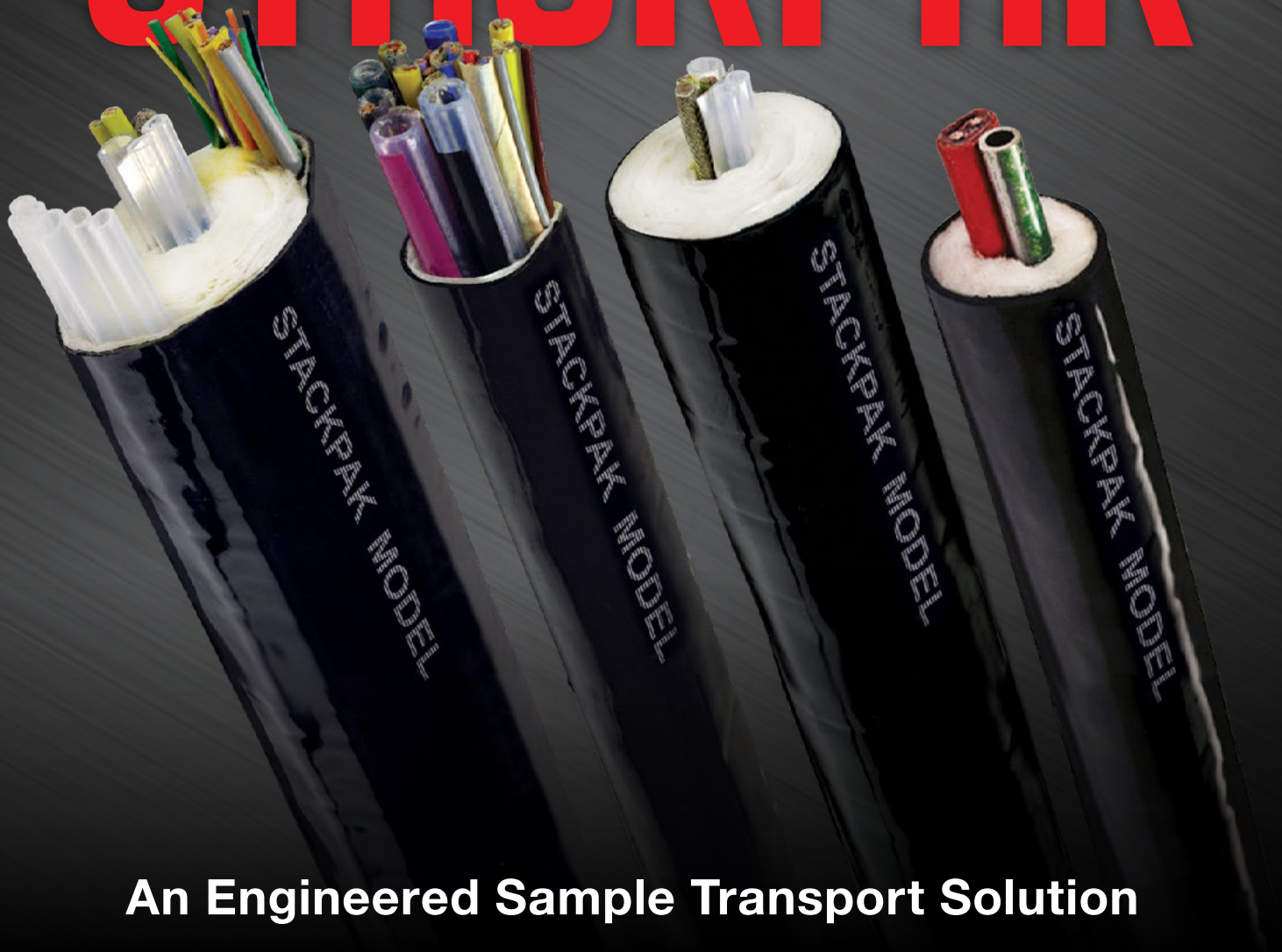




# STACKPAK™



**An Engineered Sample Transport Solution**

TUBING BUNDLE / ENCLOSURES / HEATERS / SUPPORTS / INSTALLATION





For over 50 years O'Brien—an AMETEK company—has provided customers with engineered products and solutions for field instrument installations and sample transport. As proven experts in heat transfer and process accuracy, our STACKPAK™ sample transport bundle ensures temperature maintenance, freeze protection, and environmental durability in demanding applications.

# STACKPAK™

## ANALYTICAL GAS SAMPLE TRANSPORT SOLUTION



Reliable and consistent temperature maintenance of sample during transport.



All required support systems incorporated in one bundle.



Heated and unheated tubes for sample, blow back and calibration gas.



Simplified installation and temperature control.

### 3 STACKPAK™ Analytical Gas Sample Transport Solution

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## OVERVIEW

STACKPAK™ is a gas sample transport tubing bundle designed to maintain consistent temperatures while reduce adsorption and desorption of components like H<sub>2</sub>O (moisture), NO<sub>x</sub>, SO<sub>x</sub>, and CO<sub>2</sub>. This ensures an analytically representative sample is maintained while transporting gas from the process or stack probe to the sample conditioning system or directly to the analyzer.

Precise temperature maintenance is achieved with a wide selection of the industry's highest quality self-regulating or constant wattage electric tracers, integral temperature sensors, and tightly wound insulation. These features ensure sample components avoid reaching their dew points, ensuring accurate and representative measurements.

TrueTube® offers electropolishing (EP) or passivation of the inner tubing to significantly reduce adsorption and desorption phenomena, resulting in faster response times and a representative analytical measurement, critical details, during step changes. Options for SilcoNert™ or Dursan™ coatings provide additional abrasion and corrosion protection.

The highly configurable STACKPAK tubing bundle allows single or multiple transport tubes of specified material types to be combined within the heated core and color-coded for easy identification. Additional pneumatic and calibration gas tubes, along with power and signal wiring, can be included in the unheated bundle section to meet your exact specification requirements.



## FEATURES & BENEFITS


- **Precise Temperature Control:** Integral heat trace and temperature sensor keep gas samples above dew points to prevent phase change and component drop-out.
- **Compact, Space-Saving Design:** Slim outer diameter and tight bend radius allow easy installation in confined areas.
- **Customizable Configurations:** Multiple tubing materials, finishes, coatings and bundle layouts to meet exact applications needs.
- **Simplified Installation:** Pre-assembled bundles with optional factory sealed ends and integrated components reduce install time and errors.
- **Rugged and Durable:** Weatherproof jackets and corrosion-resistant materials ensure long service life in harsh environments.
- **Fast, Accurate Analysis:** Passivated, Electropolished (EP), and ID coatings (Silconert™, Dursan™) minimize adsorption and desorption for faster analyzer response times.
- **Fully Equipped System:** Power kits, end seals, and controllers provide complete, ready-to-install solutions.

## WHY O'BRIEN STACKPAK™?


- **Tailored for Your Application:** Engineered to match your specific system and performance needs.
- **Smarter Bundle Design:** Compact insulation and parallel cores improve flexibility and reduce footprint.
- **Lower Operating Costs:** Efficient heating and high R value insulation reduce energy use. (**NOTE:** Fast setup and labor time are one-time installation costs, not recurring operating costs.)
- **Better Measurement Accuracy:** Reliable sample integrity ensures compliance and quality control.
- **Built to Last:** Withstands extreme conditions for long-term reliability.

## INDUSTRIES


STACKPAK™ supports critical applications in:




Environmental Monitoring (CEMS)




Chemical and Petrochemical




Power Generation




Automotive Testing




Food and Beverage



Pharmaceuticals



Pulp and Paper



Sample Analysis

## CUSTOM DESIGNS

### SOLUTIONS FOR UNIQUE APPLICATIONS

In addition to conventional STACKPAK™ designs, O'Brien can satisfy your needs with custom solutions. Modeling for these designs has been verified in our environmental chamber under conditions ensuring a tubing bundle that meets your exact requirements, with reliability and accuracy you can depend on.



### CUSTOM CAPABILITIES

- Indoor and Outdoor Use
- Maintenance Temperatures to 400°F (204°C)
- Customizable Factory Finished and Sealed Ends
- Custom Lengths
- Factory Installed Power and Termination Kits
- Factory Installed Temperature Sensors
- Communication, Monitor and Power Wires
- Alternate Jacket Colors



#### MULTI-COMPONENT BUNDLES:

STACKPAK™ streamlines complex sample transport with a modular design tailored to CEMS applications. Each bundle can be configured with factory-installed RTDs or thermocouples, multiple process and calibration gas tubes, communication and power wiring, and heat tracing. For added flexibility and long-term cost savings, customers can choose a dual bundle design—separating the heated tracer bundle from the unheated support bundle. This allows for targeted replacement of only the heated section should a tracer failure occur, minimizing downtime and reducing maintenance costs.



#### COMPREHENSIVE TUBE MATERIAL & SIZE OPTIONS:

STACKPAK™ can be manufactured with a wide range of materials and sizes to conform to your unique material requirements, including but not limited to:

- Stainless Steel
- Copper
- PTFE, PFA, and FEP
- Alloy C276, Alloy 825, Alloy 625, 6% Moly, Duplex and Super Duplex
- Oxygen Cleaned Tubes (passivated) with or without Silconert™ 2000 or Dursan™ ID coatings
- Electropolished tubes with or without Silconert 2000 or Dursan ID coatings



#### JACKET MATERIALS FOR DIVERSE APPLICATIONS:

STACKPAK™ offers jacket options engineered for performance in a wide range of environments—from extreme cold to high heat, and from general-purpose to hazardous areas. Choose from durable TPU or O'Brien's proprietary SV47 PVC blend for superior weather resistance and flexibility. Each material has been tested in environmental chambers to ensure long-term reliability, even in the harshest conditions. Whether your application is indoor, outdoor, marine, or industrial, O'Brien provides jacket solutions tailored to your specific needs.



# TOTAL SAMPLE TRANSPORT SOLUTIONS

## CONTINUOUS EMISSIONS MONITORING SYSTEMS (CEMS)

Suitable for all industries with combustion processes requiring regulation.

### 1. Probe Enclosures

Insulated enclosures provide a stable environment for the probe, piping components, and sampling equipment. Heated enclosures are also used to prevent temperatures from dropping below the dew point of the sample.



### 2. Enclosure Heaters

Consistent temperatures. Up to 600 watts. Approved for use in hazardous and general purpose/safe areas. O'Brien has a wide range of electric and steam heaters for temperature maintenance.



### 3. Installation Grips

End of line and mid line installation grips for bundles up to 3½" (80mm) diameter.



