

# Plastic Pipe Product Panel

CHAIR: Dave Meggers, Kansas DOT

VICE-CHAIR: Tom Baker, Washington State DOT

1. Call to Order
2. Attendance (See Attachment #1)
3. Work Plan (See Attachment #2)
4. Adjourn

# Attachment #1

## NTPEP ATTENDANCE LOG

PROJECT PANEL: Plastic Pipe      DATE/TIME: May 2006  
 CHAIR: Dave Meggers, Kansas DOT  
 VICE-CHAIR: Tom Baker, Washington State DOT

NAME	ORGANIZATION	E-mail	Phone	MEMBER
Dave Megger	Kansas DOT			Y
Tom Baker	WSDOT	<a href="mailto:Bakert@wsdot.wa.gov">Bakert@wsdot.wa.gov</a>	360-709-5401	Y
Michael Rafalowski	FHWA	<a href="mailto:Michael.Rafalowski@fhwa.gov">Michael.Rafalowski@fhwa.gov</a>	202-366-1571	N
Craig Graham	Vermont AOT	<a href="mailto:Craig.graham@state.vt.us">Craig.graham@state.vt.us</a>	802-828-6920	N
Richard "Nick" Nicholson	GA / Quikrete	<a href="mailto:rrnicholson@quikrete.com">rrnicholson@quikrete.com</a>	404-926-3181	N
Butch Bolling	ALDOT	<a href="mailto:bollingb@dot.state.al.us">bollingb@dot.state.al.us</a>	334-206-2341	N
Doug Gayne	Maine DOT	<a href="mailto:Doug.gayne@maine.gov">Doug.gayne@maine.gov</a>	207-624-3268	N
Omar Qudus	NDOR	<a href="mailto:oqudus@dor.state.ne.us">oqudus@dor.state.ne.us</a>	402-479-4394	N
Jim McConnell	ACO Polymer Products	<a href="mailto:jmconne@aco-online.com">jmconne@aco-online.com</a>	440-285-7000	N
Francis Manning	Rhode Island DOT	<a href="mailto:fmanning@dot.state.ri.us">fmanning@dot.state.ri.us</a>	901-222-3030	N
Joe Putherickal	Iowa DOT	<a href="mailto:Joseph.putherickal@dot.iowa.gov">Joseph.putherickal@dot.iowa.gov</a>	515-239-1259	N
Bill Brown	Lane Enterprises	<a href="mailto:wbrown@lane_enterprises.com">wbrown@lane_enterprises.com</a>	410-658-9991	N
Brian Colletti	Lane Enterprises	<a href="mailto:bcollett@lane-enterprises.com">bcollett@lane-enterprises.com</a>	717-761-8125	N
Edward Reasner	PENNDOT	<a href="mailto:ereasner@state.pa.us">ereasner@state.pa.us</a>	717-783-2559	N
Tony Allen	WSDOT	<a href="mailto:allent@wsdot.wa.gov">allent@wsdot.wa.gov</a>	360-709-5450	N
Jay Goldbaum	Colorado DOT	<a href="mailto:Jay.goldbaum@dot.state.co.us">Jay.goldbaum@dot.state.co.us</a>	303-398-6561	N
Randy Pace	NCDOT	<a href="mailto:rpace@dot.state.nc.us">rpace@dot.state.nc.us</a>	919-733-7091	N
Edward Lucas	NYSDOT	<a href="mailto:elucas@dot.state.ny.us">elucas@dot.state.ny.us</a>	578-457-4590	Y
Jim Goddard	ADS	<a href="mailto:Jim.Goddard@ads-pipe.com">Jim.Goddard@ads-pipe.com</a>	614-658-0248	Y
Yonas Kebede	Formosa Plastics	<a href="mailto:ykebede@fpcusa.com">ykebede@fpcusa.com</a>	973-422-7778	N
Ross Mills	KY Transportation Cabinet	<a href="mailto:Ross.mills@ky.gov">Ross.mills@ky.gov</a>	502-564-3160	N
Greg Baryluk	ADS	<a href="mailto:Gregory.baryluk@ads-pipe.com">Gregory.baryluk@ads-pipe.com</a>	508-825-6096	N
Bob Slicker	ADS	<a href="mailto:Bob.slicker@ads-pipe.com">Bob.slicker@ads-pipe.com</a>	614-658-0250	N
Sam Allen	TRI/Environmental, Inc.	<a href="mailto:sallen@tri-env.com">sallen@tri-env.com</a>	512-263-2101	N
Jim McGraw	Mn/DOT	<a href="mailto:James.mcgraw@dot.state.mn.us">James.mcgraw@dot.state.mn.us</a>	651-779-5548	N
Waseem Fazal	Delaware DOT	<a href="mailto:Waseem.fazal@state.de.us">Waseem.fazal@state.de.us</a>	302-760-2551	Y

