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CAST IRON

Applications, Products, Installation and Advantages

CAST IRON APPLICATIONS

- **Sanitary DWV**
- **Storm Drainage**
- **Non-Pressure Only**

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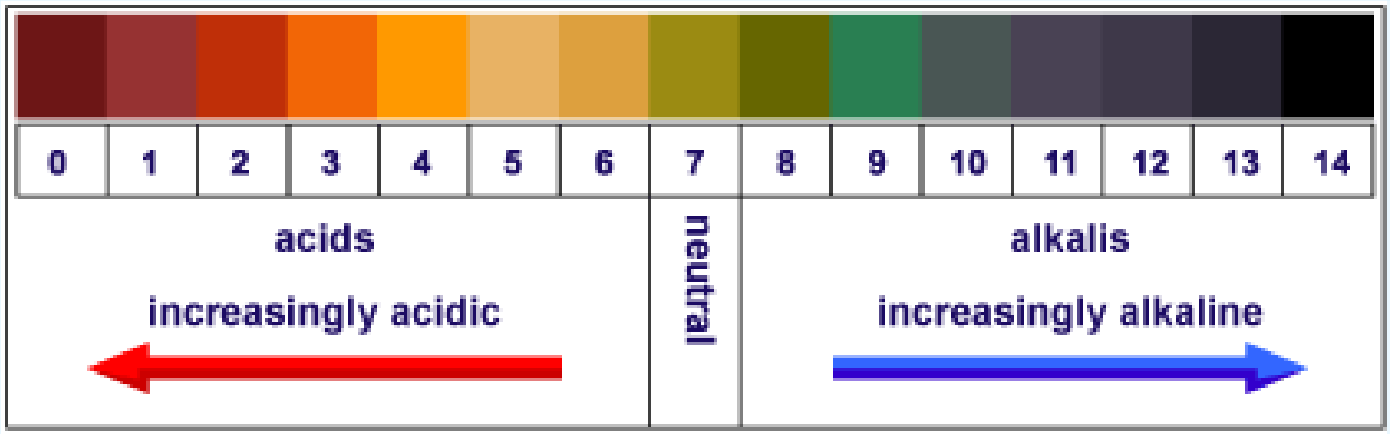
CAST IRON APPLICATIONS

Sanitary DWV and storm drainage applications usually involve discharge of liquids in a pH range of 5 to 8.

- **Cast Iron has the ability to convey liquids in a wide pH range from as low as 4.3 to as high as 10.**

- **Per code for discharge of corrosive liquids below a pH of 4.3 consider alternate materials including those designed for "Special" or chemical waste.**



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CAST IRON PRODUCTS

- **Hubless**
  - Only available in one weight
  - Commonly referred to as “No-Hub”

- **Hub and Spigot**
  - Service (SV)
  - Extra Heavy (XH)

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CAST IRON PRODUCTS

- **Service Weight Cast Iron System**
  - Sanitary Waste
  - 212° F max. (at zero psi.)
- **Extra Heavy Cast Iron System**
  - Sanitary Waste
  - 212° F max. (at zero psi.)
- **No-Hub Cast Iron System**
  - Sanitary Waste
  - 212° F max. (at zero psi.)

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CAST IRON PRODUCTS

Hub and Spigot:

Typically used below grade where ease of pulling joints together in trenches and close quarters is a real plus

Hubless:

Most often used above grade where compact size and ability to adjust fittings orientation during installation are important

- **The major codes allow either hub and spigot or hubless both above & below grade**

