
	☐	Rejected - See Remarks
Receipt Acknowledged	☐	Filed for Record
	☐	With Comments - Resubmit

Review Comments:

1. Please provide a list of the pipes proposed for change under this variance along with their fluid content, size, test pressure, current and proposed inside diameter, and type of joint(s),
2. If you are planning on “snaking” the pipe, please provide the manufacturer’s recommended allowable bending radius and force to attain that bend vs temperature for each pipe size.
3. Please note that Specification Section 15230 does not cover polyethylene pressure pipe.

☑ High Priority

CONTRACTOR SUBMITTAL TRANSMITTAL FORM REV. A

Owner: County of Hawaii
Contractor: Nan, Inc.
Project No.: WW-4705R
Project Name: Hilo WWTP Phase 1
Submittal Number: 15230-004.0
Submittal Title: Variance: HDPE
☐ For Information Only
TO: County
From: Nan Inc.

Specification No. and Subject of Submittal / Equipment Supplier			
Spec: 15230-003.0	**Paragraph:** 1.04		
Authored By: Brandon Farrell		**Date Submitted:**	8/20/2025

Submittal Certification

Check Either (A) or (B):

☐ (A) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with no exceptions.

☑ (B) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings except for the deviations listed.

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

General Contractor's Reviewer's Signature:

Printed Name and Title: Brandon Farrell, Civil Manager

In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.

Firm: **Signature:** **Date Returned:**

PM/CM Office Use

Date Received GC to PM/CM:
Date Received PM/CM to Reviewer:
Date Received Reviewer to PM/CM:
Date Sent PM/CM to GC:

Nan, Inc

PROJECT: HILO WWTP REHABILITATION AND REPLACEMENT PROJECT - PHASE 1

JOB NO. WW-4705R

THIS SUBMITTAL HAS BEEN CHECKED BY THIS CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL (UPON APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED 8/20/2025
SPECIFICATION SECTION # 15230
SPECIFICATION PLASTIC PIPING AND TUBI
PARAGRAPH 1.04
DRAWING N/A
SUBCONTRACTOR N/A
SUPPLIER N/a
MANUFACTURER Centenial Plastics

CERTIFIED BY CQCM or Designee :

Nan Inc

License #ABC-19711
161 Silva St.
Hilo, Hi 96720
Telephone: (808) 842-4929
Facsimile: (808) 841-8281

Hilo Wastewater Treatment Plant Phase 1
Contract No. WW-4705R

VARIANCE

Request Form

Variance Request

We are requesting approval to utilize flexible polyethylene pipe in specific areas where unforeseen utility conflicts arise during installation of proposed pipelines. The utilization of more rigid PVC pipe presents a risk of interference or unnecessary appurtenances when conflicts arise. The use of flexible polyethylene pipe would provide the necessary adaptability to maneuver around existing utility lines without compromising structural integrity or utility separation requirements. This material substitution will help maintain installation progress, reduce the risk of damaging existing utilities, and minimize excavation footprint in constrained zones. This variance would only be used for PVC pipe and when necessary.

Specification section 15230 – Plastic Piping and Tubing

1. What are the benefits the variance has to the Government?

The use of flexible polyethylene pipe would provide greater workability and limit delays when existing and unforeseen utilities arise.

2. What are the positive and negative impacts to the project and Government if the variance is accepted?

No positive or negative impacts

3. Discuss how the variance is “equal to” or “better than” the specification requirement.

Material has pliability for changes and will require less fittings.

4. What is the cost of the product/material that is originally specified?

No cost impacts

SECTION 15230

PLASTIC PIPING AND TUBING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Plastic pipe, tubing, and fittings.

1.02 REFERENCES

A. American Society of Mechanical Engineers (ASME):
   1. B16.12 - Cast Iron Threaded Drainage Fittings.

B. ASTM International (ASTM):
   1. D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
   2. D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
   3. D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
   4. D1869 - Standard Specification for Rubber Rings for Asbestos-Cement Pipe.
   5. D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated (SDR Series.
   6. D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
   7. D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
   8. D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
   9. D2513 - Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings.
   10. D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
   11. D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
   12. D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride)(PVC) Pipe and Fittings.
   13. D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
   14. D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
   15. D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
   16. D3350 - Standard Specification for Polyethylene Plastic Pipes and Fittings Materials.
   17. D4101 - Standard Specification for Polypropylene Injection and Extrusion Materials.