Bill Hawkins	BBA Fiberweb	<a href="mailto:bhawkins@bbafiberweb.com">bhawkins@bbafiberweb.com</a>	615-847-7132	N
Sam Frederick	NCDOT	<a href="mailto:sjfrederick@dot.state.nc.us">sjfrederick@dot.state.nc.us</a>	919-733-7091	N
Mostafa Momen	NCDOT	<a href="mailto:mhmomen@dot.state.nc.us">mhmomen@dot.state.nc.us</a>	919-733-7091	N
Mike Shea	MoDOT	<a href="mailto:Micheal.shea@modot.mo.gov">Micheal.shea@modot.mo.gov</a>	573-751-5422	N
Hesharg El-Boulaki	NCDOT	<a href="mailto:Hel-boulaki@dot.state.nc.us">Hel-boulaki@dot.state.nc.us</a>	919-379-4223	Y
John Vance	MSDOT	<a href="mailto:jvance@mdot.state.ms.us">jvance@mdot.state.ms.us</a>	601-359-7111	N
Celina Sumrall	MSDOT	<a href="mailto:csumrall@mdot.state.ms.us">csumrall@mdot.state.ms.us</a>	601-359-1755	Y
Patti Gambill	SCDOT	<a href="mailto:gambillps@scdot.org">gambillps@scdot.org</a>	803-737-6648	N
Peter Kemp	Wisconsin DOT	<a href="mailto:Peter.kemp@dot.state.wi.us">Peter.kemp@dot.state.wi.us</a>	608-246-7953	Y
Stephen Loop	Idaho Transportation Department	<a href="mailto:Steve.loop@idt.idaho.gov">Steve.loop@idt.idaho.gov</a>	208-334-8267	Y
Alan Rawson	NHDOT	<a href="mailto:arawson@dot.state.nh.us">arawson@dot.state.nh.us</a>	603-271-3151	Y

American Association of State Highway and Transportation Officials (AASHTO)

National Transportation Product Evaluation Program (NTPEP)

**Project Work Plan for Evaluation  
of HDPE Thermoplastic Pipe**

Proposed Revision, May 9, 2006

Notes:

For grandfathering: a product is grandfathered if the samples were taken with state oversight

**Program Purpose:**

- A. To provide complete testing of thermoplastic pipe products in accordance with the AASHTO Materials Specifications. State DOT materials laboratories are not generally equipped to conduct all of the tests referenced in the standards, and equipping all, or most, of the labs to do so would not be cost effective. Some of the test procedures are quite specialized and the equipment would not be useable for other products or materials.
- B. To provide for the auditing of thermoplastic pipe production quality control facilities and records. This verifies that satisfactory manufacturing quality control systems are in place and are being routinely followed.
- C. To provide a listing of pipe products, by diameter and manufacturer, tested to the requirements of the AASHTO Material Specifications (M 294 or M 252), and listing of plants producing under a satisfactory manufacturing quality control system. (Note: M 252 is smaller diameter HDPE pipe)
- D. The test results and associated audit findings reported through this program are provided to AASHTO member departments, as a central primary source of credible, reliable information. Member departments are encouraged to apply this information as they deem appropriate to their individual agency's requirements. The results may be used for product acceptance and/or quality assurance by individual member departments. If used for quality assurance, member departments may require certification of compliance with all material specification requirements, including testing dates, testing frequency and the facility/laboratory where the tests were conducted.