### 4. TrueTube®

TrueTube® is available in long continuous lengths of electropolished (TrueTube E, TE, and TER) and electropolished tubing with a deactivated fused silica lining (TrueTube ES). It is also available in convenient sticks and weld fittings. Non-permeable TrueTube is used for measuring NO<sub>x</sub>, SO<sub>x</sub>, corrosives, ammonia and mercury. TrueTube E, TE, TER and ES improve dry-down, adsorption and corrosion resistance. They also improve response times when measuring sulfur, moisture, corrosives, and tailgas in the low ppm/ppb range.



### 5. STACKPAK™ & Probe Support Bundle

Heated and unheated lines for dilution and extractive stack gas applications. STACKPAK™ will maintain uniform temperatures of gas samples such as SO<sub>x</sub>, CO<sub>2</sub>, NO<sub>x</sub> and Hg.



### 6. Heat Shrink Entry Seals

Heat shrink entry seals provide a weatherproof entry where TRACEPAK® or STACKPAK™ bundles enter an enclosure.

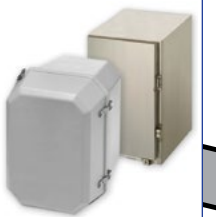


## PROCESS ANALYZING

Ideal for chemical, petrochemical, and refining industries.

### 7. Sample Point Enclosures

Provides a weatherproof and insulated enclosure for sample take off, piping components, and vaporizing regulators.



### 8. Sample Point Heaters

Hazardous area heaters for sample point enclosures.



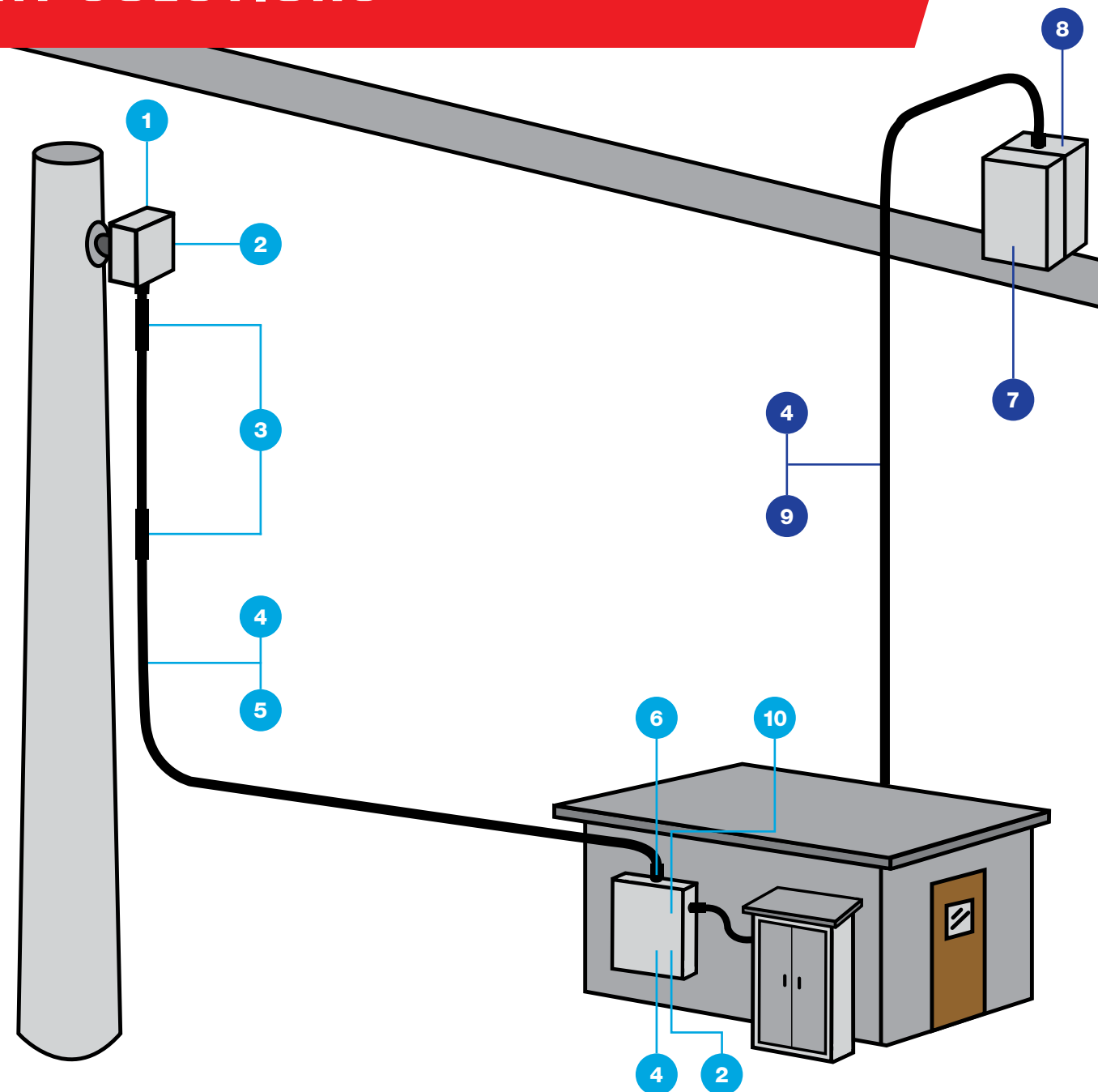
### 9. STACKPAK™ & TRACEPAK®

Temperature controlled sample transport systems for process and gas analyzers. Single or multiple process tubes of 316SS, Alloy 400, TrueTube®, Alloy C276, fused silica lined SS, heavy wall Teflon, and nylon are some of the choices.



### 10. Sample Cabinets

VIPAK® thermoformed or metal sample cabinets are available insulated and uninsulated.



SELECTION GUIDE:

# SAMPLE TRANSPORT TUBING

## OPTIMIZING TUBE SELECTION FOR ANALYZER SAMPLE SYSTEMS

In analyzer sample systems, the integrity of your data begins with the tubing. Selecting the right tube material is critical to ensuring accurate, reliable, and repeatable results. From corrosion resistance to adsorption control, every detail matters.

## WHY TUBE SELECTION MATTERS

Improper tube selection can lead to:

- Sample contamination or loss due to adsorption or permeation
- Corrosion-induced failures
- Flow restrictions, kinking, or delayed response times
- Analyzer inaccuracies from desorption “memory effects”

## MATERIAL MATTERS

O’Brien offers a comprehensive range of tubing and wiring solutions tailored to diverse process conditions. Our selection includes:



### METALS:

Stainless steel (welded/seamless), Alloy 400, Alloy C276, Alloy 625, Alloy 825, SuperDuplex, and copper.



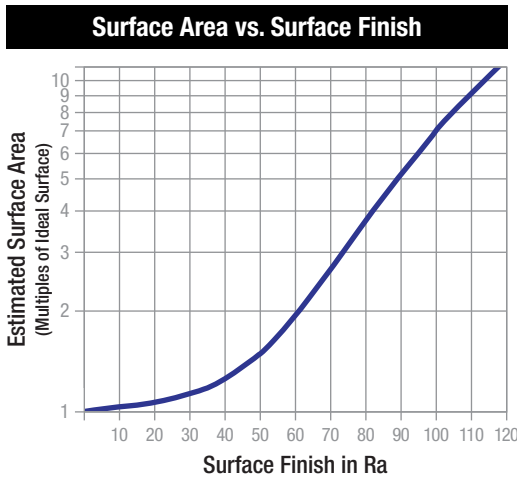
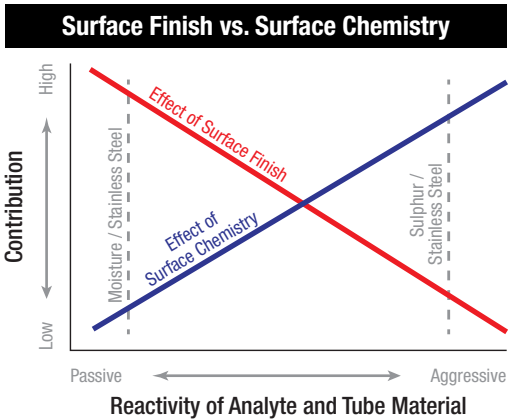
### NON-METALS:

Fluoropolymers (PFA, FEP, PTFE), polyethylene, and Halar® (ECTFE).



### UNHEATED WIRING AND CABLE OPTION:

Unheated wiring is available in single-conductor configurations using PTFE or PVC insulation, as well as customizable multi-conductor options such as tray cables, PLTC cables, and RTD or Thermocouple extensions.



## TRUETUBE®: ENGINEERED FOR PERFORMANCE

Our TrueTube® family is designed to elevate sample transport performance. Starting with ASTM-grade tubing, we enhance surface characteristics to minimize adsorption, improve dry-down, and resist corrosion. This is achieved through precise control of surface roughness, cleanliness, and chemical reactivity.

### CLEANLINESS & CONTAMINANTS

TrueTube undergoes rigorous cleaning to remove oils and surface iron, enriching the Cr/Fe ratio for superior corrosion resistance.

### CORROSION RESISTANCE

Material choice must account for both normal and upset conditions. For example, stack gas systems may form corrosive acids if condensation occurs—requiring robust materials or coatings.

### POROSITY & PRESSURE

Fluoropolymers are common but porous and pressure-limited, especially at high temperatures. For critical applications, thick-walled tubing or coated stainless steel (e.g., SilcoNert 2000) is recommended.

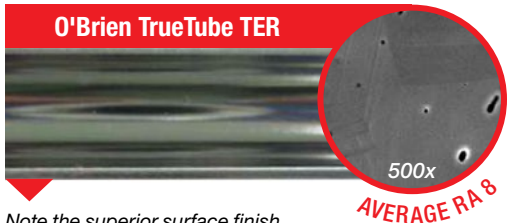
### ADSORPTION & DESORPTION

Stainless steel can trap trace compounds, causing delays and false readings. Electropolished or coated tubing mitigates this “memory effect,” ensuring faster, more accurate analyzer response.

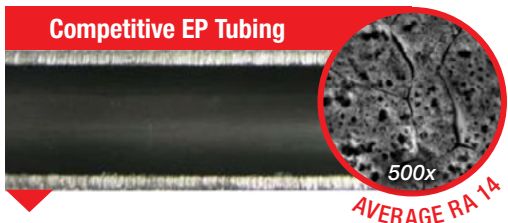
### SURFACE ROUGHNESS

Smoother surfaces reduce adsorption. TrueTube products are polished to minimize roughness, enhancing system accuracy and repeatability.