18. F438 - Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40.
19. F439 - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
20. F441 - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
21. F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
22. F493 - Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
23. F645 - Standard Guide for Selection, Design and Installation of Thermoplastic Water-Pressure Piping Systems.
24. F679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
25. F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

C. American Water Works Association (AWWA):
1. C900 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inches to 12 Inches (100 mm Through 300 mm), for Water Transmission Distribution.

D. NSF International (NSF).

E. Plastics Pipe Institute (PPI):
1. TR 31 - Underground Installation of Polyolefin Piping.

1.03 ABBREVIATIONS

A. ABS: Acrylonitrile-butadiene-styrene.

B. CPVC: Chlorinated polyvinyl chloride.

C. DR: Dimension ratio.

D. DWV: Drain, waste, and vent.

E. ID: Inside diameter of piping or tubing.

F. NPS: Nominal pipe size followed by the size designation.

G. NS: Nominal size of piping or tubing.

H. PE: Polyethylene.

I. PP: Polypropylene.

J. PVC: Polyvinyl chloride.

K. SDR: Standard dimension ratio; the outside diameter divided by the pipe wall thickness.

1. see variance request form

1.04 SUBMITTALS

A. Submit as specified in Section 01330 - Submittal Procedures.

1.

B. Product data: As specified in Section 15052 - Common Work Results for General Piping.

C. Shop Drawings:
   1. Describe materials, pipe, fittings, gaskets, and solvent cement.
   2. Installation instructions.

1.05 QUALITY ASSURANCE

A. Plastic pipe in potable water applications: Provide pipe and tubing bearing NSF seal.

B. Fusion machine technician qualifications: 1-year experience in the installation of similar PE piping systems from the same manufacturer.

C. Mark plastic pipe with nominal size, type, class, schedule, or pressure rating, manufacturer and all markings required in accordance with ASTM and AWWA standards.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect piping materials from sunlight, scoring, and distortion.

B. Do not allow surface temperatures on pipe and fittings to exceed 120 degrees Fahrenheit.

C. Store and handle PE pipe and fittings as recommended by manufacturer in published instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Extruding and molding material: Virgin material containing no scrap, regrind, or rework material except where permitted in the referenced standards.

B. Fittings: Same material as the pipe and of equal or greater pressure rating, except that fittings used in drain, waste, and vent (DWV) piping systems need not be pressure rated:
   1. The definition of DWV piping systems on this project shall be limited to piping associated with toilets and sinks only.

C. Unions 2-1/2 inches and smaller: Socket end screwed unions. Make unions 3 inches and larger of socket flanges with 1/8-inch full-face soft EPDM gasket.

2.02 PVC PIPING, SCHEDULE TYPE

A. Materials:
   1. PVC Pipe: Designation PVC 1120 in accordance with ASTM D1785 and appendices:
      a. Pipe and fittings: Extruded from Type I, Grade 1, Class 12454-B material in accordance with ASTM D1784.
      b. PVC Pipe: Schedule 80 unless otherwise indicated on the Drawings or specified in the Piping Schedule in Section 15052 - Common Work Results for General Piping.
   2. Fittings:
      a. Supplied by pipe manufacturer.
      b. Pressure fittings: In accordance with ASTM D2466 or ASTM D2467.
      c. DWV fittings: In accordance with ASTM D2665.
   3. Solvent cement: In accordance with ASTM D2564:
      a. Manufacturers: The following or approved equal:
         1) IPS Corporation.
      b. Certified by the manufacturer for the service of the pipe.
      c. In potable water applications: Provide solvent cement listed by NSF 61 for potable water applications.
      d. Primer: As recommended by the solvent cement manufacturer.
      e. Chemical service: For CPVC or PVC pipe in chemical service, provide the following primer and cement, or approved equal:
         1) Primer: IPS Corp Type P70.
         2) Cement: IPS Corp Type 724 cement or another cement certified by the manufacturer for chemical service.
   4. Coating:
      a. Coat exposed piping as specified in Section 09960 - High-Performance Coatings.