**Tests/Practices to be Included:**

- AASHTO M252 Standard Specification for Corrugated Polyethylene Drainage Pipe
- AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm Diameter
- ASTM D 638 Standard Test Method for Tensile Properties of Plastics
- ASTM D 790 Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulation Materials
- ASTM D 1238 Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

- ASTM D 1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique
- ASTM D 1603 Standard Test Method for Carbon Black in Olefin Plastics
- ASTM D 4218
- (NOTE: allow D1603 or D4218, but D4218 will be considered the definitive test in case of a conflict or dispute)
- ASTM D 1693 Standard Test Method [Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics](#)
- ASTM D 2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- ASTM D 2412 Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- ASTM D 2444 Standard Test Method for Determination of Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- ASTM D 3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- ASTM F 2136 Standard Test Method [for Notched, Constant Ligament-Stress \(NCLS\) Test to Determine Slow-Crack-Growth Resistance of HDPE Resins or HDPE Corrugated Pipe](#)

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Note: All ASTM test methods referenced herein, are copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959.

## **Introduction:**

The AASHTO NTPEP for Thermoplastic Pipe can be used as part of a comprehensive quality control / quality assurance program for thermoplastic pipe and the resin from which it is manufactured. Under this program the Manufacturer certifies that the thermoplastic pipe it produces meets or exceeds the requirements in AASHTO M 294 or M 252. The appropriate NTPEP testing, as well as inspection and review of the Manufacturer's manufacturing and test facilities, validate the Manufacturer's certification. The Manufacturer's quality control / quality assurance program shall be submitted for review and approval by NTPEP.

## **Overview of the Program:**

The NTPEP for Thermoplastic Pipe provides independent test data and qualifies both plants and products. In addition to independent product testing, the program includes the following unique elements:

- Consultant Manager – A third party hired to review submittals, coordinate auditing and testing, resolve failures and disputes, and manage posting/publication of results. These audits are prescheduled, conducted by the Consultant Manager, and open to all company personnel and DOT representatives.
- Master Audits – 2-day 3<sup>rd</sup> party audits that include both standard annual product and process audits, but also serve as opportunities to train plant QC personnel and DOT auditors on related issues. These audits are prescheduled, conducted by the Consultant Manager, and open to all company personnel and DOT representatives.
- DOT Audits - Standardized annual product and process audits.

The program also introduces the recognition of a manufacturer's thoroughly documented statistical process control program as a basis for less required independent verification testing. Finally, the program is mandatory for all M294 pipe/resin but optional to the manufacturer for M252 pipe.

Through the program, designated NTPEP test facilities test the Manufacturer's product(s) to verify compliance with the applicable standard. Additionally, NTPEP audits the manufacturer's in-plant quality control facilities and procedures. The Manufacturer agrees that the test and audit reports and other relevant information may be

used by the NTPEP for review and verification of compliance with this NTPEP work plan and the applicable AASHTO Specifications. If compliance is demonstrated, the NTPEP will list the product(s) and plant(s) in the NTPEP listing of evaluated products and reviewed facilities.

### **Participation:**

Any manufacturer of thermoplastic pipe as defined in AASHTO M 294M and/or M 252M may participate in the program to test one or more products or diameters under this program. All costs for participation in the program, including sample shipping and testing and other NTPEP auditing and administrative fees, are to be borne by the manufacturers, except for those costs associated with DOT personnel performing in-plant audits.