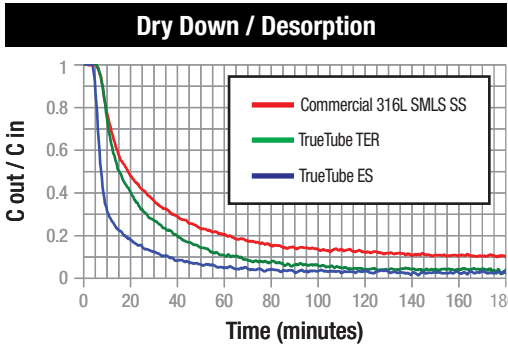
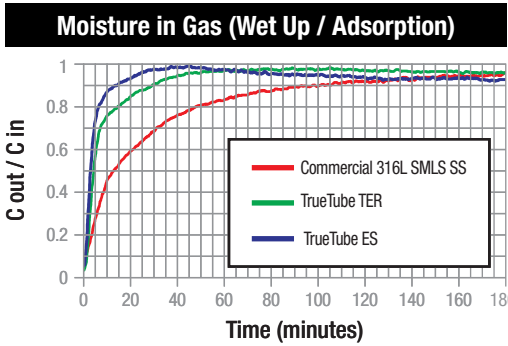
Choosing the right tubing is essential for maintaining sample integrity and analyzer accuracy. With O’Brien’s TrueTube solutions—engineered surfaces, advanced coatings, and expert material selection—you can trust your sample system to deliver consistent, reliable results.



Note the superior surface finish achieved by O’Brien electropolished TrueTube TER.

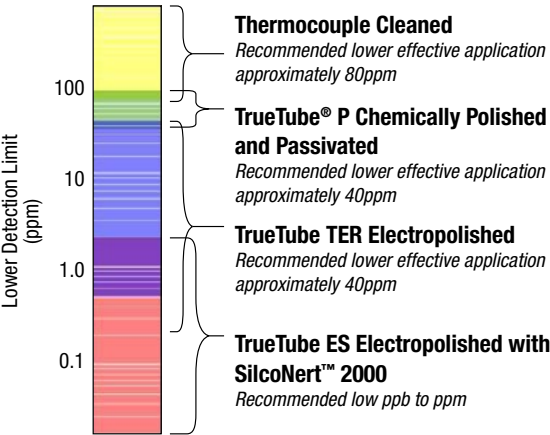


While the surface roughness in the competitor’s product is low, the defect count was too high to measure.

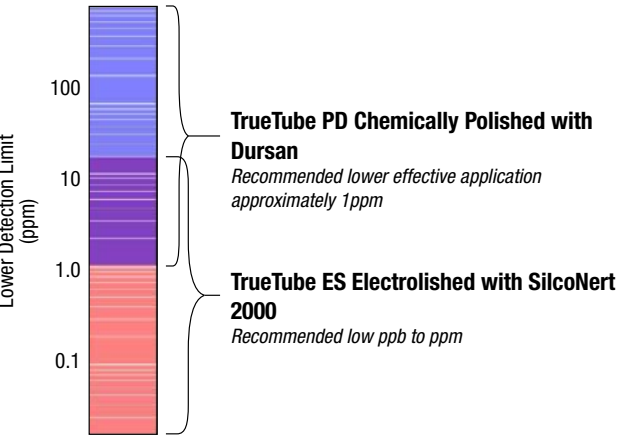


CONSIDER THE FOLLOWING SELECTION GUIDELINES:

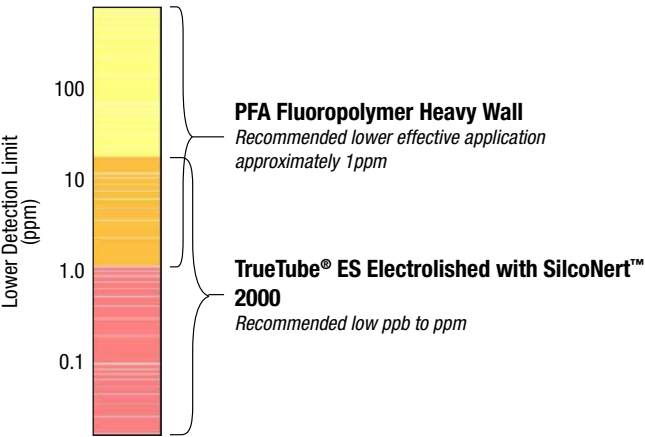
MOISTURE



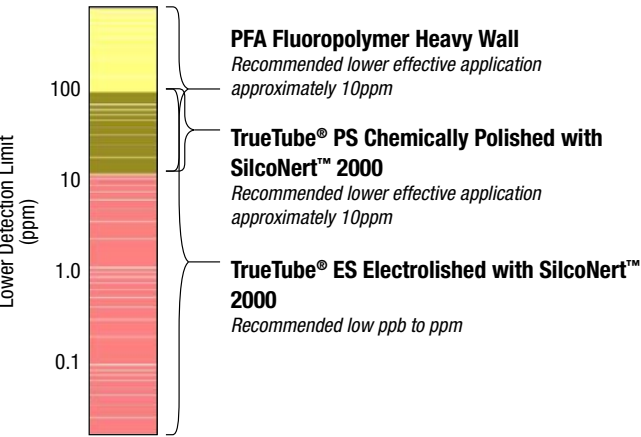
HIGH PH & ABRASIVE SAMPLES



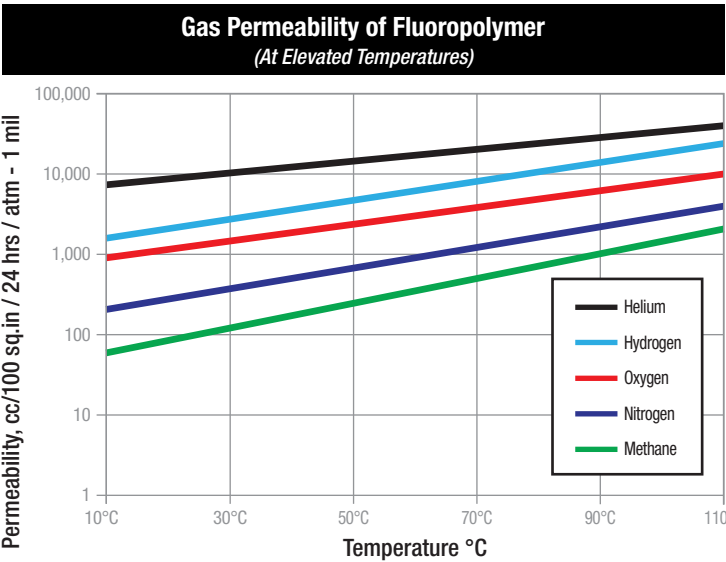
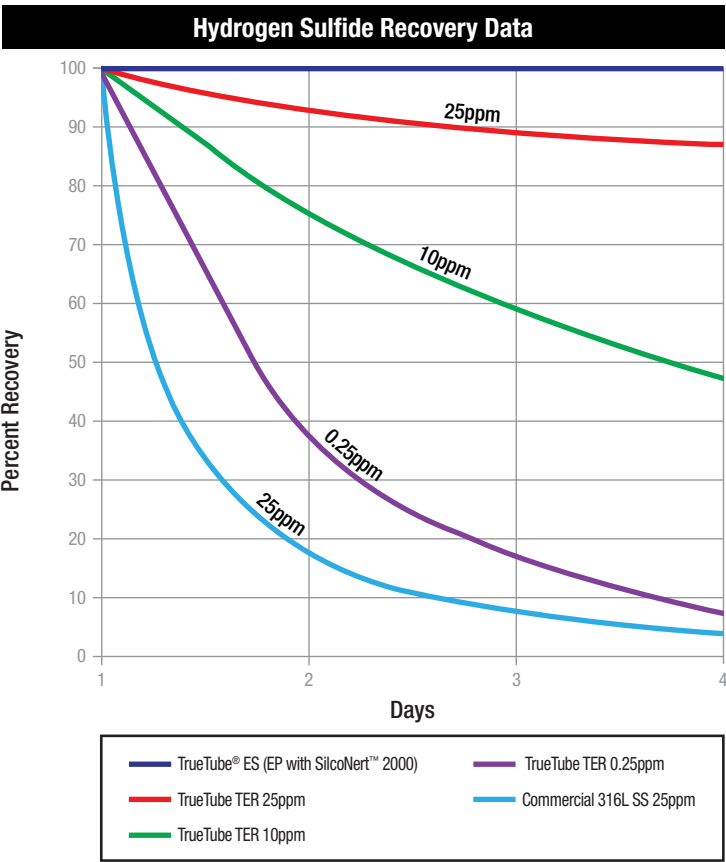
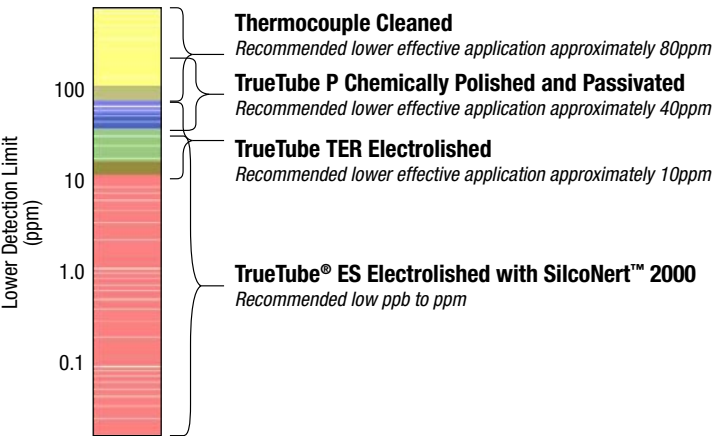
MERCURY



AMMONIA



SULFUR



ADVANCED COATINGS FOR DEMANDING APPLICATIONS

We offer two high-performance coatings from SilcoTek®:

- **SilcoNert™ 2000:** An ultra-inert, silicon-based coating ideal for trace-level analysis. Applied to TrueTube PS and ES, it resists most chemicals but is limited against bases and fluorides.
- **Dursan™:** A carbon-based, hydrophobic coating with exceptional resistance to acids, bases, and abrasion. Ideal for high-pH or abrasive environments, used in TrueTube PD.

Both coatings are bonded to chemically polished or electropolished substrates, ensuring optimal adhesion and performance.



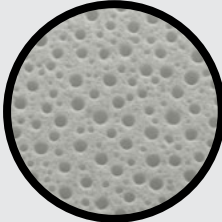
The STACKPAK™ design request form is available online at:

<https://www.obcorp.com/-/media/ametekobrien/documents/literature/how-to-order/stackpakrequest.pdf>



GUIDELINES FOR SELECTING SAMPLE TRANSPORT TUBING


COMMON OPTIONS



**Fluoropolymer Tubing**

PFA, PTFE, and FEP are the most common fluoropolymers used in sample transport. Chosen for their exceptional chemical inertness, they are ideal for volatile compounds and aggressive fluids.