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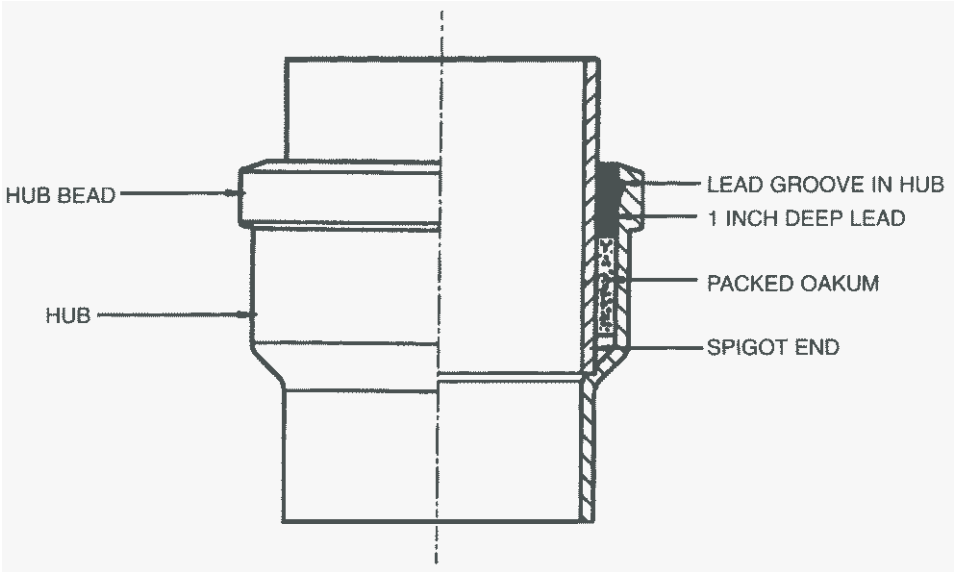
JOINING: LEAD & OAKUM, GASKETS AND COUPLINGS

- **Hub and spigot was originally joined using a hub tightly packed with a fiber known as “oakum” and sealed with molten lead**



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JOINING: LEAD & OAKUM, GASKETS AND COUPLINGS

- **Today hub and spigot is much more commonly assembled using compression gaskets.**

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JOINING: LEAD & OAKUM, GASKETS AND COUPLINGS

- **Hubless Couplings**

Charlotte Pipe and Foundry recommends that it's hubless pipe and fittings be assembled using couplings that either are:

- Standard couplings meeting CISPI 310 (ASTM C 1277)

OR **- "Heavy-Duty" couplings meeting ASTM C 1540**

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INSTALLATION: CUTTING CAST IRON SOIL PIPE

- **Abrasive (Chop) Saw**

- **Wheel Cutter**

- **Hammer and Chisel**

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INSTALLATION: CUTTING CAST IRON SOIL PIPE

- **Snap Cutter**

  - Abrasive cutters are especially useful for 8” and larger pipe but snap cutters are commonly used on smaller pipe sizes

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INSTALLATION: SNAP CUTTERS

- Always follow the instructions from the tool manufacturer.
- Measure carefully:

- Position the snap cutter so pipe will be cut square.
- Apply even pressure on the handles