2.03 PVC PIPING, CLASS TYPE

A. PVC pipe, Class Type: In accordance with AWWA C900:
   1. Pressure Class: 150 with a minimum DR of 18.
   2. Fittings: AWWA C900, DR18.
   3. Joint design: Push-on or mechanical joint type as identified in Piping Schedule.
   4. Gaskets: Neoprene in accordance with ASTM D1869 or ASTM F477.

2.04 CPVC PIPING

A. Materials:
   1. CPVC pipe: Schedule 40 or Schedule 80, as specified in the Piping Schedule in Section 15052 - Common Work Results for General Piping, in accordance with ASTM F441 and Appendix, CPVC 4120:
      a. Pipe: Extruded from Corzan Type IV, Grade 1, Class 24448 for sizes 8-inch and below and Class 23447 for sizes 8-inch and above material in accordance with ASTM D1784.
      b. Manufacturers: One of the following:
         1) IPEX USA, LLC.
         2) GF Harvel.

2. Fittings: In accordance with ASTM F438 or ASTM F439 for pressure fittings, as appropriate to the service and pressure requirement:
    a. Fittings: Supplied by the pipe manufacturer.
    b. Manufacturers: One of the following:
        1) IPEX USA, LLC.
        2) Chemtrol.
3. Solvent cement: In accordance with ASTM F493:
    a. Manufacturers: The following or approved equal:
        1) IPS Corporation.
    b. Certified by the manufacturer for the service of the pipe.
    c. Primer: As recommended by the solvent cement manufacturer.
    d. In potable water applications: Provide solvent cement listed by NSF 61 for potable water applications.
    e. For CPVC pipe in chemical service, provide the following primer and cement, or approved equal:
        1) Primer: IPS Corp Type P70.
        2) Cement: IPS Corp Type 724 cement or another cement certified by the manufacturer for high strength hypochlorite service.
    f. Contractor to submit solvent cement and primer selections prior to use.
4. Coating:
    a. Coat exposed piping as specified in Section 09960 - High-Performance Coatings.

2.05 PP PIPING

A. Materials:
1. Pipe: Schedule 40 dimensions, extruded from Type I-19509 material in accordance with ASTM D4101.
2. Fittings: Molded from the same material and same laying length in accordance with ASME B 16.12:
    a. Fittings: Manufactured by pipe manufacturer.
3. Coating:
    a. Coat exposed piping as specified in Section 09960 - High-Performance Coatings.

2.06 PE TUBING AND FITTINGS

A. Materials:
1. Small bore PE tubing: Black flexible virgin PE tubing, OD copper tubing size:
    a. Plastic tubing ID as follows:
        1) For NS 1/4 inch, ID of 0.170 inch.
        2) For NS 5/16 inch, ID of 0.187 inch.
        3) For NS 3/8 inch, ID of 0.251 inch.
        4) For NS of 1/2 inch, an ID of 0.375 inch.
2. Fittings: Compression fittings, Dekoron E-Z, or approved equal.
3. Protective sheath:
    a. Manufacturers: One of the following:
        1) Dekoron, "Poly-Cor."
        2) Parker Hannifin Corp./Fluid connector Products, Parflex® Division, Multitube.
4. Plug-in fittings for connection to instruments: Brass quick-connect fittings.

2.07 POLYETHYLENE PIPING FOR DRAIN, WASTE, AND VENT PIPING SYSTEMS

A. General:
   1. Pipe and fittings: High-density polyethylene.
   2. Dimensions of pipe and fittings: Based on controlled outside diameter in accordance with ASTM F714:
      a. SDR: Maximum of 11.

B. Manufacturers: One of the following:
   1. DuPont™, Sclairpipe®.
   2. Polaris, Dura-Tuff, Inc.

C. Pipe, fittings, and adapters: Furnished by the same manufacturer, and compatible with components in the same system and with components of other systems to which connected.

D. Materials:
   1. Polyethylene: In accordance with ASTM D1248, Type III, Class C, Category 5, Grade P34; listed by the Plastic Pipe Institute under the designation PE 3408; and have a minimum cell classification, in accordance with ASTM D3350.
   2. Pipe and fittings: Manufactured from material with the same cell classification.