- **USE:** Low-pressure chemical/sample lines where metal is unsuitable
- **SURFACE ROUGHNESS:** Not applicable
- **ADVANTAGES:** Chemically inert, flexible, ideal for cleanliness-critical applications
- **LIMITATIONS:** Permeable; limited pressure/temperature range; not suitable for oxygen-sensitive or high-purity systems



**Commercial 316L Seamless Stainless Steel**

Commercial 316L seamless stainless steel is widely used but varies in surface quality. Rough surfaces and residual manufacturing contaminants can impair sample accuracy.

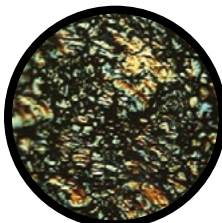
- **USE:** Standard instrument tubing
- **SURFACE ROUGHNESS:** Not Specified
- **ADVANTAGES:** Inexpensive, widely available
- **LIMITATIONS:** High surface roughness promotes adsorption/desorption; susceptible to corrosion and oxygen degradation



**TrueTube Passivated (P)**

Chemically polished 316L stainless steel tubing. It meets ASTM A632-S3, ASTM G93 Level A, and CGA G-4.1 standards for cleanliness. Ideal for reducing adsorption and improving response time.

- **USE:** Clean sample lines requiring reduced adsorption
- **MATERIAL:** Chemically polished 316L SS
- **ADVANTAGES:** Improved cleanliness, reduced surface reactivity, free of iron contaminants
- **LIMITATIONS:** Still subject to corrosion and oxygen degradations



**TrueTube Passivated & SilcoNert™ 2000 (PS)**

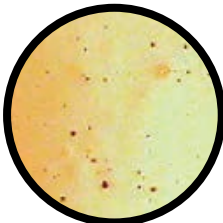
Features a **SilcoNert™ 2000** silicon coating over chemically polished stainless steel. This ultra-inert barrier enhances corrosion resistance and minimizes interaction with reactive compounds like H<sub>2</sub>S—ideal for trace sulfur analysis.

- **USE:** Sulfur and moderate acid samples
- **MATERIAL:** SilcoNert 2000 coated chemically polished 316L SS
- **ADVANTAGES:** Excellent inertness, high-temperature stability, ideal for low-level sulfur transport
- **LIMITATIONS:** Poor resistance to bases and fluorides

\* Images are shown at 500x.

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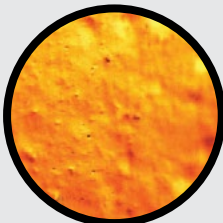
TRUETUBE® SOLUTIONS BY O'BRIEN



**TrueTube Passivated & Dursan™ (PD)**

Coated with **Dursan™**, a durable silicon-carbon layer that resists both acids and bases. While slightly less inert than SilcoNert™, it offers superior abrasion resistance and pH stability—perfect for harsh or high-pH environments.

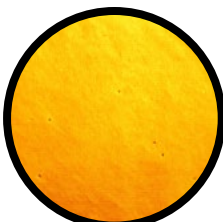
- **USE:** Highly acidic or basic environments
- **MATERIAL:** Dursan coated chemically polished 316L SS
- **ADVANTAGES:** Broad pH resistance (0–14), superior corrosion and abrasion resistance
- **LIMITATIONS:** Less inert at ppb levels; avoid hydrofluoric acid exposure



**TrueTube Electropolished (E)**

Electropolished to a mirror-like finish with minimal surface defects. The chromium-enriched surface enhances corrosion resistance and reduces dry-down time.

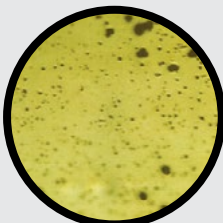
- **USE:** Critical systems sensitive to adsorption/desorption
- **MATERIAL:** Commercial Grade Electropolished 316L SS
- **ADVANTAGES:** Enhanced corrosion resistance, smoother surface, reduced memory effects
- **LIMITATIONS:** Limited chemical resistance vs. coated options. Available in 1/8"–1/2" OD sizes only. Max lengths: 100 ft for 1/8", 300 ft for 1/4"–1/2"



**TrueTube Premium and Premium Plus Electropolish (TE and TER)**

Electropolished to a mirror-like finish with surface roughness guarantee and minimal surface defects. The chromium-enriched surface enhances corrosion resistance and reduces dry-down time. This is the smoothest tubing in the TrueTube® family and comes with the surface roughness guarantee.

- **USE:** Ultra-high purity critical systems sensitive to adsorption/desorption
- **MATERIAL:** Special Grade 316L SS Electropolished
- **SURFACE ROUGHNESS:** TE = ≤20 µin and TER = ≤10 µin
- **ADVANTAGES:** Enhanced corrosion resistance, smoother surface, reduced memory effects
- **LIMITATIONS:** Limited chemical resistance vs. coated options. Available in 1/8"–1/2" OD sizes only. Max lengths: 100 ft for 1/8", 300 ft for 1/4"–1/2"



**TrueTube Electropolished & SilcoNert™ 2000 (ES)**

Combines the benefits of **electropolishing** and **SilcoNert 2000** coating. This dual treatment delivers unmatched performance in corrosion resistance and sulfur compound aversion—ideal for the most demanding applications.

- **USE:** Low-pressure chemical/sample lines where metal is unsuitable
- **MATERIAL:** SilcoNert 2000 coated electropolished 316L SS
- **ADVANTAGES:** Fastest response time, lowest adsorption, ideal for sulfur/moisture analysis
- **LIMITATIONS:** Same chemical limitations as SilcoNert 2000

\* Images are shown at 500x.

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ACCESSORIES:

# JACKET INFORMATION

## JACKET MATERIALS

**SV47** is a proprietary thermoplastic formulation that exceeds the requirements of 105C PVC and outperforms other PVC jacket materials in UV resistance as well as providing low temperature flexibility.

**TPU** is a thermoplastic polyurethane jacket that offers excellent abrasion resistance and extreme cold temperature workability. TPU also contains no chlorides so it should be selected for applications where chloride stress cracking is a problem.



	STANDARD 105C PVC	O'BRIEN SV47	TPU
Abrasion Resistance G G E	G	G	E
Tensile Strength PSI	18-1900	2200	6000
Elongation %	250	350	700
Hardness, Shore A	85-90	80	80
Minimum Service Temperature	None Stated	-30°F/-35°C*	-67°F/-58°C
Minimum Installation Temperature	15°F/-9°C	-10°F/-23°C*	-40°F/-40°C
UL94 Flame	V2	V2	V0 to V2
Halogenated (Chlorides)	YES	YES	NO
Maximum Temperature	220°F/105°C	220°F/105°C	250°F/120°C
Water Absorption %	0.1%	0.1%	1.2-1.4%
Aromatic Hydrocarbons	F	F	G
Weathering	G	G	E
UV Resistance	F	G	E

**E = Excellent   G = Good   F = Fair   P = Poor**

\* Minimum service and installation temperature for SV47 have been determined by test on tubing bundles. The base material is rated at -40° by the manufacturer when used as jacket for wire and cable. However, this is a false indication of performance when used as a weatherproof jacket on a tubing bundle. Tubing bundles are typically much larger in diameter, more flexible and have a softer 'core' than wire and cable. Consequently the advertised temperatures for what are termed Arctic PVC overstate the useful temperature range on tubing bundles.

## JACKET COLORS

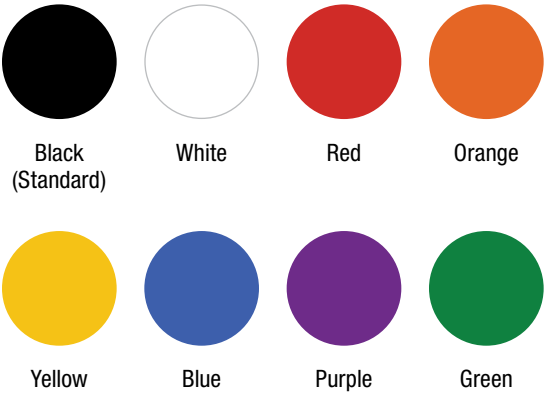
### O'BRIEN TPU COLORS

14 Available



### O'BRIEN PVC COLORS

8 Available — Only Available on Large Projects





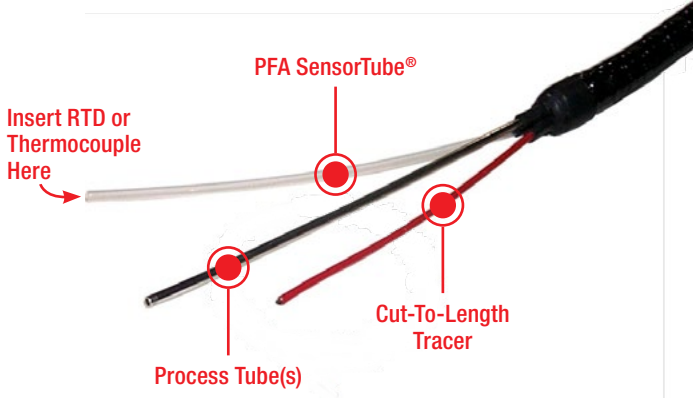
ACCESSORIES:

# TEMPERATURE SENSING

## SENSORTUBE™

SensorTube™ is a design option that must be requested at time of quote. An additional PFA tube in the heated core creates a pathway for a temp sensor to be inserted up to 20' (6m) from the control end without any special tools. This eliminates cutting into the bundle with field installed sensors. The sensor can be inserted through more than five ninety degree bends without problems.

MODEL NUMBER	DESCRIPTION
G2S	1/4" x 0.030 PFA
HS3	3/8" x 0.062 PFA



## RTD KIT

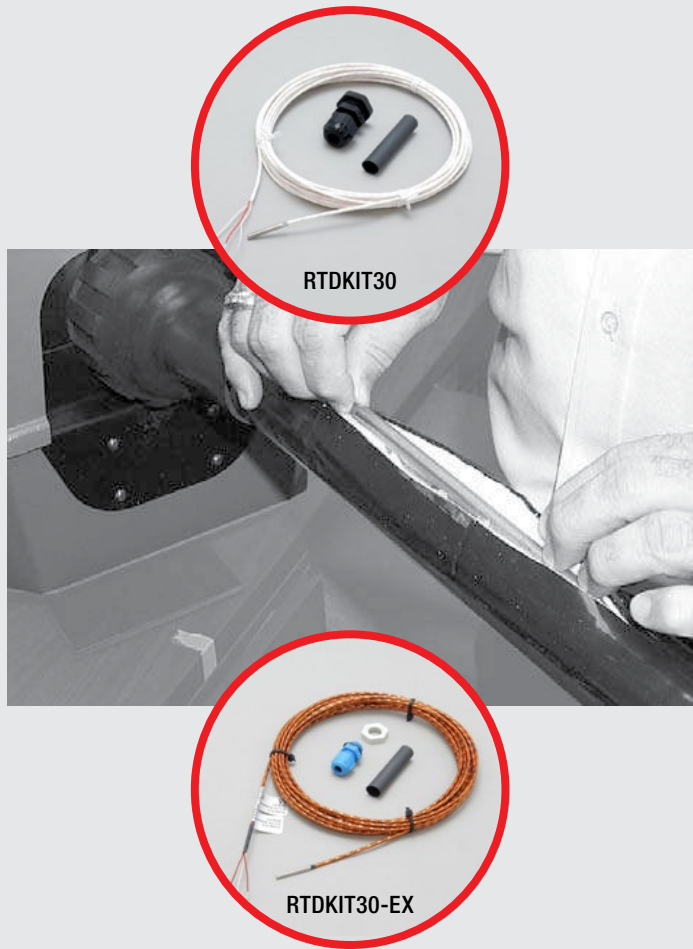
RTD Kits include a 100 Ohm PT100, 3 wire sensor with 30ft leads and an entry seal. Use single RTD with G2S and dual RTDs with H3S SensorTube.