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INSTALLATION: HUB & SPIGOT/COMPRESSION GASKETS

Charlotte Seal Gasket

- **Available for 2”-10” Service and 2”-15” Extra Heavy**

Quik-Tite Gasket

- **Available for 2”-12” Service and 4” and 15” Extra Heavy**

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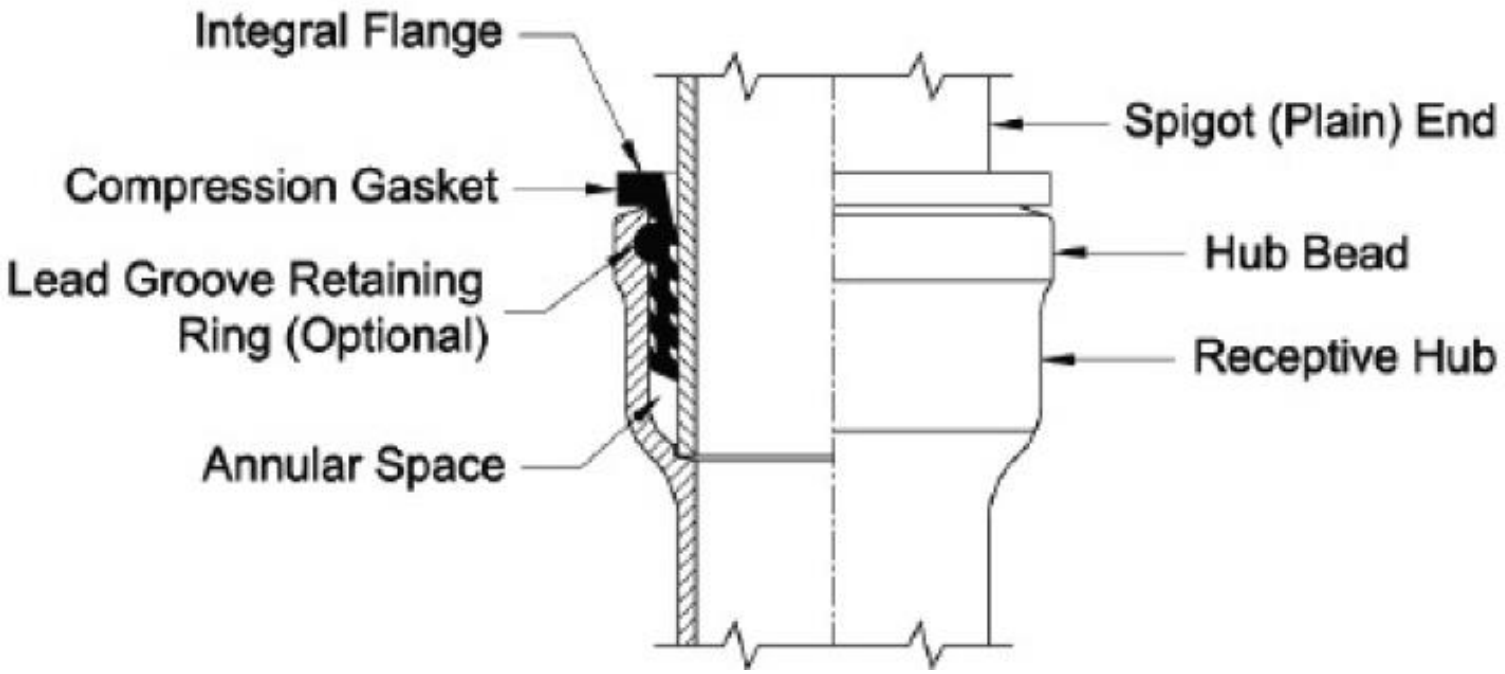
INSTALLATION: HUB & SPIGOT/COMPRESSION GASKETS

- **Compression gaskets provide an excellent seal that guards against exfiltration or infiltration. Gasketed joints can provide up to 5% deflection allowing for flexibility in trenches.**



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INSTALLATION: HUB & SPIGOT/COMPRESSION GASKETS

2”- 4”:

- Install gasket into hub
- Lubricate inside of gasket with “Ease-On” lubricant
- Pull pipe into hub

5” and up:

- Apply adhesive lubricant to both inside and outside of gasket

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INSTALLATION: HUB & SPIGOT/COMPRESSION GASKETS

- **Pull pipe or fitting into hub**
- **A pipe puller greatly aids in installation**

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INSTALLATION: HUBLESS COUPLINGS

- Lay out components
- Place neoprene gasket over pipe or fitting end
- Make sure all components bottom out with the center stop in gasket

- Place stainless steel shield over gasket

- Use coupling manufacturer's installation recommendations to tighten to specified torque using suggested tightening sequence.

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INSTALLATION: TORQUE WRENCHES AND TOOLS

Hubless couplings must be torqued in accordance with manufacturer's recommendations using a properly calibrated tool designed for the task.

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JOINING: CISPI 310 COUPLINGS

- **“Standard”, “Regular” or “CISPI 310” Couplings**
  - **The original coupling developed for use with Hubless pipe and fittings**
  - **Two standards: CISPI 310 and ASTM C 1277**
    - **2 bands 1½” - 4”**
    - **4 bands 5” - 10”**
    - **6 bands 12” - 15”**

- **Charlotte Pipe strongly recommends the use of CISPI 310 couplings to join it’s hubless pipe and fittings**

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JOINING: “HEAVY-DUTY” COUPLINGS

- **“Heavy Duty” Couplings**
  - **Slightly longer length than standard couplings in 1½” -10” sizes**
  - **Depending on size may have additional bands**
  - **Made to: ASTM C 1540**
    - **4 bands 1½” - 4”**
    - **6 bands 5” - 15”**

- **Heavy-Duty Couplings do not provide restraint nor do they take the place of recommended bracing, restraint or support.**
- **Failures in installations using couplings not conforming to CISPI 310, ASTM C 1277 or ASTM C1540 are not the responsibility of the company.**

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INSTALLATION: TESTING

Use a water or hydrostatic test

- A water test is the most reliable, common and safest leak test.

