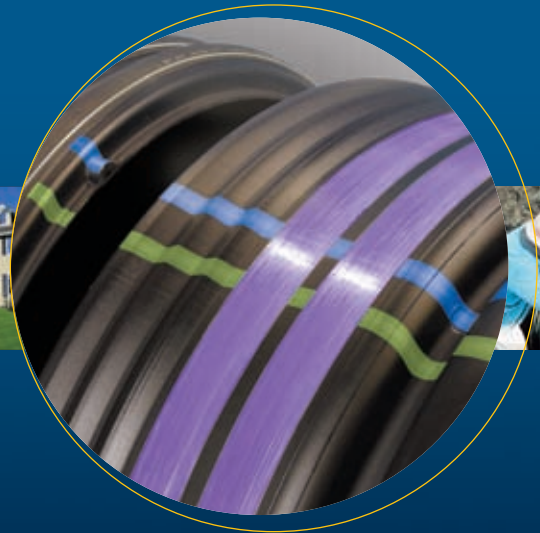


# LOW HEAD IRRIGATION PIPE



BLUE STRIPE: LEADING THE WAY.



## THE CHALLENGE OF BRINGING WATER TO THE WEST

Water resources are a major challenge in the Western United States. Population growth and frequent rainfall shortages have highlighted the need for improvement to an aging and inadequate water delivery infrastructure.

For generations, water distribution has been accomplished through irrigation canals and open earth ditches. However, the increased burden on the water system has highlighted its inefficiencies. In parts of the Southwest, water loss from evaporation is estimated at 100" per year. Couple that with infiltration loss, and the problem is even more significant.

While enclosing these canals with pipe is one way of conserving and stretching water supplies, the installation of pipe for irrigation water has been difficult and cost prohibitive due to inadequate, inappropriate or over-designed pipe.



**Increasing demands reveal the need for improvements**

### THE HANCOR SOLUTION

Hancor has developed an innovative, cost-effective pipe, designed to meet this growing need. Low Head Irrigation pipe is specifically designed to meet the needs of this challenging market through its:

- Structural performance
- Joint integrity
- Flow capacity
- Design flexibility
- Economy



**Hancor's innovative pipe design meets this growing need**

### BUILDING ON THE BLUE SEAL® BREAKTHROUGH

Hancor has brought the same technical excellence that led to such advances as single wall, Sure-Lok® bell-and-spigot, and BLUE SEAL® watertight pipe to the irrigation challenge.

Incorporating patented technology developed in the aerospace industry, BLUE SEAL pipe introduced two important design innovations:

1. The sealing area of the integral bell is reinforced with a proprietary 2" (50mm) polymer collar that improves the joint's integrity and dimensional stability.
2. A proprietary gasket design, engineered to maximize sealing surface and meeting ASTM F477 is factory-installed onto the spigot.

The result is a design that meets or exceeds ASTM F1417 or ASTM F2487 watertight field test requirements, and fills an essential role in complying with the more stringent demands of new EPA water quality guidelines.

## INTRODUCING THE NEXT GENERATION OF PERFORMANCE

Hancor’s new HDPE Low Head Irrigation pipe builds on the success of BLUE SEAL. We began by modifying the integral bell joint to better suit the irrigation market. Longer bells and spigots provide for increased joint offsets while maintaining watertight performance.

The bell is reinforced with multiple polymer bands, increasing sealing area and joint performance. The spigot has been designed with two gaskets to provide redundant sealing of the joint. These modifications provide a watertight flexible joint tailored to the low head irrigation market.

In addition to joint improvements, Hancor engineers designed a pipe capable of handling the pressure associated with low head irrigation. Low Head Irrigation pipe is extruded with a pressure-rated resin (PE 3408) in the liner portion of the pipe. This resin is the same as that used in high pressure gas transmission throughout the country. Although not required in traditional gravity flow non-pressure drainage applications, the addition of a pressure rated resin allows continuous pressure (up to 5 psi with surge pressures up to 10 psi) to be applied while maintaining long-term performance.