Three Sensor Types:  
1. Power 2. Probe 3. Temperature

MODEL NUMBER	DESCRIPTION
RTDKIT30	NEC/CEC standards with 30' fluoropolymer
RTDKIT30-EX	ATEX II 2 G Ex e IIC T6..T1 Gb and IECEx Ex IIC T6..T1 Gb standards with 9 meter Kapton jacketed leads

### FACTORY INSTALLED RTD

O'Brien can provide an RTD that is embedded in the heated core of the line. These are typically installed 20' from the power end and they will be clearly marked with the sensor location.



ACCESSORIES:

# TEMPERATURE CONTROL

## 10380 SERIES CONTROLLER

The 10380 Series Controller is a compact, fullfeatured, touch screen based, single-point heattracing controller. It provides control and monitoring of Electric Heat Tracing (EHT) circuits for both freeze protection and process temperature maintenance. This controller can monitor and alarm on high and low temperature, high and low current, ground-fault levels, voltage. RTD input is standard, otherwise a thermocouple can be used in conjunction with a signal converter. Up to 4 signal converters can be housed in each junction box. This controller holds global approvals for use in hazardous areas.

MODEL NUMBER	DESCRIPTION
10380-002	10380 Series Controller with FRP Enclosure
10380-004	10380 Series Controller with Stainless Steel Enclosure
10380-JB	Junction box for thermocouple signal converters
10380-TYPE-K	Type K Signal Converter
10380-TYPE-J	Type J Signal Converter



The **STACKPAK™** design request form is available online at:  
<https://www.obcorp.com/-/media/ametektobrien/documents/literature/how-to-order/stackpakrequest.pdf>

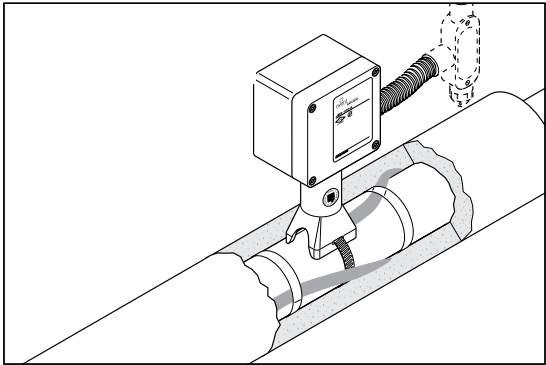
ACCESSORIES:

# POWER CONNECTION KIT

## SINGLE ENTRY POWER CONNECTION KIT

Power connection kit for use with any wattage J, P, BR, NR, VT, VH, JV or JN tracer. Includes junction box and bundle mounting bracket with adjustable straps. Junction box also includes surface mounting feet.

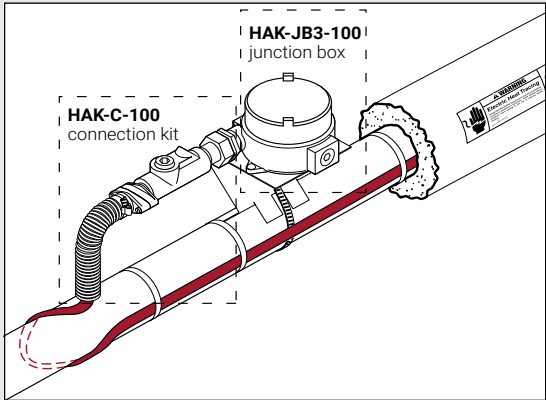
MODEL NUMBER	DESCRIPTION
T210-PC	CSA/FM C1D2 Approved Power Connection
JBS-100-E	Zone 1 and 2 Approved Power Connection



## CLASS 1 DIV 1 POWER CONNECTION KIT

CSA and FM Certified Class I Div. 1 power connection or end termination kit for use with any wattage J, P, BR, NR, VT, VH, JV, or JN tracer. Installs in separately supplied junction box with 3/4" npt hub.

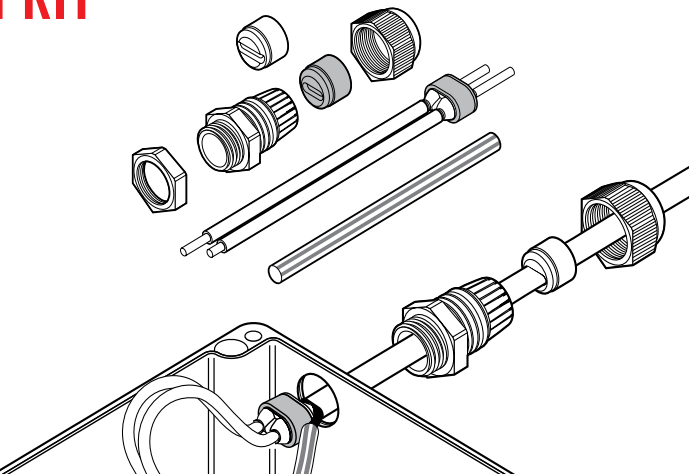
MODEL NUMBER	DESCRIPTION
HAK-C-100	CSA/FM C1D1 Approved Power Connection kit
HAK-JB3-100	CSA/FM C1D1 Approved Junction Box
263757-000	Universal Pipe Mounting Bracket



## COLD APPLIED POWER CONNECTION KIT

ATEX standards approved power connection kit for use with any wattage J, P, BR, NR, VT, VH, JV or JN tracer. For use with customer supplied junction box.

MODEL NUMBER	DESCRIPTION
T9355-PC	Zone 1 and 2 Approved Power Connection



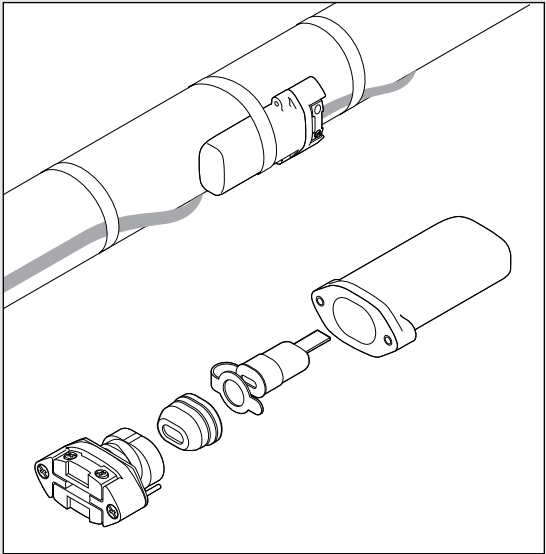
ACCESSORIES:

# END TERMINATION KITS

## LOW PROFILE TERMINATION KIT

FM Approved and CSA Certified Class I Div. 2, and ATEX EEx ell listed electric tracer termination kit for use with any wattage J, P, BR, or NR, tracer.

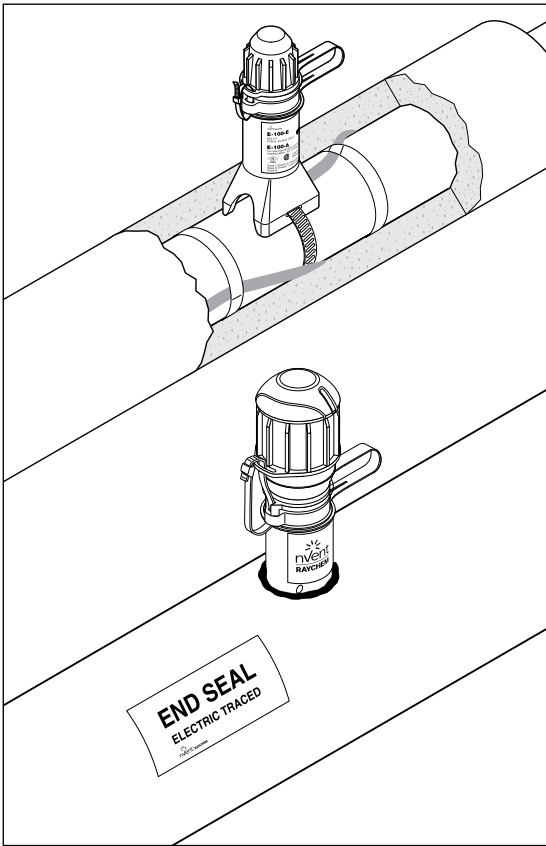
MODEL NUMBER	DESCRIPTION
T210-ET	CSA/FM C1D2 Approved Termination Kit



## HIGH TEMP TERMINATION KIT

A re-enterable and accessible electric tracer termination kit for use with any wattage J, P, BR, NR, VT, VH, JV or JN tracer.

