LEAD ENGINEERING CONTRACTORS

# SUBMITTAL
DIVISION: 22
NO.: 221116-01

**Title:** Domestic Water Piping - Copper Type 'K' Pipe Product Data

**PRIORITY:** High

**Division:** 22
**No.:** 221116-01
**Contract No.:** E6L38
**LEAD Project No.:** 18-04

**DESIGN TEAM REVIEW**

| Rev. | Description | Received | From | Sent | To | Returned | Forwarded | Status | Days Held |
|---|---|---|---|---|---|---|---|---|---|
| A | Domestic Water Piping - Copper Type 'K' Pipe Product Data | 16-Oct-19 | KL | 16-Oct-19 | APCTE | | | OUT FOR REVIEW | |

**FDOT REVIEW**

| Rev. | Description | Received | From | Sent | To | Returned | Forwarded | Status | Days Held |
|---|---|---|---|---|---|---|---|---|---|

LEAD ENGINEERING CONTRACTORS

Review is for general conformance with the Contract Documents. Comments shall not be construed as relieving the supplier/subcontractor from strict compliance with such documents. The supplier/subcontractor remain responsible for details and accuracy, for complying with standards of the industry regarding fabrication, assembly, erection, and installation procedures.

☒ REVIEWED
☐ REVIEWED AS NOTED
☐ REVISED & RESUBMIT
☐ REJECTED

By: Joanna Flores Date: 10/16/2019

# Submittal #74.0

Kaufman Lynn Construction, Inc.
3185 S. Congress Avenue
Delray Beach, Florida 33445
Phone: 561-361-6700
Fax: 561-361-6979

**Project:** 1074 - Golden Glades Multimodal Transportation Facility
SW Quadrant of the Golden Glades Interchange Miami-Dade
Florida

# Domestic Water Piping - Copper Type 'K' Pipe Product Data

| | | | |
|---|---|---|---|
| **SPEC SECTION:** | | **SUBMITTAL MANAGER:** | Tom Reeder **(Kaufman Lynn Construction, Inc.)** |
| **STATUS:** | Open | **DATE CREATED:** | 10/16/2019 |
| **ISSUE DATE:** | 10/16/2019 | **REVISION:** | 0 |
| **RESPONSIBLE CONTRACTOR:** | Integ Miami LLC | **RECEIVED FROM:** | Eduardo Pereira |
| **RECEIVED DATE:** | 10/14/2019 | **SUBMIT BY:** | 10/16/2019 |
| **FINAL DUE DATE:** | 10/24/2019 | **LOCATION:** | |
| **SUB JOB:** | | **COST CODE:** | |
| | | **TYPE:** | Product Data |

**APPROVERS:** Mario Rojas **(A & P Consulting Transportation Engineers Corp.)**

**BALL IN COURT:**
Joanna Flores **(Lead Engineering Contractors)**

**DISTRIBUTION:**
Tom Reeder **(Kaufman Lynn Construction, Inc.)** , Leonor Flores **(Kaufman Lynn Construction, Inc.)** , Joanna Flores **(Lead Engineering Contractors)**

**DESCRIPTION:**

**ATTACHMENTS:**
#22 1116G-1 Domestic Water Piping - Copper Type K Pipe Product Data - Submitted.pdf

## SUBMITTAL WORKFLOW

| NAME | SUBMITTER/ APPROVER | SENT DATE | DUE DATE | RETURNED DATE | RESPONSE | ATTACHMENTS | COMMENTS |
|---|---|---|---|---|---|---|---|
| Joanna Flores | Submitter | | 10/17/2019 | | Pending | | |
| Mario Rojas | Approver | | 10/24/2019 | | Pending | | |

**BY** **DATE** **COPIES TO**

# Submittal # #42

KL
INTEG
COPPER
PIPE
Issue Date:
10/14/19

**KL SUBMITTAL #22 1116G-1**

FO-INTEG-PROJECT-PO0001-REV.03 Gestión de Control de Calidad / Quality Management