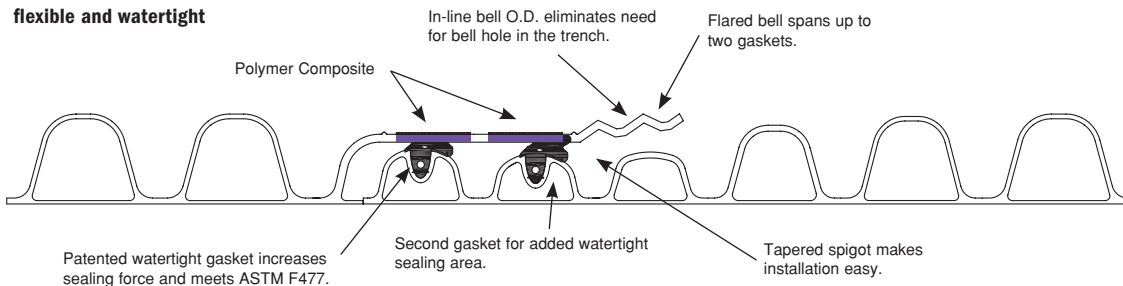
### LOWEST INSTALLED COST OF ANY LOW HEAD IRRIGATION PIPE

The material cost of HDPE pipe is extremely competitive with other low head transmission pipe materials. When installation costs are factored in, the savings begin to multiply:

- Polyethylene’s light weight cuts handling costs.
- Fewer people are needed for on-site unloading and handling.
- Heavy equipment requirements are reduced.
- Long lengths are easy to handle and require fewer joints.
- Bell-and-spigot joint design reduces labor time for assembly.

### APPLICATIONS

#### Integral bell-and-spigot joint, flexible and watertight



## THE HIGHEST STANDARDS IN DESIGN

Hancor Low Head Irrigation pipe can be specified for ditch enclosures for irrigation, irrigation pipe replacement, and other low head irrigation projects. The pipe is available in 30" (750mm) through 60" (1500mm) diameters, and meets or exceeds AASHTO M294, Type S or ASTM F2306 due to its HDB (pressure rated) resin and advanced connection design.

### STRUCTURAL PERFORMANCE

As a flexible conduit, HDPE pipe withstands vertical pressure by transferring most of the overhead load to the surrounding soil. Hancor Low Head Irrigation pipe will support H-25 live loads with a minimum of 12" of cover (24" for 60" pipe), an important consideration in low head pressure applications. Maximum cover will vary with design conditions, see fill height tables in technical note 2.0.1.

### DURABILITY

High density polyethylene is an extremely tough material that can easily withstand the normal impacts involved in shipping and installation. It is highly resistant to chemical attack, and is unaffected by soils or effluents with pH ranges of 1.5 to 14. HDPE's ductility and molecular structure result in excellent resistance to abrasion. Polyethylene pipe shows less than 20% of the material loss of concrete pipe in abrasive environments, and is often specified for harsh mine slurries and as a slip liner for deteriorated culverts.

### HYDRAULIC EFFICIENCY

The smooth interior of Hancor Low Head Irrigation pipe provides the superior flow characteristics that are essential for efficient transmission of water for irrigation. Hancor Low Head Irrigation pipe has a design Manning's coefficient of 0.012, which is among the most efficient in the industry.

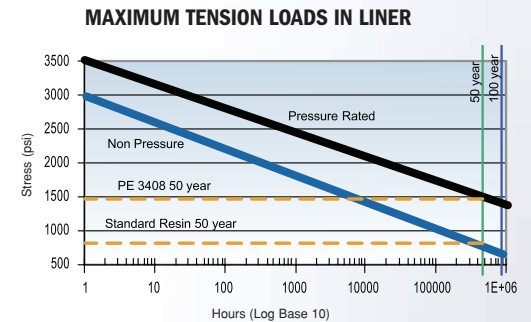
### LIGHT WEIGHT

HDPE pipe is up to 30 times lighter than traditional piping materials, making it far easier to transport and handle. On-site labor and equipment requirements are reduced, with a corresponding reduction in the risk of potential injury.

### FAST INSTALLATION

Long, 19' 8" (6m), lengths mean fewer joints. Joints are typically the weakest link in any low head irrigation system and should be minimized. Hancor Low Head Irrigation pipe joints are among the best on the market, with quick and easy push-together connections made possible with our integral gasketed bell-and-spigot design.

Hancor Low Head Irrigation pipe is the only pipe designed specifically for the low head



## THE PERFECT INTEGRATION OF ENGINEERING AND NEED

irrigation market.