MODEL NUMBER	DESCRIPTION
T250-ET	CSA/FM C1D2 Approved, without light
E-100-L-A	CSA/FM C1D2 Approved, with light
E-100-E	Zone 1 and 2 Approved, without light
E-100-L-E	Zone 1 and 2 Approved, with light





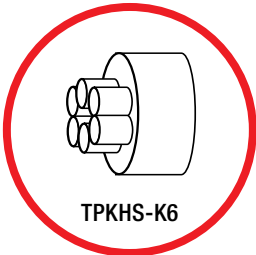
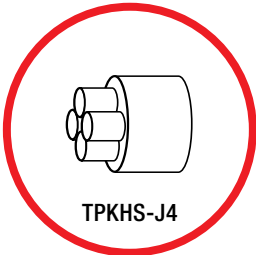
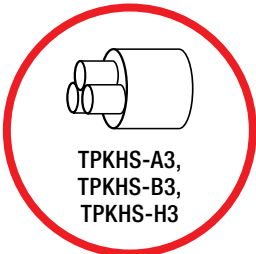
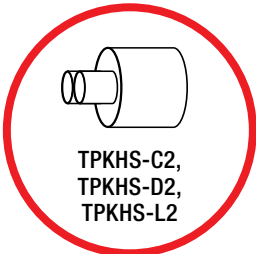
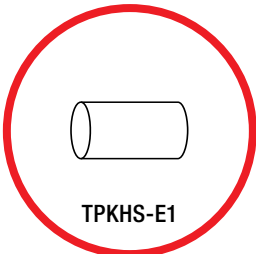
ACCESSORIES:

# SEALING THE ENDS

## HEAT SHRINK BOOTS

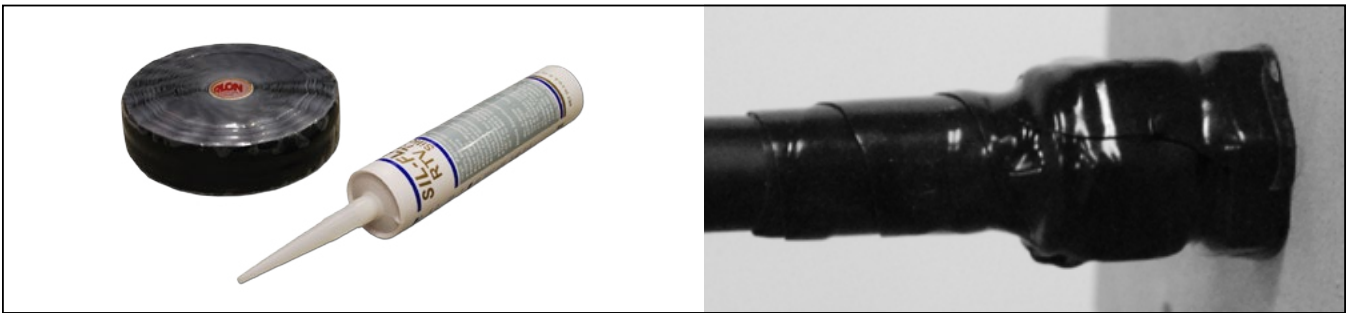
The heat-shrinkable boots provide a weatherproof end seal for STACKPAK™ tubing bundles. They are made of thermally stabilized, modified polyolefin. Using a heat shrink end seal boot is recommended for all exposed ends. This installation will provide the best weather seal protection. Heat shrink boots have 400°F maximum exposure rating.

Add an "S" suffix on any of the below part numbers to further reduce the minimum leg diameter by 0.25". For example, TPKHS-A3S matches TPKHS-A3 specs, except the minimum leg diameter becomes 0.25". This is particularly useful for larger OD bundles with smaller OD tubing.



MODEL NUMBER	MIN. BODY DIAMETER	MAX. BODY DIAMTER	MIN. LEG DIAMETER	MAX. LEG DIAMTER
TPKHS-E1	0.375" (9mm)	1.30" (33mm)	—	—
TPKHS-C2	0.95" (24mm)	1.90" (48mm)	0.30" (8mm)	0.75" (19mm)
TPKHS-D2	0.45" (11mm)	1.60" (40mm)	0.15" (4mm)	0.55" (14mm)
TPKHS-L2	1.50" (38mm)	3.00" (75mm)	0.50" (12mm)	1.50" (38mm)
TPKHS-A3	1.40" (36mm)	2.40" (60mm)	0.50" (12mm)	1.13" (28mm)
TPKHS-B3	0.90" (22mm)	1.70" (43mm)	0.30" (8mm)	0.80" (20mm)
TPKHS-H3	2.00" (50mm)	3.20" (80mm)	0.75" (19mm)	1.40" (35mm)
TPKHS-J4	1.40" (36mm)	2.65" (67mm)	0.43" (11mm)	1.20" (30mm)
TPKHS-K6	1.45" (37mm)	2.40" (61mm)	0.35" (9mm)	0.80" (20mm)

## SILICONE SEALANT & SELF BONDING SILICONE TAPE



### SILICONE SEALANT

This option is used to seal both ends of the tubing bundle from moisture. It is a black silicone RTV sealant. Cure time is approximately 24 hours at 77°F (25°C). Service temperature ranges from -62°F (-52°C) to 650°F (345°C). TPKSK offers excellent resistance to weather, oil and many chemicals.

MODEL NUMBER	DESCRIPTION
TPKSK-10	400F continuous / 450F intermittent RTV Sealant, 10 oz. will seal approximately 10 ends
TPKSK-10H	500F continuous / 650F intermittent RTV Sealant, 10 oz. will seal approximately 10 ends

### SELF BONDING SILICONE TAPE

This option is used to seal both ends of the tubing bundle from moisture. It is a black silicone, self bonding.

MODEL NUMBER	DESCRIPTION
TPKJP-SR-B	Self Bonding Tape, 36 yd (33m)
TPKJP-SR-B10	Self Bonding Tape, 10ft (3m)
TPKSK-SRT-10	Cold applied end seal kit. 10oz RTV sealant and one 36 yard roll of black self-fusing silicone tape
TPKSK-SRT-10H	High temp cold applied end seal kit. 10oz HT-RTV sealant and one 36 yard roll of black self-fusing silicone tape. Rated 500F continuous / 600F intermittent.

## HIGH TEMPERATURE END SEALS

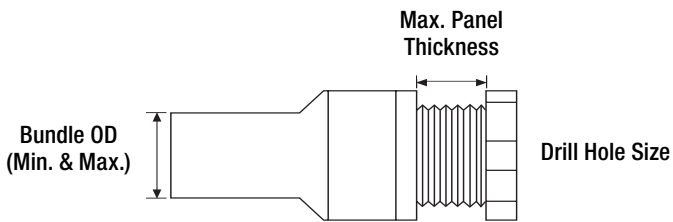
The new and improved O'Brien High Temp End Seal (HTES) is used primarily for STACKPAK™ isolated tracer tubing bundle designs, MI cable, or high temperature exposure STACKPAK bundles above our standard 400°F exposure temperature. The modular design allows for many configurations with or without electric tracer, and up to 2 tubes. The integrated heat shrink flange allows for quicker and consistent installation and further guarantees weather protection.



HEAT SHRINK ENTRY SEALS

The heat-shrinkable entry seal provides a waterproof fitting where STACKPAK™ enters an enclosure. They can be added to parting line or surface mounted plates on VIPAK® enclosures. The thermally stabilized, modified polyolefin entry seal consists of a threaded assembly that seals at the enclosure and a heat-shrinkable nose that seals to the STACKPAK bundle.

**NOTE:** Consult VIPAK brochure for entry seals to be used with VIPAK instrument enclosures.

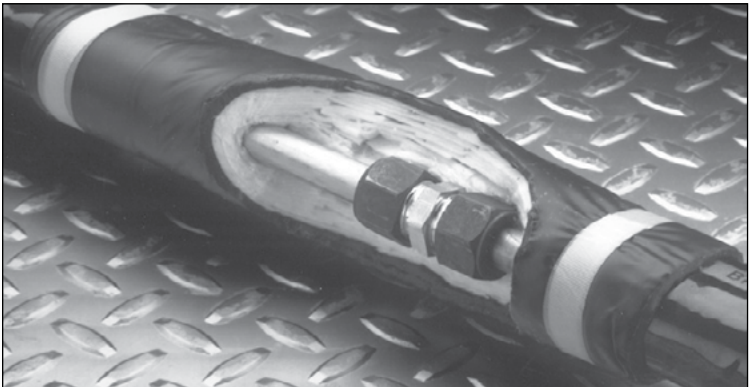


MODEL NUMBER	MIN. BUNDLE OD	MAX. BUNDLE OD	MAX. PANEL THICKNESS	DRILL HOLE SIZE
TPKES-4	0.75" (19mm)	1.60" (40mm)	0.50" (12mm)	2.00" (51mm)
ES4	0.75" (19mm)	1.60" (40mm)	1.60" (40mm)	2.00" (51mm)
TPKES-4S	0.75" (19mm)	2.10" (53mm)	0.50" (19mm)	2.375" (60mm)
ES4S	0.75" (19mm)	2.10" (53mm)	1.60" (40mm)	2.375" (60mm)
TPKES-5	1.43" (36mm)	2.90" (74mm)	0.75" (19mm)	3.50" (90mm)
ES5	1.43" (36mm)	2.75" (70mm)	1.95" (50mm)	3.38" (86mm)
ES6X	1.43" (36mm)	3.50" (90mm)	1.75" (25mm)	4.50" (114mm)
ES7X	2.25" (57mm)	4.00" (102mm)	1.25" (25mm)	5.50" (140mm)

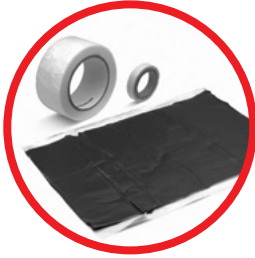


JACKET PATCH KITS

The jacket patch kits are used to seal a splice in a bundle or to extend the insulation and weatherproof jacket should the bundle be cut back too far during installation. They are used as a repair patch for any incidental field damage to bundles. The jacket patch kit is required with the optional line temperature sensing thermostat. Each kit contains thermal insulation, fiberglass tape and a self-sealing patch.



