



Product Catalogue

# Food & beverage conduit systems Anti-microbial cable protection



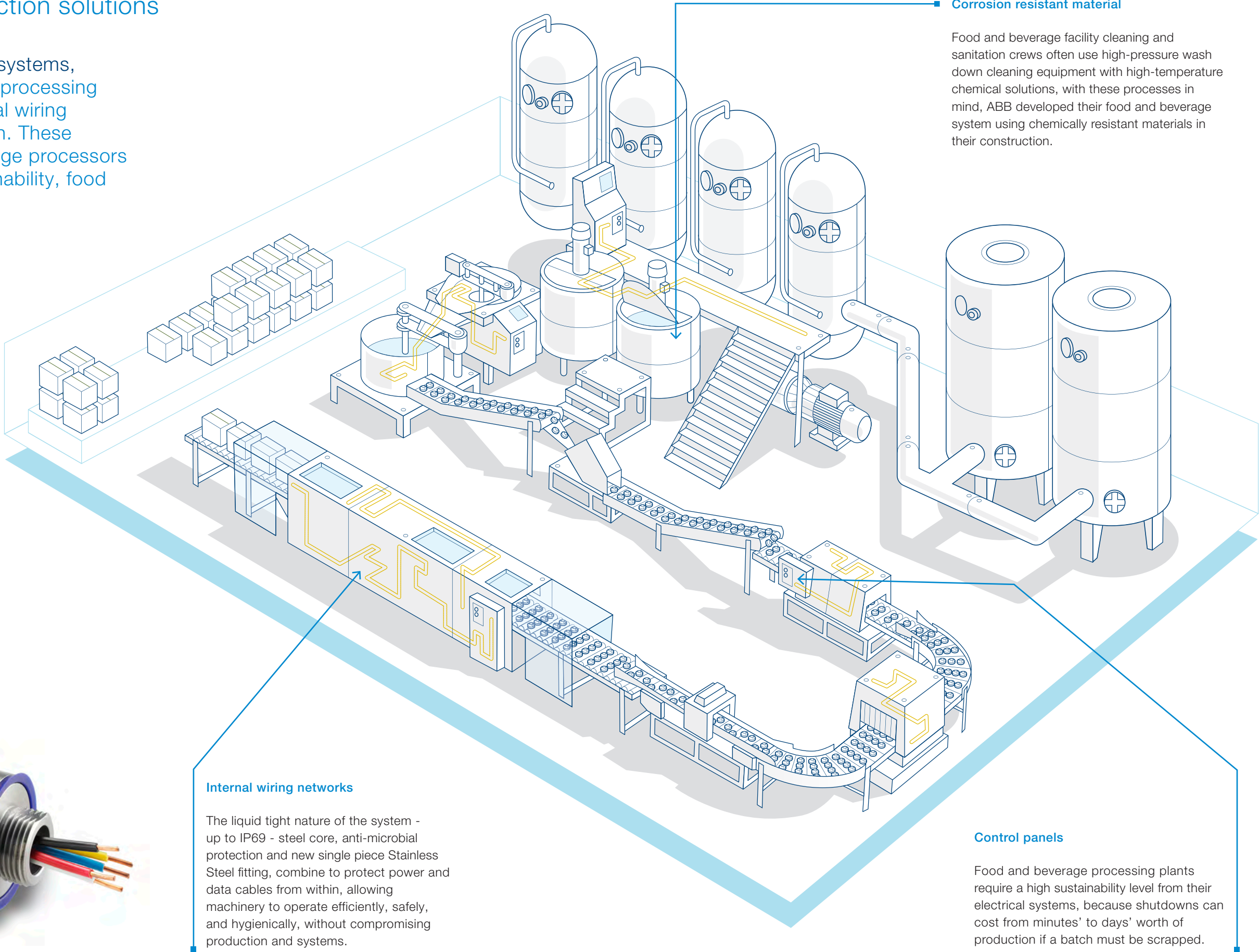
# ABB food and beverage conduit systems

## Anti-microbial cable protection solutions

ABB food and beverage conduit systems, are designed to protect complex processing equipment with sensitive electrical wiring systems, controls and automation. These solutions enable food and beverage processors to increase revenue, plant sustainability, food safety and brand equity.

Given the volume of mechanical process equipment involved in the food and beverage industry combined with the shift towards increased automation through conveyor and feeder systems, there are often thousands of power and data cables that need to be protected. However, cable protection systems like conduits and fittings, can in themselves become a home for bacteria and pose a potential threat in food processing.

The solution created with technology partner BioCote, is to integrate anti-microbial protection in to a new generation of liquid tight conduit. Featuring a smooth, FDA, EC and FSA compliant DuPont Hytrel® thermoplastic jacket, the conduit is complimented by an industry first, single piece liquid tight 316 Stainless Steel fitting. The new system poses a viable alternative to other types of conduit systems and is perfectly suited for the protection of processing equipment and surrounding process area.



### Internal wiring networks

The liquid tight nature of the system - up to IP69 - steel core, anti-microbial protection and new single piece Stainless Steel fitting, combine to protect power and data cables from within, allowing machinery to operate efficiently, safely, and hygienically, without compromising production and systems.

### Corrosion resistant material

Food and beverage facility cleaning and sanitation crews often use high-pressure wash down cleaning equipment with high-temperature chemical solutions, with these processes in mind, ABB developed their food and beverage system using chemically resistant materials in their construction.

### Control panels

Food and beverage processing plants require a high sustainability level from their electrical systems, because shutdowns can cost from minutes' to days' worth of production if a batch must be scrapped.