- Longer bells and spigots for joint flexibility
- Multiple reinforcing wraps on bells for larger seating area
- Multiple gasket options
- Pressure rated interior liner
- Longer pipe lengths for fewer joints
- Proven toughness and durability
- Structural performance
- Hydraulic efficiency
- Light weight, easy to handle
- Fast installation
- Low installed cost

### INSTALLATION RECOMMENDATIONS

Proper installation is essential for the long-term performance of any pipe structure. The basic procedures for Hancor Low Head Irrigation pipe are very similar to the requirements of most other pipe products.

Hancor Low Head Irrigation pipe is a flexible conduit which transfers live and dead loads to the surrounding soil. Therefore, particular care is required in bedding, backfill, compaction, and the selection of backfill material. Class I or II soils may be used for backfill, and should be compacted to at least 90% Standard Proctor Density.

Instructions for installation of underground plastic drainage pipe are contained in ASTM D2321. Specific instructions for Hancor Low Head Irrigation pipe are detailed in Hancor's Corrugated HDPE Pipe Installation Guide.



# HANCOR LOW HEAD IRRIGATION PIPE SPECIFICATIONS

## SCOPE

This specification describes 24"-60" (600-1500 mm) Hancor Low Head Irrigation pipe for use in low head/low pressure applications.

## PIPE REQUIREMENTS

Hancor Low Head Irrigation pipe shall have a smooth interior and annular exterior corrugations.

- 24"-60" (600-1500 mm) shall meet AASHTO M294, Type S or ASTM F2306 with the modifications listed.
- Manning's "n" value for use in design shall be 0.012.
- Where low head applications sustain continuous pressure, the sustained pressure shall not exceed 5 psi and the peak pressure shall not exceed 10 psi.

## JOINT PERFORMANCE

The 24- through 60-inch (600 to 1500 mm) pipe shall be watertight according to the requirements of ASTM D3212. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. Integral bell shall be reinforced with multiple polymer wraps installed by the manufacturer. Spigot shall have two gaskets which can be fully inserted into the bell.

## FITTINGS

Fittings shall conform to AASHTO M294 or ASTM F2306. Fittings shall be fabricated from the same materials as the pipe.

## FIELD PIPE AND JOINT PERFORMANCE

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

## MATERIAL PROPERTIES

Virgin material for pipe and fitting production shall be high-density polyethylene conforming with the minimum requirements of cell classification 435400C for the corrugated exterior profile, and 445464A, for the interior liner as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The 24- through 60-inch (600 to 1500mm) virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Sections 9.5 and 5.1 of AASHTO M294 and ASTM F2306 respectively. The interior liner resin shall have a material designation code of PE3408 by the Plastic Pipe Institute and a Hydrostatic Design Basis of 1600 psi.

## INSTALLATION

Installation shall be in accordance with ASTM D2321 and Hancor published installation guidelines for low head irrigation pipe with the exceptions that only Class I and II backfill materials shall be acceptable and minimum cover in traffic areas for 24- through 48-inch (600 to 1200mm) shall be one foot (0.3m) and for 60-inch (1500mm) diameters, the minimum cover shall be 2-feet (0.6m). Contact your local Hancor representative or visit our website at [www.hancor.com](http://www.hancor.com) for a copy of the installation guidelines.

	Nominal Diameter, in (mm)					
<b>Pipe I.D. in.</b> (mm)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
<b>Pipe O.D. in.</b> (mm)	27.8 (719)	36 (914)	42 (1067)	48 (1219)	54 (1372)	67 (1702)
<b>Waterway thickness (t) in.</b> (mm)	0.07 (18)	0.07 (18)	0.095 (24)	0.105 (27)	0.105 (27)	0.105 (27)

\*Check with sales representative for availability by region and for exact dimensions. Dimensions are nominal and may vary slightly.

## DIRECT CONTACT

**Customer Service**  
888-FOR PIPE (367-7473)  
Fax 888-FAX PIPE (329-7473) 24 hours a day

## ELECTRONIC MEDIA

**Web Site**  
Find market- and application-specific information and the latest industry news at our On-Line Pipeline - [www.hancor.com](http://www.hancor.com)

Hancor "Terms and Conditions of Sale" are available on the Hancor web site, [www.hancor.com](http://www.hancor.com)