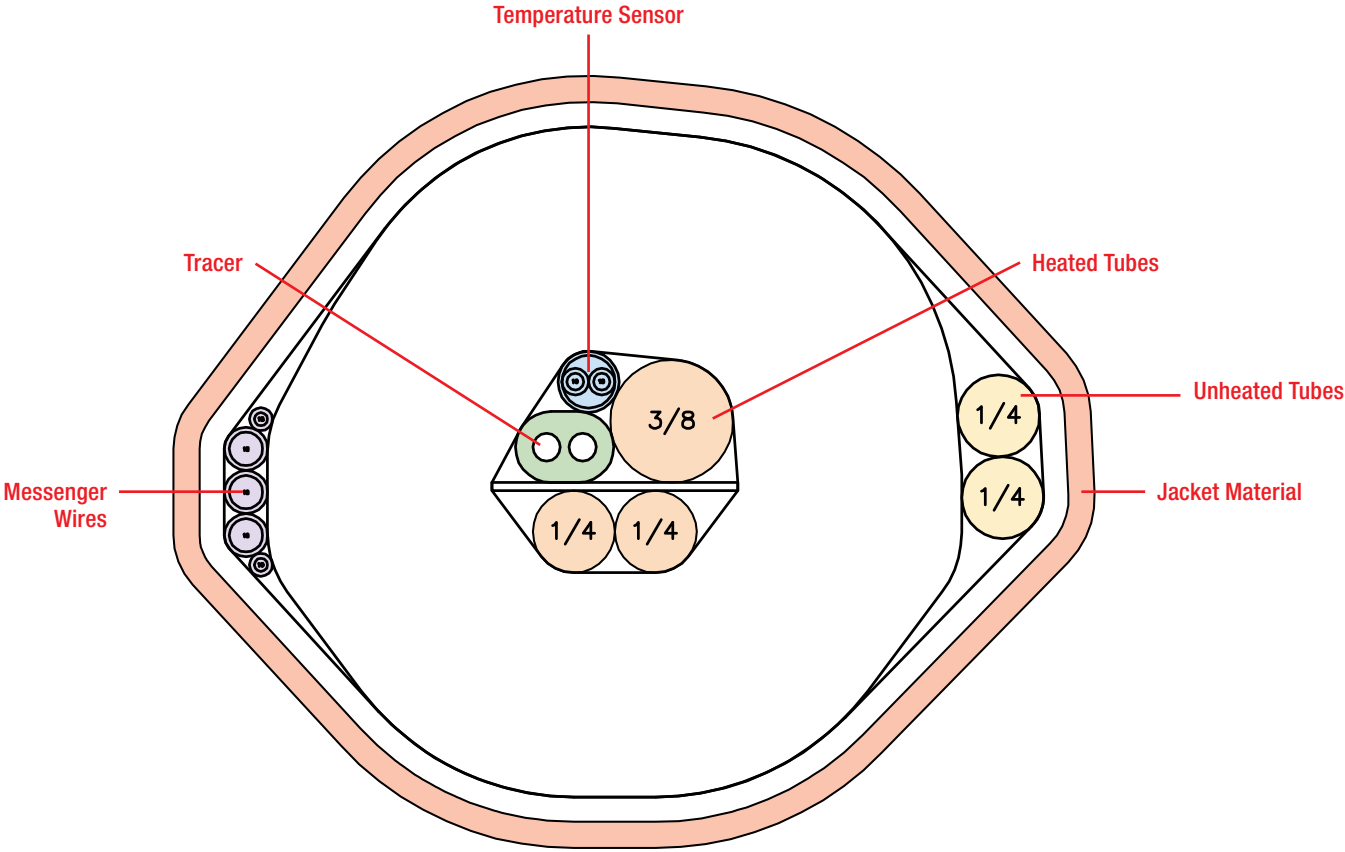
	BUNDLES UP TO 400°F (204°C)	BUNDLES UP TO 1150°F (590°C)
Small 8" x 12"	TPKJP-1	TPKJP-3
Large 8" x 96"	TPKJP-2	TPKJP-4



The STACKPAK™ design request form is available online at: <https://www.obcorp.com/-/media/ametektobrien/documents/literature/how-to-order/stackpakrequest.pdf>



STACKPACK™ PART NUMBER



IF YOU HAVE A 'Z' IN THE MODEL NUMBER

Some designs may contain tubes, tracers and other components not listed. These components will be designated by a “Z” in the model number and are defined in the packing list accompanying the shipment.

ELECTRIC CONNECTIONS & TERMINATIONS

Electric tracers must be connected and terminated using approved power connection and termination kits. See instructions provided with the power connection kit.

Base Model									Special Options					Ender	
UNIT	PRODUCT	JACKET	-	HEATED TUBES	/	UNHEATED TUBES	-	TRACER	/	LENGTH	TEMP SENSOR	WIRES	JACKET COLOR	CROSS HEAD	IDENTIFIER
UNIT OF MEASURE															
—	Feet														
M/	Meters														
M/	PRODUCT DESIGNATOR														
	S	STACKPAK Designation													
	JACKET MATERIAL														
	S	SV47 (O'Brien PVC)													
	U	TPU (Thermoplastic polyurethane)													
	- Separator														
	HEATED TUBES														
	X#	See tube list for tube codes. For multiple heated tubes of the same kind, add parenthesis with number of tubes, for example F2(2) is qty(2) F2 tubes. For different tubes together, add one code one after the other, for example F2(2)F3 is qty(2) F2, and qty(1) F3 tubes.													
	/ Separator only if unheated tubes are present.														
	UNHEATED TUBES														
	X#	See tube list for tube codes. For multiple heated tubes of the same kind, add parenthesis with number of tubes, for example F2(2) is qty(2) F2 tubes. For different tubes together, add one code one after the other, for example F2(2)F3 is qty(2) F2, and qty(1) F3 tubes.													
	- Separator														
	TRACER														
	X#	See tracer list for tracer codes.													
	/ Separator between each option, only if special options are present.														
	LENGTH														
	XXX	Exact and continuous length only for bundles not sold per length. If part starts with M/ this will be in meters, otherwise in feet.													
	TEMPERATURE SENSOR — FACTORY INSTALLED														
	X##	J = Type J Thermocouple K = Type K Thermocouple R = PT100 3 wire RTD ## = distance from power end													
	MESSENGER WIRES														
	#M	# = number of wires in unheated section of bundle. e.g. /3M indicates 3 messenger wires.													
	JACKET COLORS														
	X	See jacket data page for color options.													
	LARGE CROSS-HEAD														
	LC	Indicates large cross-head is required													
	UNIQUE IDENTIFIER														
	-XXXXX	Unique numerical identifier for each bundle design.													
M/	S	S	-	F2(2)	/	H3S2	-	T18	/	030	/J50	/5M	/G	/LC	-123456 Example

# TUBE LIST

CODE	OD	WALL	MATERIAL
A1	1/8"	0.035"	316/316L SS AVG WALL WLD
A2	1/4"	0.035"	316/316L SS AVG WALL WLD
A3	3/8"	0.035"	316/316L SS AVG WALL WLD
A4	1/2"	0.035"	316/316L SS AVG WALL WLD
A6	3/4"	0.035"	316/316L SS AVG WALL WLD
E2	1/4"	0.035"	316/316L SS AVG WALL WLD
E3	3/8"	0.049"	316/316L SS AVG WALL WLD
E4	1/2"	0.049"	316/316L SS AVG WALL WLD
E6	3/4"	0.049"	316/316L SS AVG WALL WLD
U4	1/2"	0.065"	316/316L SS AVG WALL WLD
U6	3/4"	0.065"	316/316L SS AVG WALL WLD
FA1	1/8"	0.020"	316/316L SS AVG WALL SMLS
FL1	1/8"	0.028"	316/316L SS AVG WALL SMLS
F1	1/8"	0.035"	316/316L SS AVG WALL SMLS
F2	1/4"	0.035"	316/316L SS AVG WALL SMLS
F25	5/16"	0.035"	316/316L SS AVG WALL SMLS
F3	3/8"	0.035"	316/316L SS AVG WALL SMLS
F4	1/2"	0.035"	316/316L SS AVG WALL SMLS
B2	1/4"	0.049"	316/316L SS AVG WALL SMLS
B3	3/8"	0.049"	316/316L SS AVG WALL SMLS
B4	1/2"	0.049"	316/316L SS AVG WALL SMLS
B6	3/4"	0.049"	316/316L SS AVG WALL SMLS
K2	1/4"	0.065"	316/316L SS AVG WALL SMLS
K3	3/8"	0.065"	316/316L SS AVG WALL SMLS
K4	1/2"	0.065"	316/316L SS AVG WALL SMLS
K6	3/4"	0.065"	316/316L SS AVG WALL SMLS
K8	1"	0.065"	316/316L SS AVG WALL SMLS
W2	1/4"	0.083"	316/316L SS AVG WALL SMLS
W3	3/8"	0.083"	316/316L SS AVG WALL SMLS
W4	1/2"	0.083"	316/316L SS AVG WALL SMLS
W6	3/4"	0.083"	316/316L SS AVG WALL SMLS
FW2	1/4"	0.035"	316/316L SS MIN WALL SMLS
FW3	3/8"	0.035"	316/316L SS MIN WALL SMLS
FW4	1/2"	0.035"	316/316L SS MIN WALL SMLS
BW2	1/4"	0.049"	316/316L SS MIN WALL SMLS
BW3	3/8"	0.049"	316/316L SS MIN WALL SMLS
BW4	1/2"	0.049"	316/316L SS MIN WALL SMLS
BW6	3/4"	0.049"	316/316L SS MIN WALL SMLS
KW2	1/4"	0.065"	316/316L SS MIN WALL SMLS
KW3	3/8"	0.065"	316/316L SS MIN WALL SMLS
KW4	1/2"	0.065"	316/316L SS MIN WALL SMLS
KA2	1/4"	0.065"	316H SS AVG WALL SMLS
KA3	3/8"	0.065"	316H SS AVG WALL SMLS

CODE	OD	WALL	MATERIAL
KA4	1/2"	0.065"	316H SS AVG WALL SMLS
WA3	3/8"	0.083"	316H SS AVG WALL SMLS
WA4	1/2"	0.083"	316H SS AVG WALL SMLS
BH2	1/4"	0.049"	316H SS MIN WALL SMLS
BH3	3/8"	0.049"	316H SS MIN WALL SMLS
BH4	1/2"	0.049"	316H SS MIN WALL SMLS
KH2	1/4"	0.065"	316H SS MIN WALL SMLS
KH3	3/8"	0.065"	316H SS MIN WALL SMLS
KH4	1/2"	0.065"	316H SS MIN WALL SMLS
AE2	1/4"	0.035"	304L SS AVG WALL WLD
AE3	3/8"	0.035"	304L SS AVG WALL WLD
AE4	1/2"	0.035"	304L SS AVG WALL WLD
UA4	1/2"	0.065"	304L SS AVG WALL WLD
UA6	3/4"	0.065"	304L SS AVG WALL WLD
UB4	1/2"	0.049"	304L SS AVG WALL WLD
UB6	3/4"	0.049"	304L SS AVG WALL WLD
J2	1/4"	0.030"	B68/B75 COPPER SMLS
C3	3/8"	0.032"	B68/B75 COPPER SMLS
D3	3/8"	0.035"	B68/B75 COPPER SMLS
D4	1/2"	0.035"	B68/B75 COPPER SMLS
M3	3/8"	0.049"	B68/B75 COPPER SMLS
M4	1/2"	0.049"	B68/B75 COPPER SMLS
M6	3/4"	0.049"	B68/B75 COPPER SMLS
G2S	1/4"	0.030"	PFA EXTRUDED BLK SENSORTUBE
G3S	3/8"	0.030"	PFA EXTRUDED BLK SENSORTUBE
H3S	3/8"	0.062"	PFA EXTRUDED BLK SENSORTUBE
G1	1/8"	0.030"	PFA EXTRUDED
G2	1/4"	0.030"	PFA EXTRUDED
G3	3/8"	0.030"	PFA EXTRUDED
G4	1/2"	0.030"	PFA EXTRUDED
S2	1/4"	0.040"	PFA EXTRUDED
S3	3/8"	0.040"	PFA EXTRUDED
S4	1/2"	0.040"	PFA EXTRUDED
V2	1/4"	0.047"	PFA EXTRUDED
V3	3/8"	0.047"	PFA EXTRUDED
V4	1/2"	0.047"	PFA EXTRUDED
H2	1/4"	0.062"	PFA EXTRUDED
H3	3/8"	0.062"	PFA EXTRUDED
H4	1/2"	0.062"	PFA EXTRUDED
H5	5/8"	0.062"	PFA EXTRUDED
H6	3/4"	0.062"	PFA EXTRUDED
L2	1/4"	0.047"	FEP EXTRUDED
L3	3/8"	0.047"	FEP EXTRUDED