## Information

**Status:** In Review

**Task/tareas condition**

Legend
Overdue Issue On Time Delayed Start Inactive

**Project (CDC) - Empresa/ COMPANY:** Integ Miami LLC

**Project (CDC) - CDC ( Centro de Costo ):** I-PLUMBING-GGMTF-021919

**Project (CDC) - Customer Name:** Kaufman Lynn Construction

**Project (CDC) - Ubicacion:** 15890 Northwest 7th Avenue, Miami, Florida 33169

## Submittal

**Title:** Pipe and fitting Cooper Type K Underground Domestic Water Lines

**Spec Section:** SECTION 22 1116

**Description:** Pipe and fitting Cooper Type K - Underground Domestic Water Lines - All Buildings

**Submittal Type :** Product Data

**Submitted On:**

**Responsible Contractor:** Integ Miami LLC

**Submittal Manager:** Eduardo Pereira

**Issue Date:** 18-10-2019 12:00 AM

**Final Due Date:** 25-10-2019

**Lead Time:** 5

**Ball in Court:** Integ

## Attachment

**Attachment:** 42 Submittal PIPE & FITTING COOPER Type K.pdf

**Linked Drawings:**

**Notes:**

## Stamp Info

**Stamp Date:** 14-10-2019

**Other Name:**

☐ **Show Stamp on PDF:**

KAUFMAN LYNN CONSTRUCTION - SUBMITTAL
Project No. 1074 Submittal No. #22 1116G-1
- ✓ Reviewed ____ Make Corrections Noted
____ Submit Specified Item
*Checking is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Subcontractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques sequences of construction, coordination of his/her work with that of all trades, and the satisfactory performance of his/her work.*
DATE: 10/16/2019 BY: T. REEDER

## Submittal logs

Add Submittal LOG

KL
INTEG COPPER PIPE
Issue Date:
10/14/19

| Revision # | Date Submittal REV | Attachement Document: | Comments: |
|---|---|---|---|
| No submittal logs found | | | |

## Submittal Approval

☐ Approval Name/Title:

Signature _____

Created today at 7:29 AM (PDT). Last updated by pma@integca.com, PMA today at 2:40 PM (PDT). Owned by pma@integca.com, PMA.

**KL RECEIVED 10/23/2019**

Walker

Project Submittal Number:_____

☐ No Exception Taken
☐ Make Corrections Noted Resubmittal not Required
☐ Rejected
☐ Revise and Resubmit
☐ Submittal Not Required No Review Performed

Drawings have been reviewed for design intent and general compliance with the information given in the contract documents. Deviations from contract documents shall be clearly identified and are not reviewed nor accepted unless identified. Contractor is responsible for dimensions, quantities, fabrication, processes, and techniques of construction, coordination of its work with that of all other trades and satisfactory performance of its work.

Date: 10/22/2019 By: LFauss

**KAUFMAN LYNN CONSTRUCTION - SUBMITTAL**
Project No. 1074 Submittal No. #22 1116G-1
- ✓ Reviewed Make Corrections Noted
Submit Specified Item
*Checking is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Subcontractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques sequences of construction, coordination of his/her work with that of all trades, and the satisfactory performance of his/her work.*
DATE: 10/16/2019 BY: T. REEDER

KL
INTEG
COPPER
PIPE
Issue Date:
10/14/19

Streamline®
Tube • Fittings • Valves

KAUFMAN LYNN CONSTRUCTION - SUBMITTAL
Project No. 1074 Submittal No. #22 1116G-1
✓ Reviewed Make Corrections Noted
Submit Specified Item
*Checking is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Subcontractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques sequences of construction, coordination of his/her work with that of all trades, and the satisfactory performance of his/her work.*
DATE: 10/16/2019 BY: T. REEDER

# COPPER TUBE FOR PLUMBING AND MECHANICAL APPLICATIONS

**Job Name** GGMTF

**Contractor**

**Job Location** GOLDEN GLADES

**Wholesaler**

**Engineer**

**Streamline® Rep**

## Product Description:

Streamline® Copper Tube for use in plumbing and mechanical applications. Available sizes (Type K, L, M, & DWV) ranging from ¼" to 8" in diameter. All tube shall be manufactured in the United States.

## Material:

Streamline® Copper Tube is manufactured from UNS C12200 grade of copper.