1. The pipe manufacturer will make formal submittal to the NTPEP to initiate initial facility auditing and product testing. One or more of the testing agencies or laboratories will do all testing.
2. Product certification requirements are outlined in the appropriate AASHTO specifications. Both pipe and resin compounds from which the pipe is made shall be tested. Only the finished pipe product will be listed by manufacturer, diameter, and product number or name.
3. Each unique corrugated or profile wall thermoplastic pipe product will be separately tested.
4. Only product samples obtained from independent third-party sampling will be qualified and only when accompanied by an audit report documenting that the pipe was made under an acceptable, functioning quality control program that complies with the manufacturer's Quality Systems Manual.

### **NTPEP Functions:**

1. The NTPEP for Thermoplastic Pipe is administered by a "Consultant Manager" who interacts with pipe manufacturers on behalf of the NTPEP.
2. So long as the Manufacturer complies with all of the requirements set forth in this NTPEP work plan, including having product independently sampled and tested and submitting to initial and annual third-party in-plant auditing, the Manufacturer's product(s) will be listed by NTPEP.
3. Testing will be consistent with the revised specification upon its publication by AASHTO.
4. Auditing will be carried out by NTPEP and volunteer member states as outlined in this work plan.

### **Quality Program and Performance Testing:**

The Manufacturer will prepare and maintain a written QC/QA program to ensure that the quality of products is in accordance with the requirements of the AASHTO Materials Specifications and this NTPEP program. (Note: add in requirements for the QC/QA program as an Appendix. Get ESC version from Alan Rawson). Each manufacturer should include elements that it considers necessary to assure that products meet the requirements of the standards and other quality criteria. The Manufacturer shall maintain records that will demonstrate traceability of the pipe to the resin. Pipe/Resin records and a copy of the quality program shall be available for review by the NTPEP, as well as, State DOTs and other agencies participating in the NTPEP.

### **Supplier reduction in sampling:**

Unless the supplier prefers to limit his exposure (or limit his qualification), one sample of each size of pipe being produced will be sampled the first year in the program.

(Any manufacturer that makes pipe that is promoted or marked as AASHTO compliant, that manufacturer must participate in and meet the requirements of the NTPEP workplan/program.) NOTE: this question should go to AASHTO management.

## **Product Qualification:**

1. Resin Qualification: The raw material for plastic pipe manufacturing is plastic “resin” pellets. Resin manufacturers will be required to issue certifications of analysis (C of A) for every “lot” of resin.
  - a. Single-stream Production Resins: If pipe is made from a single-stream resin, the resin shall have been independently tested and pre-qualified, and the resin manufacturer will be required to issue a C of A for each lot stating that the resin has been tested and meets M294/252 specification requirements or designated cell class and to furnish associated lot-specific density and MI test data. The pipe manufacturer shall have a resin QA testing program.
  - b. Resin Blends: If pipe is made from a blend of component resins, the manufacturer of each component resin will be required to issue a C of A for each lot stating that the resin has been tested and to furnish associated lot-specific density and MI test data. The pipe manufacturer shall have a resin MQC testing program in place that includes the testing of each resin blend lot for density and MI and have the means of conducting (in-house or contract lab) the remaining cell class and NCLS testing as specified in M294/252. Full cell class and NCLS testing shall be performed on all approved/certified resin blends at least quarterly. Additionally, the pipe manufacturer shall have the resin blend independently tested and pre-qualified based on a “recipe” with component percentage tolerances of no more than +/- 1.5% substantiated by independent testing.
  - c. Audit Sampling: The resin or resin blend being used for M294/252 pipe production at the time of the audit will be sampled by the auditors. If a resin blend is being used, the blend as well as each component will be sampled.
  
2. Manufacturer Qualification. The manufacturer must have an operational quality assurance and quality control (QA/QC) plan that meets all the requirements of M294/252. The QA/QC plan must be fully detailed in a Quality Systems Manual (QSM) that is submitted for review. Note: add new section, referring to an appendix; in the appendix, detail the requirements of the QSP as used by the ESC. Note: need section defining that the manufacturer’s QSM will be made available on a secure NTPEP website for viewing by states only (AASHTO members).

Note: Add statement that manufacturer must have a training program and once a year the manufacturer must have a “competency” exam (same as qualifying testers).