- Test to 10 ft. of head (4.3 psi)

- Never test using compressed air or gasses

- If necessary a smoke or peppermint test may be performed

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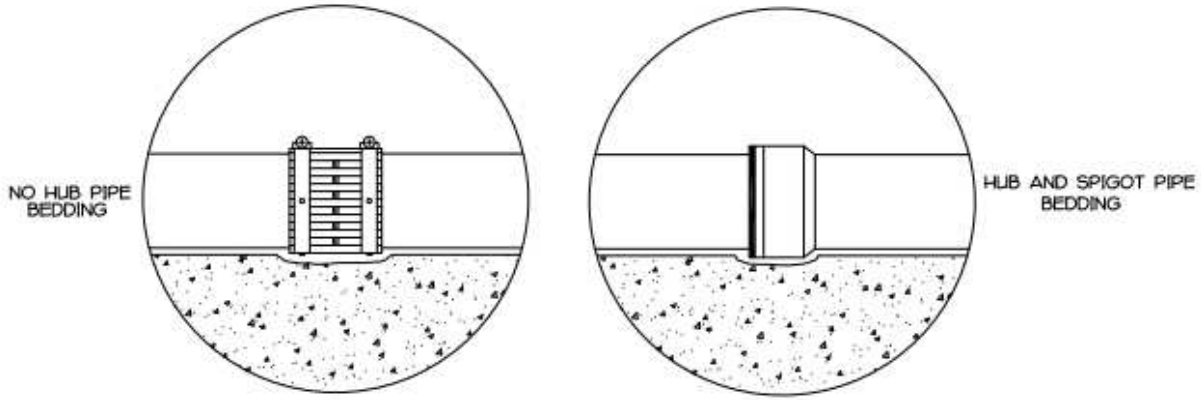
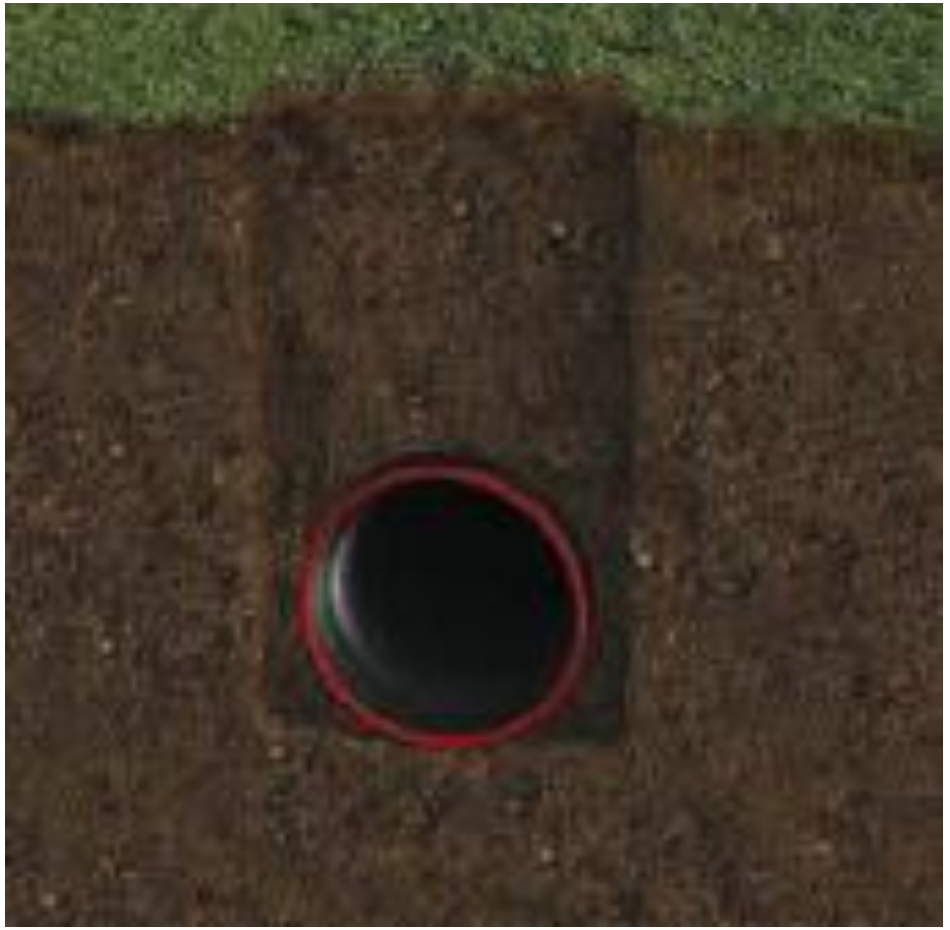
CAST IRON: ADVANTAGES