## Key Specifications:

✓

Streamline® Copper Tube (Type K, L, M) shall conform to the NSF/ANSI 61 Annex G requirements and is manufactured to meet ASTM B88. Copper drainage tube (DWV) is made to meet ASTM B306. Copper refrigeration coils, ACR/Nitrogenized straight lengths and line sets are made to meet the chemical, mechanical, cleanness and eddy current testing requirements of the applicable specifications of ASTM B280.

## Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Developement Association at copper.org.

InTeg Integral Engineering

Reviewed for general conformance to the contract documents. This review does relieve the vendor of the responsibility of making the work conform to the plans and the **FDOT Design Standards.**

| | |
|---|---|
| Submittal: | 42 |
| CDC: | I-PLUMBING-GGMTF-021919 |
| Job #: | 424 |
| Reviewed by: | EDUARDO PEREIRA |
| Date: | 10/14/2019 |
| Vendor: | REVISION |
| Product Description: | PIPE & FITTING COOPER TYPE K UNDERGROUND D. WATER |

## References:

| | | |
|---|---|---|
| | ASTM B75 | Seamless Copper Tube |
| | C12200 | 99.9% Pure Copper (can be used for potable water) |
| | NSF/ANSI 61 Annex G | Safe Drinking Water Act (third party certification) |
| ✓ | ASTM B88 | Seamless Copper Water and Gas Tube (Type K, L, M) |
| | ASTM B280 | Seamless Copper Tube for Air Conditioning and Refrigerants |
| | ASTM B306 | Seamless Drainage Tube Code (DWV) |

***Copper [tube or fitting] UNS C122000 has been evaluated by NSF International to NSF/ANSI 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.***

MADE IN USA

A BRAND OF MUELLER INDUSTRIES

KL
INTEG
COPPER
PIPE
Issue Date:
10/14/19

Streamline®
Tube • Fittings • Valves

# COPPER TUBE DATA

Streamline® Copper Tube sets the standard for quality, consistency and service in the plumbing industries. With a full line of copper tube products to support most all plumbing supply and DWV applications, Streamline® Copper Tube is available in all common types including Type K, Type L, Type M and DWV. Each piece of tube is incised marked and color coded for easy, long lasting identity. Manufactured in accordance with applicable standards, our ongoing commitment to quality continues to make Streamline® Copper Tube the preferred and specified brand of industry professionals.

**TYPE K** **RATED WORKING PRESSURE (PSIG)**

| NOM. DIA. | WT/FT | FT/BNDL | 150°F | 200°F | 300°F | 400°F |
|---|---|---|---|---|---|---|
| 1/4 | 0.145 | 500 | 913 | 860 | 842 | 537 |
| 3/8 | 0.269 | 500 | 960 | 904 | 885 | 565 |
| 1/2 | 0.344 | 500 | 758 | 713 | 698 | 446 |
| 5/8 | 0.418 | 200 | 626 | 589 | 577 | 368 |
| 3/4 | 0.641 | 200 | 724 | 682 | 668 | 426 |
| 1 | 0.839 | 100 | 557 | 524 | 513 | 327 |
| 1 1/4 | 1.04 | 100 | 452 | 425 | 416 | 266 |
| 1 1/2 | 1.36 | 100 | 420 | 396 | 387 | 247 |
| 2 | 2.06 | – | 370 | 348 | 341 | 217 |
| 2 1/2 | 2.93 | – | 338 | 319 | 312 | 199 |
| 3 | 4.00 | – | 328 | 308 | 302 | 193 |
| 3 1/2 | 5.12 | – | 311 | 293 | 286 | 183 |
| 4 | 6.51 | – | 306 | 288 | 282 | 180 |
| 5 | 9.67 | – | 293 | 276 | 270 | 172 |
| 6 | 13.90 | – | 295 | 277 | 271 | 173 |
| 8 | 25.90 | – | 314 | 295 | 289 | 184 |