E. Coating:
   1. Coat exposed piping as specified in Section 09960 - High-Performance Coatings.

2.08 SOURCE QUALITY CONTROL

A. PVC piping, Schedule Type:
   1. Mark pipe and fittings in accordance with ASTM D1785.

B. PVC piping, Class Type:
   1. Hydrostatic proof testing in accordance with AWWA C900: Test pipe and integral bell to withstand, without failure, two times the pressure class of the pipe for a minimum of 5 seconds.

C. CPVC piping:
   1. Mark pipe and fittings in accordance with ASTM F441.

D. PP piping:
   1. Test samples and testing: Cut test samples of pipe, 6 inches long, from full length sections and test by the method outlined in accordance with ASTM D2412:
      a. Deflect pipe at least 35 percent without failure. Stiffness at 5 percent deflection equals or exceeds 55 pounds per square inch after the test samples have been immersed in a 5 percent solution by weight of sulfuric acid and n-Heptane for a period of 24 hours prior to testing.
      b. Failure is defined as rupture of the pipe wall.
      c. Stiffness factor may be computed by the method outlined in accordance with ASTM D2412 or by dividing the load in pounds per linear inch by the deflection in inches and 5 percent deflection.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:
   1. Where not otherwise specified, install piping in accordance with ASTM F645, or manufacturer's published instructions for installation of piping, as applicable to the particular type of piping.
   2. Provide molded transition fittings for transitions from plastic to metal or IPS pipe. Do not thread plastic pipe.
   3. Locate unions where indicated on the Drawings, and elsewhere where required for adequate access and assembly of the piping system.
   4. Provide serrated nipples for transition from plastic pipe to rubber hose.

B. Installation of PVC piping, Schedule Type:
   1. Solvent weld joints in accordance with ASTM D2855:
      a. For PVC pipe in chemical service use IPS Corp. Type 724 cement and IPS Corp. Type P70 primer in accordance with manufacturer's instructions.
   2. Install piping in accordance with manufacturer's published instructions.

C. Installation of PVC piping, Class Type:
   1. Install piping in accordance with the Appendix of AWWA C900 complemented with manufacturer's published instructions.

D. Installation of CPVC piping:
   1. Clean dirt and moisture from pipe and fittings.
   2. Bevel pipe ends in accordance with manufacturer's instructions with chamfering tool or file. Remove burrs.
   3. Use solvent cement and primer formulated for CPVC:
      a. For CPVC pipe in chemical service use IPS Corp. Type 724 cement and IPS Corp. Type P70 primer in accordance with manufacturer's instructions.
   4. Use primer on pressure and non-pressure joints.
   5. Do not solvent weld joints when ambient temperatures are below 40 degrees F or above 90 degrees F unless solvent cements specially formulated for these conditions are utilized.

E. Installation of PP piping:
   1. Install piping in accordance with manufacturer's published instructions.

F. Installation of polyethylene (PE) tubing and fittings:
   1. Install small bore PE tubing in accordance with manufacturer's printed instructions, in neat straight lines, supported at close enough intervals to avoid sagging, and in continuous runs wherever possible.
   2. Bundle tubing in groups of parallel tubes within protective sheath.
   3. Tubes within protective sheath may be color coded, but protect tubing other than black outside the sheath by wrapping with black plastic electrician's tape.
   4. Grade tubing connected to meters in one direction.

G. Installation of PE piping for drain, waste, and vent:
   1. Install piping as recommended in manufacturer's published instructions.

3.02 FIELD QUALITY CONTROL

A. Test pipe as specified in Section 15052 - Common Work Results for General Piping and Section 15956 - Piping Systems Testing.

B. Leakage test for PVC piping, Class Type:
   1. Polyvinyl chloride (PVC) piping, Class Type: Subject to visible leaks test and to pressure test with maximum leakage allowance, as specified in Section 15956 - Piping Systems Testing.
   2. Pressure test with maximum leakage allowance: Perform test after backfilling:
      a. Pressure: 125 pounds per square inch, gauge.
      b. Maximum leakage allowance as follows, wherein the value for leakage is in gallons per 100 joints per hour:

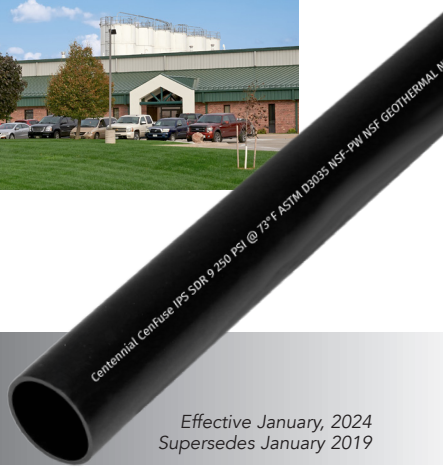
NPS, Inches	**1-1/2**	**2**	**2-1/2**	**3**	**4**	**6**	**8**	**10**	**12**
Leakage	0.41	0.52	0.63	0.76	0.98	1.45	1.88	2.35	2.80

END OF SECTION

PRODUCT DATA

Centennial® PLASTICS, INC.

centennialplastics.com



CenFuse

Flexible Polyethylene Pipe

HDPE 4710 – ASTM D3035 & ASTM F714

Certifiefd and Listed NSF

BACKED BY A 50 YEAR WARRANTY

Effective January, 2024
Supersedes January 2019

ASTM D3035			DR 7	DR9	DR 11	DR 13.5	DR 15.5	DR 17
Dimensions	**OD**	**DR**	**335 PSI**	**250 PSI**	**200 PSI**	**160 PSI**	**138 PSI**	**125 PSI**
3/4"	1.050	**ID** (in)	0.750	0.816	0.860	0.894	0.914	0.926
		Min Wall (in)	0.150	0.117	0.095	0.078	0.068	0.062
		Wt/Ft (lbs)	0.181	0.146	0.122	0.102	0.098	0.082
1"	1.315	**ID** (in)	0.939	1.023	1.075	1.121	1.145	1.161
		Min Wall (in)	0.188	0.146	0.120	0.097	0.085	0.077
		Wt/Ft (lbs)	0.285	0.229	0.191	0.159	0.151	0.128
1¼"	1.660	**ID** (in)	1.186	1.292	1.358	1.414	1.446	1.464
		Min Wall (in)	0.237	0.184	0.151	0.123	0.107	0.098
		Wt/Ft (lbs)	0.453	0.365	0.306	0.254	0.223	0.206
1½"	1.900	**ID** (in)	1.358	1.478	1.554	1.618	1.654	1.676
		Min Wall (in)	0.271	0.211	0.173	0.141	0.123	0.112
		Wt/Ft (lbs)	0.593	0.479	0.402	0.333	0.294	0.269
2"	2.375	**ID** (in)	1.697	1.847	1.943	2.023	2.069	2.095
		Min Wall (in)	0.339	0264	0.216	0.176	0.153	0.140
		Wt/Ft (lbs)	0.928	0.749	0.627	0.520	0.457	0.421
3"	3.500	**ID** (in)	2.500	2.722	2.864	2.982	3.048	3.088
		Min Wall (in)	0.500	0.389	0.318	0.259	0.226	0.206
		Wt/Ft (lbs)	2.016	1.626	1.360	1.128	0.994	0.912

CENTENNIAL CenFuse IPS SDR 9 250PSI @ 73°F ASTM D3035 NSF-pw NSF geothermal AWWA C901 NSF358 PE4710 CC3

ASTM F714			DR 7	DR9	DR 11	DR 13.5	DR 15.5	DR 17
Dimensions	**OD**	**DR**	**335 PSI**	**250 PSI**	**200 PSI**	**160 PSI**	**138 PSI**	**125 PSI**
4"	4.500	**ID** (in)	3.214	3.500	3.682	3.834	3.920	3.970
		Min Wall (in)	0.643	0.500	0.409	0.333	0.290	0.265
		Wt/Ft (lbs)	3.402	2.688	2.249	1.865	1.641	1.506
6"	6.625	**ID** (in)	—	5.153	5.421	5.643	5.771	5.845
		Min Wall (in)	—	0.736	0.602	0.491	0.427	0.390
		Wt/Ft (lbs)	—	5.961	4.873	4.048	3.557	3.268
8"	8.625	**ID** (in)	—	—	7.057	7.347	7.513	7.611
		Min Wall (in)	—	—	0.784	0.639	0.556	0.507
		Wt/Ft (lbs)	—	—	8.263	7.035	6.043	5.535

CENTENNIAL CenFuse IPS SDR 9 250PSI @ 73°F ASTM F714 NSF-pw NSF geothermal AWWA C906 NSF358 PE4710 CC3

Note: *For stocking coil lengths, please see centennialplastics.com*

DR 9 *= Water Service Pipe AWWA C901 & C906 Black with Blue stripe CC3*

AMTIVO ISO 9001:2015 Certified Quality Management

INDEPENDENTLY CERTIFIED NSF

Meets Buy America Act requirements.