1. Initial Product and Process Evaluation As evidence that pipe meeting M294/252 specifications is being supplied from the first day of program participation, all pipe sizes will be independently tested initially. At the Administrator’s option, he can arrange to oversee testing of pipe samples in the manufacturer’s

laboratory, if inter-lab calibration of tests has been accomplished. Initial samples may be selected by the manufacturer.

Pipe styles tested within the previous 12 months through an independent QA program, including ESC, NTPEP, or PPI, will be accepted as pre-qualified.

### **Annual Inspection (Audit) of Manufacturing Facilities:**

1. General Audit Conditions. Departments of Transportation and Federal Agencies using the NTPEP listing have the right to:
  - a. Visit and inspect the manufacturing facilities of any Manufacturer participating in the program to assure compliance. These visits need not be announced.
  - b. Randomly select sample of product (or resin, or resin compound) for confirmation testing by the NTPEP participating test facilities. Such testing, above and beyond the basic program requirements, shall be at the DOT or Agency expense, *unless* the tested product(s) does not meet the specification requirements, in which case the manufacturer shall bear the cost of testing and any subsequent re-testing required. A product's failure to comply will result in removal from the NTPEP listing.
  - c. Disagreements regarding test results shall be handled by a review process wherein the product is tested at another laboratory in the program or is tested in a round-robin program including the manufacturer and two of the NTPEP test facilities.
  
2. Annual Auditing and Testing. Once initial plant and product qualification is established, regular independent auditing and testing will assure that the manufacturer is properly implementing his QA/QC Plan. Independent sampling and testing, as well as annual in-plant audits, will be required. Audits will be unannounced and include sampling of pipe from inventory, allowing for lot-specific auditing of the manufacturer's QC system implementation and comparison to independent test results. Resin will be sampled for independent testing from current production. If available, current pipe production will be measured/evaluated on-site for MQC properties, and a sufficient sample taken to test resin properties from finished product. Every plant will be audited every year by a DOT-lead team, with a Master audit being conducted within a 5 year period by the Administrator. At a minimum, all pipe styles and sizes must be sampled/tested within a 5-year period. Additionally, at least 2 pipe and 2 resin samples will be taken during each audit for independent testing unless the manufacturer has an integrated statistical process control program that includes QC sampling frequencies, in which case only 1 sample each of pipe and resin will be required at each audit. Split samples shall be taken from one of the originally sampled sticks or from another stick made during the same shift as a way to "calibrate" all testing labs to the independent lab. Similarly, an additional resin or resin blend sample of the originally sampled resin or blend will be secured at each plant audit for use as a split sample. If the manufacturer maintains an approved statistical process control (SPC) program, only one pipe style and one resin will be required per audit. If no approved SPC program is maintained, then two split samples of pipe and resin will be required. While the original pipe and resin samples are sent to the independent lab, the manufacturer will retain the pipe split sample for in-house testing. The split-sample resin may be returned to the resin manufacturer for testing if the pipe manufacturer is not able to perform the cell class and NCLS verification testing as specified in M294/252. If a resin blend is being used by the pipe manufacturer, the pipe manufacturer must have the capability of conducting the cell class and NCLS testing as specified in M294/252. All split sample test results shall be reported to the Administrator within 14 days. The Administrator will annually evaluate the split sample

results and report on testing proficiency. The manufacturers are to be encouraged to establish in-plant QC testing and continuous process control systems.

Testing and sampling frequency:

- For new manufacturer: one sample of each size they produce

For ongoing manufacturer:

- Test one split sample per year
- Test all sizes within a five-year window

### **Test Samples:**

Samples must be submitted to the designated laboratories by the independent, third-party auditors designated by the NTPEP in sufficient quantity to conduct all testing, along with:

1. information showing the manufacturer's name and description of product;
2. information demonstrating that the resin or resin compound used in the manufacture of the product meets the current AASHTO specification requirements;
3. a sample of the resin or resin compound in sufficient quantity to conduct the specified resin tests.

