



Harvel LXT® Ultra-pure Water Piping

Application:

Intended for use in pressure piping systems for the conveyance of ultrapure water. IPS sizes 1/2" through 6", for use at ambient temperatures up to and including a maximum of 140 F. Pressure rating (140 psi to 420 psi) varies with pipe size, temperature, and component limitations as stated in the Harvel Plastics, Inc. Harvel LXT® product bulletin (HPB-114). Pipe exhibits excellent surface finish characteristics, good physical properties and exceptional low extractable qualities that reduce the potential for micro contamination in UPW applications.

Scope:

This specification outlines minimum requirements for Harvel LXT® Schedule 80-iron pipe size (IPS) UPW pressure pipe. This piping system is intended for use in ambient temperature ultrapure water systems where the fluid conveyed does not exceed 140F.

Materials:

The material used in the manufacture of pipe, fittings and valves shall be a specialty, virgin, low-extractable rigid polyvinyl chloride (PVC) compound (trade name Harvel LXT®), with a Cell Classification of 12343 per ASTM D1784. This specialty compound shall be translucent blue in color, and shall be approved by NSF International for use with potable water (NSF Standard 61). This material also complies with the provisions of Title 21 of the United States FDA Code of Federal Regulations as being safe for use in food contact applications. All Harvel LXT® raw material utilized for the production of pipe shall be procured, packaged, handled and stored utilizing controlled procedures to reduce the potential for external contamination. A record of each material lot shall be maintained for material identification and tracking. This material shall not contain lead stabilizers.

Pipe:

Harvel LXT® pipe shall be manufactured in strict accordance to the dimensional requirements of ASTM D1785 to Schedule 80 dimensions and tolerances. All pipe shall be extruded on dedicated equipment used for the production of Harvel LXT®. All pipe shall be continually monitored for dimensional tolerances and inspected for any visible scratches, bubbles, dirt, voids or other imperfections. All finished product shall be homogenous throughout, and shall be free of voids and foreign contamination. Each pipe length shall be purged with clean filtered air during production to remove shavings. All pipe shall be double bagged immediately after manufacture in FDA approved anti-static polyethylene sleeves that are heat-sealed upon final inspection. Each standard length of product shall be traceable to the raw material lot and batch from which it was produced. Each production run of pipe shall also meet or exceed the test requirements established by Harvel's Quality Assurance Program for materials, workmanship, burst pressure, flattening resistance, and extrusion quality.

Pipe Marking:

Pipe identification marking shall be provided on the exterior pipe surface at intervals not exceeding 5 feet in length. Marking identification shall include the material designation Harvel LXT®, pipe size, dimensions (Schedule 80) and production lot information for product traceability.



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SCHEDULE 80

Nom. Pipe Size (in.)	O.D.	Average I.D.	Min. Wall	Nom. Wt./Ft.	Max. W.P.
1/2	0.840	0.526	0.147	0.213	420
3/4	1.050	0.722	0.154	0.289	340
1	1.315	0.936	0.179	0.424	320
1-1/4	1.660	1.255	0.191	0.586	260
1-1/2	1.900	1.476	0.200	0.711	240
2	2.375	1.913	0.218	0.984	200
3	3.500	2.864	0.300	2.010	190
4	4.500	3.786	0.337	2.938	160
6	6.625	5.709	0.432	5.610	140

The pressure ratings given are for water, non-shock, @ 73° F. The following temperature de-rating factors are to be applied to the working pressure ratings (WP) listed when operating at elevated temperatures.

De-Rating Factor	
Operating Temp (°F)	De-Rating Factor
73	1.00
80	0.88
90	0.75
100	0.62
110	0.51
120	0.40
130	0.31
140	0.22

Multiply the working pressure rating of the selected pipe at 73° F, by the appropriate de-rating factor to determine the maximum working pressure rating of the pipe at the elevated temperature chosen.

Fittings & Valves:

All fittings and valves shall be manufactured from the same virgin, low extractable material as specified in the material section. All fittings shall be manufactured to Schedule 80 dimensions and tolerances in strict accordance to the dimensional requirements of ASTM D2467. Socket-style fittings shall have tapered sockets manufactured in accordance to the requirements of ASTM D2467 to create an interference type fit. Threaded fittings shall be manufactured in accordance with ASTM F1498 to tapered pipe thread dimensions. All fittings and valves shall be 100% visually inspected for cleanliness and imperfections as specified by the manufacturer. Upon final inspection, all fittings and valves are to be double bagged immediately in FDA approved anti-static polyethylene sleeves that are heat-sealed. All flanges shall have ANSI Class 150 bolt patterns, and carry a maximum pressure rating of 150 psi non-shock @ 73F.

All valves shall be true union Weir-style diaphragm or true union style quarter turn ball valves manufactured from the same virgin, low extractable material. All diaphragms and seats shall be PTFE; valve o-rings shall be EPDM or Viton as specified. All valve union nuts shall have buttress style threads. All valve components shall be replaceable. True union diaphragm valves sizes 1/2"-2" shall carry a maximum working pressure rating of 150 psi non-shock @ 73° F. True union ball valves sizes 1/2"-2" shall carry a maximum working pressure rating of 235 psi non-shock @ 73° F. True union ball valves sizes 3" & 4" shall carry a maximum working pressure rating of 150 psi non-shock @ 73° F.

Joining:

All Harvel LXT® UPW piping shall be joined utilizing Harvel LXT® One-Step UPW Grade Solvent Cement specifically formulated for joining this material. All solvent cemented welds shall be made-up in strict accordance with the written assembly procedures for the product as stated in the Harvel Plastics, Inc. Harvel LXT® product bulletin (HPB-114). Installers must become familiar with these procedures prior to assembly. The use of solvent cements and/or primers other than Harvel LXT® One-Step is not acceptable. Joint integrity on solvent welded connections shall be confirmed with visual inspection utilizing a light source to inspect the cemented surfaces for uniformity. All solvent cemented connections shall be allowed to set and cure properly prior to pressure testing/rinsing procedures per the joint cure schedules as stated in the Harvel Plastics, Inc. Harvel LXT® product bulletin (HPB-114).

Sample Specification:

UPW process piping and fittings shall be manufactured from a specialty low-extractable, Polyvinyl Chloride (PVC) compound with a Cell Classification of 12343 per ASTM D1784. All pipe and fittings shall be produced to Schedule 80 dimensions, manufactured in strict compliance to ASTM D1785 (pipe), and ASTM D2467 (fittings). These products shall carry a Type II pressure rating and consistently meet or exceed the applicable Quality Assurance test requirements of these standards with regard to dimensions, workmanship, burst pressure, flattening resistance and end product quality. All UPW process valves shall be True Union style diaphragm or True Union style quarter turn ball valves produced from the same low-extractable PVC compound. All valve diaphragms and seats shall be PTFE; valve o-rings shall be EPDM or Viton® as applicable. All valve union nuts shall have buttress style threads. All valve components shall be replaceable. System components shall be joined utilizing Harvel LXT® One-Step specialty solvent cement specifically formulated for joining the system. All system components shall be manufactured in the USA by an ISO certified manufacturer. All UPW piping shall be bagged and sealed immediately after manufacture to maintain cleanliness, boxed and stored indoors at the manufacturing facility until shipped from the factory. UPW process pipe, components and cement shall be that as provided by Harvel Plastics, Inc., trade name Harvel LXT®.