PPI Plastics Pipe Institute The Voice of an Industry.

Scan here to learn more about our Geothermal Pipe

ESSENTIAL LINKS *(click link for website or to download file)*

- **PE Handbook**
- **Plastic Pipe Design Calculator**
- **Temperature Effects on Centennial Poly (HDPE App)**
- **CenFuse Stocking Coil Lengths**
- **Chemical Resistance of Plastic Piping Materials**
- **Weatherability of Thermoplastic Piping Systems**

Dimension Ration, DR	Min Cold Bend Radious
7, 9	20 x Pipe OD
11, 13.5	25 x Pipe OD
15.5, 17	27 x Pipe OD

CERTIFICATIONS & REFERENCES

- **Centennial CenFuse Polyethylene Pipe** is compatible for connections with butt fusion, socket fusion, electrofusion, compression fittings, and victaulic grooved fittings. Check with fitting manufacturers for proper installation.
- **CenFuse DR 9 and 7 meet AWWA C901** requirements in 3/4"– 3" and **AWWA C906** requirements in 4"- 6". CenFuse is certified and tested by NSF/ANSI standard 61 for potable water contact and NSF 14 for product performance compliance.
- **NSF/ANSI/CAN 61 —** Drinking Water System Components-Health Effects establishes the benchmark criteria for evaluating health effects of many drinking water system components, including plastic piping. Includes annual monitoring testing to verify continuous compliance, regular unannounced inspections of the manufacturing location, and ensures pipe is suitable for drinking water.
- **NSF/ANSI 14 —** Plastics Piping System Components and Related Materials establishes the physical, performance and health effects requirements for plastics piping system components and related materials. Includes annual monitoring testing to verify continuous compliance, regular unannounced inspections of the manufacturing location, and testing to product standards such as ASTM for dimensions, burst, sustained pressure, crush, extrusion quality, etc. Along with verification of the pipe material's long-term strength rating and material physical properties.
- **ASTM D3035 —** This specification covers polyethylene (PE) pipe made in thermoplastic pipe dimension ratios based on outside diameter IPS 3/4 to 3, for both non-pressure and pressure rated water. Included are requirements for polyethylene compounds and PE plastic pipe, a system of nomenclature for PE plastic pipe, and requirements and test methods for materials, workmanship, dimensions, sustained pressure, and burst pressure.
- **ASTM F714 —** This specification covers polyethylene (PE) pipe 4" and larger.
- **PE4710 —** CenFuse is manufactured from virgin high density polyethylene resin with the cell classification of 445576C per ASTM D3350-22. The material contains minimum 2% carbon black as a UV inhibitor to accommodate outside storage for at least 18 months
- **ASTM D3350 —** Material shall be high-density polyethylene conforming to the minimum requirements of cell classification 445576C. DR 9 or 250 psi related pipe will be listed CC3.
- **ASTM F2620 —** Heat fusion joining an PPI TR-33/R-41.
- **AWWA C901 —** This standard describes polyethylene (PE) pressure pipe and tubing made from material having standard PE code designation PE4710 and intended for use in potable water, reclaimed water, and wastewater service. Conforms to the OD dimensions of copper tube size (CTS) and iron pipe size (IPS). Pipe sizes 3" and smaller.
- **AWWA C906 —** This standard describes polyethylene (PE) pressure pipe and fittings made from materials conforming to standard PE materials designation codes PE 2606, PE 2706, PE 2708, PE 3608, PE 3708, PE 3710, PE 4608, PE 4708, and PE 4710. HDPE 4" and larger
- **CenFuse** is certified to NSF/ANSI 372 and conforms with the "lead free" plumbing as defined by California, Vermont, Maryland, and Lousiana state laws and the U.S. Safe Drinking Water Act.
- **Build America, Buy America (BABA Act) —** We proudly hold a BABA Act certification.
- **Centennial Plastics follows Proposition 65 – www.P65Warnings.ca.gov**
  Our products in their finished form do not require a California Proposition 65 warning label.

centennialplastics.com

Centennial® PLASTICS, INC.