**Test Report:** Add an appendix to cover this and delete below.

The test report will include the following information. See page 7 of Work Plan for "Typical" report:

1. Manufacturer's Name and Address, including primary corporate person.
2. Product Identification:
  - a. Product Name
  - b. Product Series, model number, product number, diameter, and/or lot number or identification.
3. Product Description
4. Product Type (or Class)
5. Test Results (compared to minimum requirements)

#### AASHTO M252 (4" – 10")

Pipe Stiffness – select specimens according to ASTM D 2412; test according to M252 Sec. 9.1.;

Pipe Flattening – test according to M252 Sec. 9.2;

Elongation - test according to M252 Sec. 9.3;

Brittleness – test according to M252 Sec. 9.5 (and 7.9) – "similar to F405";

ESCR on Pipe – ASTM D 1693 except as modified in M252 Sec 9.4;

Low Temperature Flexibility - test according to M252 Sec. 9.6;

Joint Integrity - test according to M252 Sec. 9.8.1;

Dimensions:

Inside Diameter – test according to ASTM D 2122 or M252 Sec 9.7.1;

Length – test according to M252 Sec 9.7.2;

Perforations – test according to M252 Sec 9.7.3;

Wall Thickness – ASTM D 2122

Marking – M252 Sec. 11;

Workmanship – M252 Sec. 7.1.1 – 7.1.2.

Carbon Black Content – ASTM D1603

### AASHTO M294 (12" – 60")

Pipe Stiffness – select specimens according to ASTM D 2412; test according to M294 Sec. 9.1;

Pipe Flattening – test according to M294 Sec. 9.2;

Brittleness – ASTM D 2444 except as stated in M294 Sec. 9.3;

ESCR on Pipe – ASTM D 1693 except as modified in M294 Sec 9.4;

Joint Integrity - test according to M294 Sec. 9.6.1;

Dimensions:

    Inside Diameter – test according to ASTM D 2122 or M294 Sec 9.7.1;

    Length – test according to M294 Sec 9.7.2;

    Perforations – test according to M294 Sec 9.7.3;

    Wall Thickness – ASTM D 2122

Marking – M294 Sec. 11;

Workmanship – M294 Sec. 7.1.1 – 7.1.2.

Carbon Black Content – ASTM D1603

Resin: (as required by ASTM D3350)

Density – ASTM D1505 or alternative described in ASTM D 792;

Melt Index – ASTM D 1238, Condition 190/2.16

Flexural Modulus – ASTM D 790, Method 1, Procedure B

Tensile at Yield – ASTM D 638;

Slow Crack Growth – ASTM F 2136 except as modified in M294 Sec. 9.5.1;

Thermal Stability – DSC per ASTM D 3350, Sec. 6.3.

#### 6. Related documentation submitted by the manufacturer

### **Failures during Audits or Testing.**

Inevitably, there are times when the sampled pipe fails to meet one or more of the M294/252 specification requirements when independently tested or when the manufacturer is found, during an audit, to have neglected one or more aspects of the governing QA/QC Plan during manufacturing. While the manufacturer may request a retest, if sufficient sample is available, the burden will be on the manufacturer to identify the cause, document the resolution, and revise his QA/QC plan to assure future conformance. All results will be reported. Any retesting or re-auditing will be at the discretion of the Administrator and the associated costs will be borne by the manufacturer.

### **Public Notice.**

One of the primary reasons for an independent QA program is to instill confidence in the end-user and the general public that the materials being used for infrastructure construction are of sufficient quality and to facilitate use of product that has proven to be of sufficient quality. To this end the program will provide for public notice of M294/252 qualified companies, plants, and products via website postings, with official hard-copy reports issued to participating DOTs.

### **Modification of Qualified Products (Retest Requirements):**

When design changes are made in an NTPEP listed product, the Manufacturer shall notify the NTPEP. Any changes in manufacturing method, product weight, or pipe wall design shall be considered a design changes. This process also applies to changes in either resin or resin compounds, except that substitution of a PPI listed resin for another PPI listed resin is not considered a change in the product. (Note: Manufacturers will supply NTPEP will a copy of the PPI resin listing.)