- **Cast iron is not dependent on side fill to support the pipe so trench widths need only be wide enough to provide easy assembly of the joints**

- **The trench bottom should provide continuous complete support of the pipe barrel. Holes should be provided at every joint for each hub or coupling**





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CAST IRON: ADVANTAGES

Low Coefficient of Expansion/Contraction

- Cast iron expands & contracts at about the same rate as structural steel and concrete so it literally “moves with the building”.

- Special compensation and/or joints or offsets are usually not required even in high-rise construction.

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CAST IRON: ADVANTAGES

Unique fittings that are only available in Cast Iron that are key components in commercial, institutional and multi-story construction.

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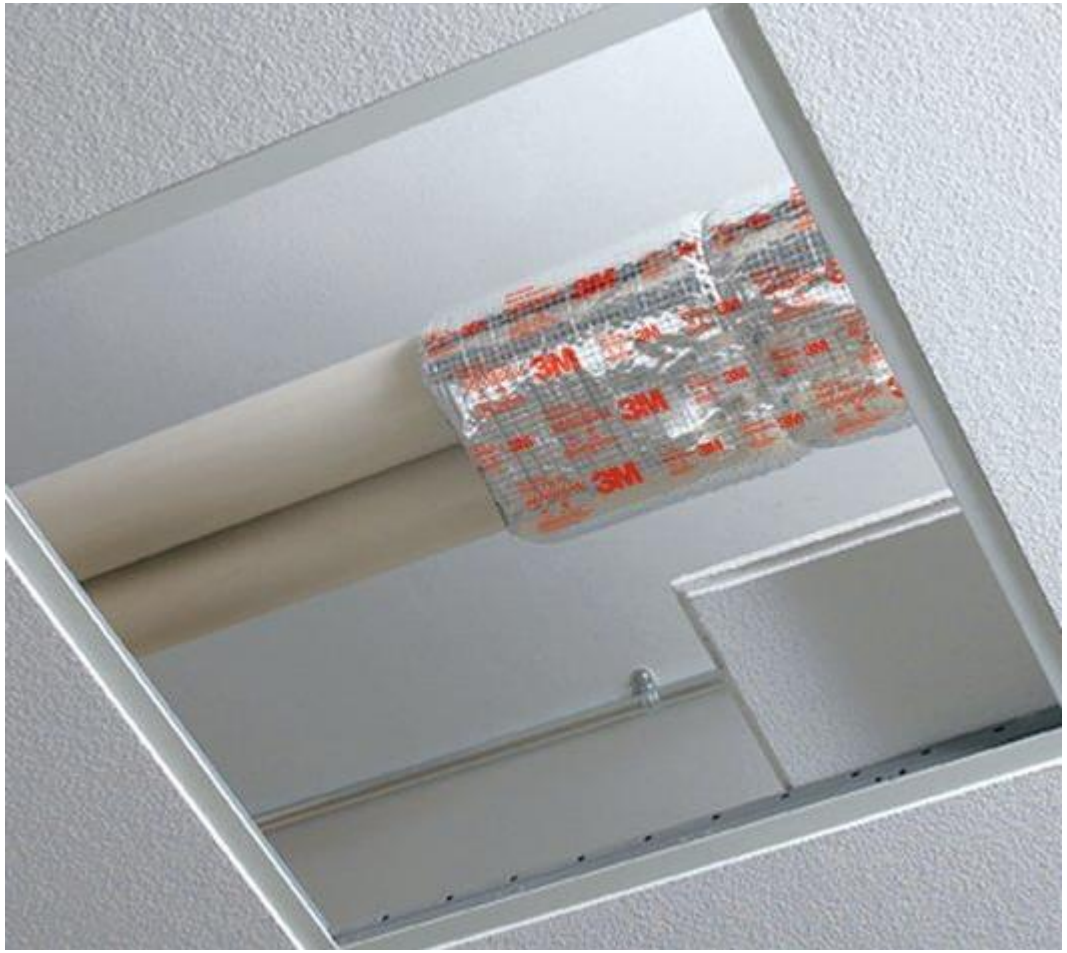
CAST IRON: ADVANTAGES