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10/24

Product Description and Print Line

CenFuse HDPE 4710 Polyethylene Pipe

Material:

All CenFuse HDPE 4710 pipe is manufactured from virgin high density polyethylene resin with the cell classification of 445576C per ASTM D 3350. The material contains a minimum 2% Carbon Black as a UV inhibitor to accommodate outside storage.

Print Line:

All CenFuse HDPE 4710 is permanently indent printed with white print stating the following:

1. Identification of Centennial Plastics as the manufacturer.
2. The appropriate SDR, SIDR and/or CTS designation and nominal diameter.
3. Product trade name.
4. All relevant ASTM standards to which CenFuse is manufactured.
5. Relevant NSF and AWWA standards.
6. Manufacturing dates using the Julian calendar.
7. Incremental footage marking every two feet.
8. Design temperature rating.
9. Production shift designation.
10. Identification of PE 4710 high density resin.

Recommended Usage:

CenFuse HDPE 4710 is recommended for use as the piping material for all golf irrigation, mining and industrial, oil and gas, and stock water applications requiring controlled outside diameter pipe.

Connections:

CenFuse HDPE 4710 is manufactured to accommodate heat fusion. CenFuse may be heat fused either by butt fusion, socket fusion or electrofusion with any HDPE 3608/4710 fittings, providing the fittings and the pipe have the identical SDR. Any mechanical fittings manufactured to the appropriate SDR may be used.

Handling:

Any handling of the pipe shall avoid contact with sharp edged objects. If stored outside for long periods of time, the pipe should be covered with a UV resistant tarp or cover. If the wall of the pipe is penetrated by more than 10% of its thickness, the damaged pipe should be cut out, disposed of and replaced.

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CENFUSE 4710
HDPE MATERIAL DATA SHEET

CENFUSE 4710 HDPE MEETS OR EXCEEDS:
ASTM D 3035
ASTM D 3350, CELL CLASSIFICATION PE 445576C

CENFUSE 4710 PIPE FOR:
GEOTHERMAL, GROUND SOURCE HEAT PUMP APPLICATIONS.

NOMINAL PIPE PROPERTIES

	ASTM METHOD	ENGLISH UNITS	SI UNITS
DENSITY (BLACK)	D 4883	-	.959 g/cc
MELT INDEX [1]	D 1238	-	8.5 g/10 min
HYDROSTATIC DESIGN BASIS @ (23° C)	D 2837	1600 psi	11.0 MPa
HYDROSTATIC DESIGN BASIS @ (60° C)	D 2837	1000 psi	6.9 MPa
CARBON BLACK CONCENTRATION	D 1603	2.30%	2.30%

NOMINAL RAW MATERIAL PROPERTIES

TENSILE STRENGTH			
@ YIELD (2 in/min)	D 638	3625 psi	25.0 MPa
@ BREAK (2 in/min)	D 638	5500 psi	38.0 MPa
ELONGATION			
@ BREAK (2 in/min)	D 638	>600%	>600%
FLEXURAL MODULUS [2]	D 790	150,000 psi	1,035 MPa
NOTCHED IZOD IMPACT STRENGTH	D 256	9.0 ft-lbf/in	0.49 kJ/m
HARDNESS (SHORE D)	D 2240	66	66
VICAT SOFTENING POINT	D 1525	259° F	126° C
BRITTLENESS TEMPERATURE	D 746	<-180° F	<-118° C
ENVIRONMENTAL STRESS CRACK RESISTANCE [3]	D 1693	>5000 hrs.	>5000 hrs.
NOTCH TENSILE (PENT)	F 1473	>10,000 hrs.	>10,000 hrs.
CELL CLASSIFICATION	D 3350	445576C	445576C

[1] 190°C21600 g

[2] 2% Secant-Method 1

[3] Condition C

Centennial Plastics is an ISO 9001 certified company.
CenFuse is certified by NSF.
CenFuse meets AWWA C901 and C906 Requirements.
CenFuse HDPE 4710 is certified by NSF Standards 14 and 61.

Available in Size 3/4" - 8"
SDR 9 - 17.

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