Products may change over time as manufacturers improve their products and optimize their manufacturing processes. These changes must be shown to be consistent with the product's ability to satisfy the M294/252 specifications, for which it has already been qualified. The program requires pipe resulting from design changes to be independently sampled and tested.

**Disagreement.**

Should a disagreement arise between a manufacturer and the Administrator, a procedure for resolving the disagreement must be available. The merged program will rely on the NTPEP oversight committee to be the final arbiter of disputes.

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TYPICAL REPORT FORMAT

AASHTO NTPEP  
Corrugated Polyethylene Pipe Test Report  
Date: \_\_\_\_\_

Manufacturer: \_\_\_\_\_  
Corporate Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Corporate Contact: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Plant Name: \_\_\_\_\_  
Plant Designation Code: ?  
Plant Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Plant Contact: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_

Product NTPEP Number: \_\_\_\_\_ Product Description: Corrugated Polyethylene Pipe  
**Type: Type, Inside Diameter: \_\_\_\_\_ mm ( \_\_\_\_\_ in), Perforation Class:**

Resin Classification (per ASTM D 3350): 335400C.

Test Method - Description	Specification		Specification Limits	Test Results
	ASTM D	AASHTO M 294		
ASTM D 1505 – Resin Density	X		0.940 ≤ ≤ 0.955	
		X	0.948 ≤ ≤ 0.955	
ASTM D 1238 – Resin Melt Index	X	X*	0.15* ≤ < 0.4	
ASTM D 790 – Resin Flexural Modulus	X	X*	110000 ≤ < 160000*	
ASTM D 638 – Resin Tensile Strength at Yield	X	X*	3000 ≤ < 3500* psi	
ASTM F 2136 – Resin ESCR (via NCLS)	X	X	24 hrs ≤	
ASTM D 3350 – Resin Thermal Stability	X	X	220°C ≤	
ASTM D 1603 – Pipe Carbon Black	X		2% ≤	
		X	2 ≤ ≤ 5%	
AASHTO M 294 – Workmanship		X	No visible defects	pass / fail
ASTM D 2122 – Pipe Inside Diameter		X	≤ ≤ in	
ASTM D 2122 – Pipe Wall Thickness		X	in ≤	
AASHTO M 294 – Pipe Length		X	99% selling length ≤	pass / fail
ASTM D 2412 – Pipe Stiffness @ 5%		X	≥ psi @ 0° / 45° /	/ /
AASHTO M 294 – Pipe Flattening		X	no buckling, etc ≥	/ /
AASHTO M 294 – Pipe ESCR		X	no cracks	pass / fail
ASTM D 2444 – Pipe Brittleness		X	no cracks	pass / fail
AASHTO M 294 – Pipe “soil-tight” Joint Integrity		X	≤ 5mm separation @	pass / fail
AASHTO M 294 – Pipe Perforations		X	Nonperf; Type 1;	
AASHTO M 294 – Marking		X	full markings @ ≤	pass / fail

\* - higher class (exceeding specification limit) is acceptable; n/s – not sampled; n/a – not applicable

### **“General Notes”, Page 1 of 2**

(Instructions: Read these “General Notes”, sign acknowledgement on page 10, and return these “General Notes” with your completed application package.)

1. All materials and/or products to be tested will be furnished by the manufacturer/supplier at no cost to the NTPEP. Samples will be selected for testing by NTPEP or Department of Transportation personnel.
2. Manufacturers/suppliers will submit a Product Evaluation Form (PEF) for each sample product submitted for testing to the NTPEP Manager.
3. Manufacturers/suppliers shall attach a check payable to AASHTO for the amount indicated on the attached “Testing Fee Schedule” based upon the type or diameter of product and number of samples to be tested.