- **Cast Iron is Non-Combustible**
  - **No restrictions on use in return-air plenum areas**
  - **Much simpler & more economical to fire stop**

- **Cast Iron is Stronger**
  - **Deep Burial, Unstable Soil, Airports, Suspended from Slabs; the “tough applications”. Cast Iron is a rigid material capable of sustaining high live and earth loads**

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CAST IRON: ADVANTAGES

- **Cast Iron is Resistant to Abrasion**
  - **Highly resistant to sand, disposal residue, debris carried along in sanitary and storm drainage systems.**
- **Ability to Handle Temperature Extremes**
  - **Both Cast Iron and the neoprene gaskets used on both hub and spigot and hubless systems can safely transport liquids at up to 212ºF and does not become overly brittle in colder winter weather.**

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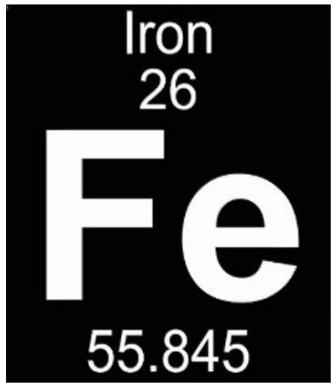
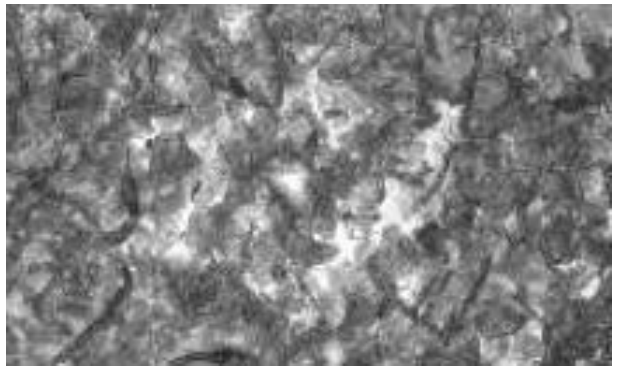
CAST IRON: ADVANTAGES

- **Cast Iron is Naturally Corrosion Resistant**
  - **Grey cast iron has a unique molecular structure that makes it highly corrosion-resistant and capable of handling the wastes normally encountered in sanitary and storm drainage systems. Cast iron truly will last the "life of the building".**





Graphite appears as "flakes" in grey iron and this structure explains the inherent corrosion resistance of the material

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CAST IRON: ADVANTAGES

- **Cast Iron means longevity**

- The use of cast iron truly dates to the “ancients”.

- The exact date of origin of the Delhi Pillar in New Delhi India is unknown but it dates back at least 1600 years

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CAST IRON: ADVANTAGES

- **Cast Iron means longevity.**

Arts and Industry Building – Smithsonian Insitute Washington, DC Completed in 1881.

The Building Today. As renovations began in 2010, the original cast iron pipe was evaluated and found to still meet specifications!

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CAST IRON: ADVANTAGES

- **Cast Iron means sustainability.**

Domestic Cast Iron is manufactured from at least 95% Post-Consumer scrap iron and steel and cast iron is 100% recyclable

Ask for Documentation: Domestic manufacturers can document recycled content by providing ICC-ES Verification of Attributes Reports

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You can't beat the system.®