**TYPE L**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1/4 | 0.126 | 500 | 775 | 729 | 714 | 456 |
| 3/8 | 0.198 | 500 | 662 | 623 | 610 | 389 |
| 1/2 | 0.285 | 500 | 613 | 577 | 565 | 361 |
| 5/8 | 0.362 | 200 | 537 | 505 | 495 | 316 |
| 3/4 | 0.455 | 200 | 495 | 466 | 456 | 291 |
| 1 | 0.655 | 100 | 420 | 395 | 387 | 247 |
| 1 1/4 | 0.884 | 100 | 373 | 351 | 344 | 219 |
| 1 1/2 | 1.14 | 100 | 347 | 327 | 320 | 204 |
| 2 | 1.75 | – | 309 | 291 | 285 | 182 |
| 2 1/2 | 2.48 | – | 285 | 269 | 263 | 168 |
| 3 | 3.33 | – | 270 | 254 | 248 | 159 |
| 3 1/2 | 4.29 | – | 258 | 243 | 238 | 152 |
| 4 | 5.38 | – | 249 | 235 | 230 | 147 |
| 5 | 7.61 | – | 229 | 215 | 211 | 135 |
| 6 | 10.2 | – | 213 | 201 | 196 | 125 |
| 8 | 19.3 | – | 230 | 216 | 212 | 135 |

*Tables give computed allowable stress for annealed copper tube at indicated temperature.*

KAUFMAN LYNN CONSTRUCTION - SUBMITTAL
Project No. 1074 Submittal No. #22 1116G-1
- ✓ Reviewed Make Corrections Noted
Submit Specified Item
*Checking is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Subcontractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques sequences of construction, coordination of his/her work with that of all trades, and the satisfactory performance of his/her work.*
DATE: 10/16/2019 BY: T. REEDER

KL
INTEG
COPPER
PIPE
Issue Date:
10/14/19

Streamline®
Tube • Fittings • Valves

# COPPER TUBE DATA

**TYPE M** **RATED WORKING PRESSURE (PSIG)**

| NOM. DIA. | WT/FT | FT/BNDL | 150°F | 200°F | 300°F | 400°F |
|---|---|---|---|---|---|---|
| 3/8 | 0.145 | 500 | 485 | 456 | 447 | 285 |
| 1/2 | 0.204 | 500 | 420 | 395 | 387 | 247 |
| 3/4 | 0.328 | 200 | 346 | 326 | 319 | 204 |
| 1 | 0.465 | 100 | 286 | 270 | 264 | 169 |
| 1 1/4 | 0.682 | 100 | 287 | 271 | 265 | 169 |
| 1 1/2 | 0.94 | 100 | 282 | 265 | 259 | 166 |
| 2 | 1.46 | - | 254 | 239 | 234 | 149 |
| 2 1/2 | 2.03 | - | 233 | 219 | 215 | 137 |
| 3 | 2.68 | - | 215 | 203 | 199 | 127 |
| 3 1/2 | 3.58 | - | 214 | 202 | 197 | 126 |
| 4 | 4.66 | - | 213 | 201 | 197 | 126 |
| 5 | 6.66 | - | 198 | 186 | 182 | 116 |
| 6 | 8.92 | - | 186 | 175 | 171 | 109 |
| 8 | 16.5 | - | 195 | 183 | 180 | 115 |

**TYPE DWV**

| NOM. DIA | WT/FT | FT/BNDL | 150°F | 200°F | 300°F | 400°F |
|---|---|---|---|---|---|---|
| 1 1/4 | 0.65 | 100 | 280 | 269 | 258 | 165 |
| 1 1/2 | 0.809 | 100 | 249 | 240 | 230 | 147 |
| 2 | 1.07 | - | 185 | 178 | 170 | 109 |
| 3 | 1.69 | - | 135 | 130 | 125 | 80 |
| 4 | 2.87 | - | 127 | 122 | 117 | 75 |
| 5 | 4.43 | - | 129 | 124 | 119 | 76 |
| 6 | 6.1 | - | 126 | 121 | 116 | 74 |
| 8 | 10.6 | - | 124 | 119 | 114 | 73 |

*Table give computed allowable stress for annealed copper tube at indicated temperature.*

## TECHNICAL DATA

Values of allowable internal working pressure for copper tube in service are based on the formula from ANSI B31, Standard Code for Pressure Piping:

$$P = \frac{2\,S\,tm}{D\,max - 0.8\,tm}$$

P = Allowable Pressure
S = Allowable stress
T = Wall thickness
D Max = Outside Diameter