4. Incomplete, inaccurate and/or erroneous information furnished as part of the form could result in the material being rejected for testing.
5. A handling fee of 10% of the testing fee will be charged if a Product Evaluation Form (PEF) is withdrawn prior to the beginning of the testing process. Testing fees will not be refunded once the testing process has begun.
6. A manufacturer/supplier may elect to withdraw their product from the current test cycle with a written request to the NTPEP Manager at least five business days before the next test cycle begins. If the NTPEP Manager approves the request, then the test results will not appear in the product report with a statement that the product has been withdrawn from the program and no test results will be reported.
7. A non-interference policy is in effect in regard to manufacturer/supplier inquiry as to the performance of their product under evaluation. Following submission of the product report to the NTPEP Manager, the manufacturer/supplier will be given fourteen days to review their test data. This request for comments and review will be in writing. All comments on the Product Report shall be addressed to the NTPEP Manager, and sent to AASHTO Headquarters in Washington, DC.
8. AASHTO member departments may use the laboratory test data obtained from the products evaluated by NTPEP to establish their approved or qualified products lists.
9. The American Association of State Highway and Transportation Officials (AASHTO) will copyright the printed reports with ALL RIGHTS RESERVED. The report or parts thereof may not be reproduced in any form without written permission by AASHTO.
10. The manufacturer/supplier is hereby notified that the NTPEP reserves the right to release or distribute information included in or attached to the PEF, as well as the test results obtained as part of our field and laboratory procedures.
11. Appeals by the manufacturer/supplier, in regards to test results, will be done in accordance with the appeals process in the NTPEP Policies and Procedures.
12. Continuance of product and plant listing by AASHTO/ NTPEP requires on-going compliance with all elements of the program. Re-testing must be done if there is any significant change in the product composition, raw materials source (resin), and/or physical properties.
13. Participating manufacturer should be aware; AASHTO member departments may require state-level specifications that supersede NTPEP testing. Manufacturers are encouraged to be aware of these requirements, and to take proactive measures to satisfy them, outside the scope of NTPEP participation.

14. All testing shall be done at AASHTO-select laboratories/facilities, under contract with AASHTO/NTPEP. These labs currently include: Texas Research International, Austin, Texas; Ohio University, Athens, Ohio; and Utah State University, Logan, Utah.
15. All laboratories participating in the program shall submit a QC/QA plan, which will be kept on file with the NTPEP. Through written request, this document(s) will be made available for review by participating industry, and member departments.
16. Dependent upon sample load, participating manufacturer may elect to have their pipes tested by either Ohio University or Utah State University. Sampling of product will be done according to this NTPEP Work Plan, by NTPEP or state DOT inspectors.
17. A non-interference policy is in effect with regard to manufacturer inquiry, as to the performance of their product under evaluation. AASHTO-select labs are under contract with NTPEP with respect to ensuring confidentiality of “early test results”. Manufacturer/supplier may not contact any AASHTO-select lab to inquire about their “early test results”.
18. According to NTPEP bylaws, AASHTO members and participating manufacturers have access to “early test results” of NTPEP data. Information is made available by contacting the NTPEP Manager. Such requests must be made in writing. Whenever a member department requests “early test results”, the participation manufacturer is informed of the request.
19. Testing of new products or modified products shall be done on a quarterly testing cycle. Manufacturers may submit products on a “rolling basis”, throughout the year. Depending upon sample load, products submitted for NTPEP evaluation will be included in the next practicable available testing cycle.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

\_\_\_\_\_

SIGNATURE \_\_\_\_\_

TODAY'S DATE \_\_\_\_\_

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Mail check for the sum total of testing fees payable to "AASHTO/NTPEP". Mail to bank lock box addressed, simply:

AASHTO/NTPEP  
Dept. 5051  
Washington, D.C. 20061-5051

Send the completed Product Evaluation Form(s) (PEF), technical bulletins, product specifications, MSDS, other pertinent literature and instructions, and a copy of the check to:

AASHTO/NTPEP  
Attn.: Michael McGough, EIT  
444 North Capitol Street, NW, Suite 249  
Washington, D.C. 20001