CODE	OD	WALL	MATERIAL
LA2	1/4"	0.040"	PTFE EXTRUDED
LB3	3/8"	0.062"	PTFE EXTRUDED
LB4	1/2"	0.062"	PTFE EXTRUDED
RH3	3/8"	0.0625"	HDPE EXTRUDED
RH4	1/2"	0.0625"	HDPE EXTRUDED
RS2	1/4"	0.040"	HDPE EXTRUDED
AA1	1/8"	0.020"	ALLOY 825 AVG WALL SMLS
AB2	1/4"	0.035"	ALLOY 825 AVG WALL SMLS
AB3	3/8"	0.035"	ALLOY 825 AVG WALL SMLS
AB4	1/2"	0.035"	ALLOY 825 AVG WALL SMLS
AC4	1/2"	0.065"	ALLOY 825 AVG WALL SMLS
AY2	1/4"	0.049"	ALLOY 825 AVG WALL SMLS
AY3	3/8"	0.049"	ALLOY 825 AVG WALL SMLS
AY4	1/2"	0.049"	ALLOY 825 AVG WALL SMLS
AY6	3/4"	0.049"	ALLOY 825 AVG WALL SMLS
AP2	1/4"	0.035"	ALLOY 2507 AVG WALL SMLS
AP3	3/8"	0.035"	ALLOY 2507 AVG WALL SMLS
AP4	1/2"	0.035"	ALLOY 2507 AVG WALL SMLS
AQ2	1/4"	0.049"	ALLOY 2507 AVG WALL SMLS
AQ3	3/8"	0.049"	ALLOY 2507 AVG WALL SMLS
AQ4	1/2"	0.049"	ALLOY 2507 AVG WALL SMLS
AR2	1/4"	0.065"	ALLOY 2507 AVG WALL SMLS
AR3	3/8"	0.065"	ALLOY 2507 AVG WALL SMLS
AR4	1/2"	0.065"	ALLOY 2507 AVG WALL SMLS
N2	1/4"	0.035"	ALLOY 400 AVG WALL SMLS
N3	3/8"	0.035"	ALLOY 400 AVG WALL SMLS
N4	1/2"	0.035"	ALLOY 400 AVG WALL SMLS
P2	1/4"	0.049"	ALLOY 400 AVG WALL SMLS
P4	1/2"	0.049"	ALLOY 400 AVG WALL SMLS
FB2	1/4"	0.035"	ALLOY C276 AVG WALL SMLS
FB3	3/8"	0.035"	ALLOY C276 AVG WALL SMLS
FB4	1/2"	0.035"	ALLOY C276 AVG WALL SMLS
BB4	1/2"	0.049"	ALLOY C276 AVG WALL SMLS
MA6	6mm	1mm	316/316L SS AVG WALL WLD
MA8	8mm	1mm	316/316L SS AVG WALL WLD
MA10	10mm	1mm	316/316L SS AVG WALL WLD
MA12	12mm	1mm	316/316L SS AVG WALL WLD
MF6	6mm	1mm	316/316L SS AVG WALL SMLS
MF8	8mm	1mm	316/316L SS AVG WALL SMLS
MF10	10mm	1mm	316/316L SS AVG WALL SMLS
MF12	12mm	1mm	316/316L SS AVG WALL SMLS
MB10	10mm	1.5mm	316/316L SS AVG WALL SMLS
MB12	12mm	1.5mm	316/316L SS AVG WALL SMLS

CODE	OD	WALL	MATERIAL
MR14	14mm	1.6mm	316/316L SS AVG WALL SMLS
MH6	6mm	1mm	316L SS 6% MOLY SMLS
ML10	10mm	2mm	316L SS 6% MOLY SMLS
ML12	12mm	1mm	316L SS 6% MOLY SMLS
MD6	6mm	2mm	B68/B75 COPPER SMLS
MD8	8mm	1mm	B68/B75 COPPER SMLS
MD10	10mm	1mm	B68/B75 COPPER SMLS
MD12	12mm	1mm	B68/B75 COPPER SMLS
MG10	10mm	1mm	PFA EXTRUDED
MG12	12mm	1mm	PFA EXTRUDED
MG6	6mm	1mm	PFA EXTRUDED
MG8	8mm	1mm	PFA EXTRUDED
MP6	12mm	1mm	ALLOY 825 AVG WALL SMLS
MP10	10mm	1mm	ALLOY 825 AVG WALL SMLS
MP12	12mm	1mm	ALLOY 825 AVG WALL SMLS
MQ12	12mm	1.5mm	ALLOY 825 AVG WALL SMLS
MC6	6mm	1mm	ALLOY 2507 AVG WALL SMLS
ME10	10mm	1mm	ALLOY 2507 AVG WALL SMLS
ME12	12mm	1mm	ALLOY 2507 AVG WALL SMLS
ME6	6mm	1.5mm	ALLOY 2507 AVG WALL SMLS
ME10	10mm	1.5mm	ALLOY 2507 AVG WALL SMLS
ME12	12mm	1.5mm	ALLOY 2507 AVG WALL SMLS
MT12	12mm	1mm	316Ti SS AVG WALL WLD
MV6	6mm	1mm	317 SS AVG WALL SMLS

## TRUETUBE®

CODE	OD	WALL	MATERIAL
TE1	1/8"	0.020"	316/316L EP 20µin Ra max ID
TE2	1/4"	0.035"	316/316L EP 20µin Ra max ID
TE3	3/8"	0.035"	316/316L EP 20µin Ra max ID
TE4	1/2"	0.049"	316/316L EP 20µin Ra max ID
MTE6	6mm	1mm	316/316L EP 20µin Ra max ID



# TRACER LIST

O'BRIEN TRACER DESIGNATOR	TYPE	WATTAGE PER FOOT @ 50F/10C	VOLTAGE RANGE VAC	MAXIMUM MAINTAIN/CONTINUOUS EXPOSURE F/C	MAXIMUM INTERMITTENT EXPOSURE F/C
J3	Self Regulating	3	100-130	150/65	185/85
J5	Self Regulating	5	100-130	150/65	185/85
J8	Self Regulating	8	100-130	150/65	185/85
J10	Self Regulating	10	100-130	150/65	185/85
P3	Self Regulating	3	200-277	150/65	185/85
P5	Self Regulating	5	200-277	150/65	185/85
P8	Self Regulating	8	200-277	150/65	185/85
P10	Self Regulating	10	200-277	150/65	185/85
BR5	Self Regulating	5	100-130	302/150	482/250
BR10	Self Regulating	10	100-130	302/150	482/250
BR15	Self Regulating	15	100-130	302/150	482/250
BR20	Self Regulating	20	100-130	302/150	482/250
NR3	Self Regulating	3	200-277	302/150	482/250
NR5	Self Regulating	5	200-277	302/150	482/250
NR8	Self Regulating	8	200-277	302/150	482/250
NR10	Self Regulating	10	200-277	302/150	482/250
NR12	Self Regulating	12	200-277	302/150	482/250
NR15	Self Regulating	15	200-277	302/150	482/250
NR20	Self Regulating	20	200-277	302/150	482/250
VT5	Self Regulating	5	100-130	400/205	500/260
VT10	Self Regulating	10	100-130	400/205	500/260
VT15	Self Regulating	15	100-130	400/205	500/260
VT20	Self Regulating	20	100-130	400/205	500/260
VH3	Self Regulating	3	200-277	400/205	500/260
VH5	Self Regulating	5	200-277	400/205	500/260
VH8	Self Regulating	8	200-277	400/205	500/260
VH10	Self Regulating	10	200-277	400/205	500/260
VH12	Self Regulating	2	200-277	400/205	500/260
VH15	Self Regulating	15	200-277	400/205	500/260
VH20	Self Regulating	20	200-277	400/205	500/260
VH28	Self Regulating	28	200-277	400/205	500/260
JV5	Power Limiting/Zone style	5	100-120	445/230	N/A
JV10	Power Limiting/Zone style	10	100-120	400/205	N/A
JV15	Power Limiting/Zone style	15	100-120	335/170	N/A
JV20	Power Limiting/Zone style	20	100-120	300/150	N/A
JN5	Power Limiting/Zone style	5	208	445/230	N/A
	Power Limiting/Zone style	5	230	445/230	N/A
	Power Limiting/Zone style	5	240	445/230	N/A
	Power Limiting/Zone style	5	277	435/225	N/A

O'BRIEN TRACER DESIGNATOR	TYPE	WATTAGE PER FOOT @ 50F/10C	VOLTAGE RANGE VAC	MAXIMUM MAINTAIN/CONTINUOUS EXPOSURE F/C	MAXIMUM INTERMITTENT EXPOSURE F/C
JN10	Power Limiting/Zone style	10	208	425/220	N/A
	Power Limiting/Zone style	10	230	410/210	N/A
	Power Limiting/Zone style	10	240	400/205	N/A
	Power Limiting/Zone style	10	277	383/195	N/A
JN15	Power Limiting/Zone style	15	208	390/200	N/A
	Power Limiting/Zone style	15	230	356/180	N/A
	Power Limiting/Zone style	15	240	335/170	N/A
	Power Limiting/Zone style	15	277	221/105	N/A
JN20	Power Limiting/Zone style	20	208	300/150	N/A
	Power Limiting/Zone style	20	230	300/150	N/A
	Power Limiting/Zone style	20	240	300/150	N/A
T18	Constant Watt/Zone Style	18	120	400/205	N/A
TY18	Constant Watt/Zone Style	18	208	400/205	N/A
TN18	Constant Watt/Zone Style	18	240	400/205	N/A

The STACKPAK™ design request form is available online at:  
<https://www.obcorp.com/-/media/ametektobrien/documents/literature/how-to-order/stackpakrequest.pdf>



## ISO 9001 CERTIFIED

O'Brien has passed the latest ISO 9001 certification. O'Brien has consistently adhered to recognized international quality standards to ensure the highest quality of our products.

## CUSTOMER-CENTERED

O'Brien, your trusted thermal processing equipment supplier, is committed to providing customer-focused solutions. We provide first-class customer service, including fast-response, knowledgeable employees, competitive delivery cycles, reliable, time-tested products.



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