D max - 0.8 tm

@150°F S = 5100 PSIG annealed
@ 200°F S= 4800PSIG annealed
@ 300°F S= 4700 PSIG annealed
@ 400°F S= 3000 PSIG annealed

KAUFMAN LYNN CONSTRUCTION - SUBMITTAL
Project No. 1074 Submittal No. #22 1116G-1
- ✓ Reviewed Make Corrections Noted
Submit Specified Item
*Checking is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Subcontractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques sequences of construction, coordination of his/her work with that of all trades, and the satisfactory performance of his/her work.*
DATE: 10/16/2019 BY: T. REEDER

All ratings listed for types K, L, M, DWV and refrigeration service tube in the preceding charts are calculated for tube in the annealed condition. These values should be used when soldering, brazing or welding is employed for joining components in a system. While the ratings for hard drawn tube are substantially higher, they should only be used for systems using properly designed flare or compression mechanical joints, since joining by any heating process might anneal (soften) the tube.

In designing a system, careful consideration should also be given to joint ratings as well as those of the components.

KL
INTEG
COPPER
PIPE
Issue Date:
10/14/19

Streamline®
Tube • Fittings • Valves

# COPPER TUBE AND SOLDER TYPE FITTINGS

1. Cut tube square with the cutter or fine hack saw (32 tooth blade is recommended). Remove Burr.

2. Clean outside end of copper tube thoroughly with sand cloth or sandpaper equal depth of fitting. Leave no dark spots.

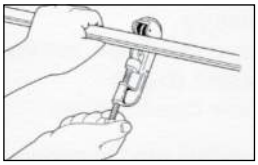
3. Clean inside of fitting carefully to tube stop with wire brush. Note: Sand cloth or sandpaper may also be used.

4. Using a brush, apply light uniform coat of soldering flux to the outside of the tube and inside of the fitting.

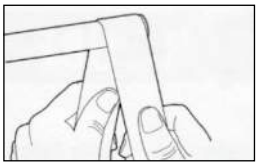
5. Slip tube into fitting to tube stop. Turn tube back and forth once or twice to distribute flux evenly.

6. Apply heat uniformly around the fitting with torch. When solder melts upon contact with heated fitting, the proper soldering temperature has been reached. Remove flame and feed solder slightly off center at the bottom of the joint. Proceed across the bottom of the fitting and up to the top center position. Return to the starting point, and then proceed up the incomplete side to the top, again, overlapping the solder metal. Wipe off surplus solder with a piece of cloth.

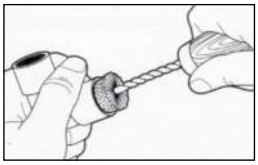
**CAUTION: No not overheat the joint or direct the flame into the face of the fitting cup. Overheating could burn the flux, which will destroy its effectiveness and the solder will not enter the joint properly.**



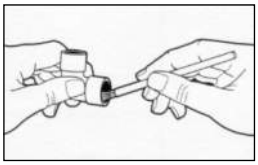
1. Cut tube to length & remove burr with file or scraper.



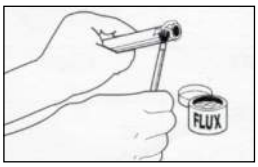
2. Clean outside of tube with sandpaper or sand cloth.



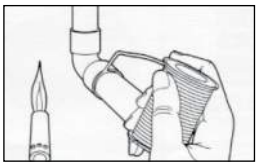
3. Clean inside of fitting with wire brush, sand cloth or sandpaper.



4. Apply flux thoroughly to inside of fitting.




5. Apply flux thoroughly to outside of tube - assemble tube and fitting.



6. Apply heat with torch. When solder melts upon contact with heated fitting, the proper temp for soldering has been reached. Remove flame & feed solder to the joint at one or two points until a ring of solder appears at the end of the fitting.

KAUFMAN LYNN CONSTRUCTION - SUBMITTAL
Project No. 1074 Submittal No. #22 1116G-1
- ✓ Reviewed ____ Make Corrections Noted
____ Submit Specified Item
*Checking is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Subcontractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques sequences of construction, coordination of his/her work with that of all trades, and the satisfactory performance of his/her work.*
DATE: 10/16/2019 BY: T. REEDER

A BRAND OF MUELLER INDUSTRIES