## When clean just isn't clean enough

### Cable protection in the food and beverage industry



## Making the case for anti-microbial cable protection in the food and beverage industry.

The threat of bacterial infection is constant within the food & beverage industry, with mechanical equipment posing a potential area of risk. ABB for Adaptaflex outlines the issue and provides insight into preventing contamination issues.

Health and safety regulations within the food manufacturing industry are notoriously strict and end-users fight a constant battle to ensure that process equipment is operating efficiently, safely, and hygienically, without compromising valuable power and data connections.

Given the volume of mechanical process equipment involved in the food and beverage industry combined with the shift towards increased automation such as conveyor and feeder systems, there are often thousands of power and data cables

that need to be protected. However, cable protection systems like conduits and fittings, can in themselves become a home for bacteria and pose a direct threat to food manufacturing. Stringent health and safety, along with strict infection control measures are required to ensure that bugs, such as listeria, e-coli and salmonella, are killed before they can enter the food production process. As we have seen in recent years, it can take just a single bacterial infection to eradicate decades of consumer trust, crippling a company's finances in the process and miring it in costly litigation battles.

Many different types of conduit systems are used in the food and beverage industry, and these systems are not without their own challenges. It is well known and proven that bacteria can adapt and survive on the various surfaces, meaning a structured and thorough cleaning regime is a must for clean equipment and food safety. Typically, stainless steel equipment is cleaned up to five times a day in order in order to minimize potential infection. The chosen method, typically called wash-down, are high powered jets with or steam or hot water with chemical agents, typically anywhere from 50°C up to circa 130°C.

**'It can take just a single bacterial infection to eradicate decades of consumer trust.'**

The repeated cleaning process can impact the integrity of cables and wiring leading to the need to replace to ensure an effective system. As such, manufacturers periodically carry out maintenance alongside the installation of cable protection conduit systems, to help mitigate the effects of repeated washdown, abrasion, impact and dust and liquid ingress.

Regular cleaning of equipment, including cable protection conduit systems is required, since it only temporarily reduces the threat of infection. However this increases the likelihood of liquid ingress and material corrosion. With a wash-down, the killing of bacteria is instant, but stops once stimulus (high pressure wash and chemicals) is removed and the equipment dries. This causes an obvious tension between the need for a dry environment to prevent water ingress, whilst, in turn, doing what's needed to hamper bacterial growth.

The solution created with technology partner BioCote, is to integrate anti-microbial protection in to a new generation of liquid tight conduit. Featuring a smooth, FDA, EC and FSA compliant DuPont Hytrel® thermoplastic jacket, the conduit is complimented by, an industry first, single piece liquid tight 316 Stainless Steel fitting. The new system poses a viable alternative to other types of conduit systems and is perfectly suited for the protection of processing equipment and surrounding process area.

**'... see the level of bacteria reduced by up to 80% in the first 15 minutes and by 99% in just two hours'**

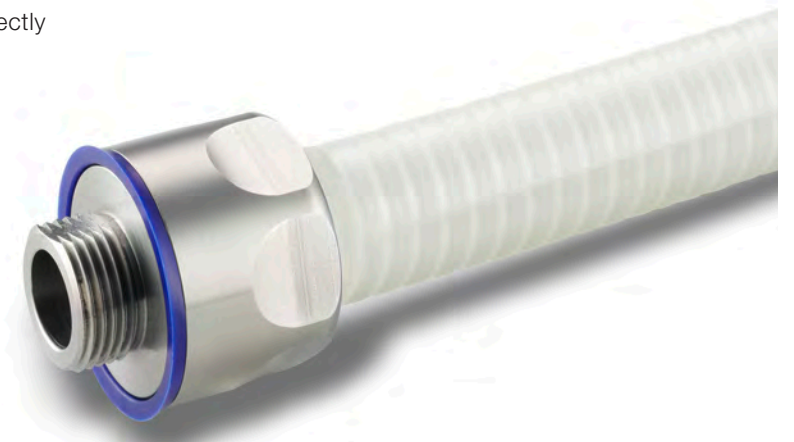
**'The science behind anti-microbial protection is fascinating.'**

The anti-microbial additive contains inert ionic silver, meaning it doesn't react or change the appearance of the final product, additionally the additive won't diminish in extreme temperatures, such as steam or deep freeze. Crucially, the anti-microbial protection will not wear off or wash away, as it is more than just a surface coating, in that it is incorporated to form an integral aspect of the product during manufacture. Most importantly, the bacteria cannot survive contact with the silver ions in the anti-microbial protection, because it in effect turns off the bacteria's basic properties.

The science behind anti-microbial protection is fascinating. The silver ions on the surface of a material treated with anti-microbial additives bind with microbes they come into contact with and irreparably damage them, disrupting their normal cell function, stopping them from reproducing and finally resulting in the death of the cell.

Tests completed by BioCote, see the level of bacteria reduced by up to 80% in the first 15 minutes and by 99% in just two hours. Based on the work and materials BioCote provided to ABB, in addition to in-house testing, it's been proven that the effectiveness of the anti-microbial treatment does not degrade over time, throughout storage, or during repeated wash-downs.

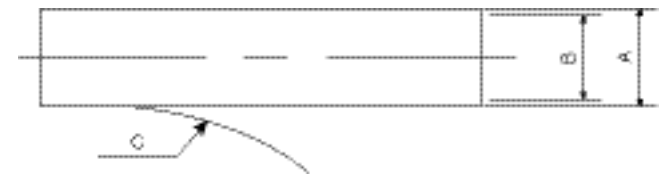
Given the size of the food and beverage market, the ABB's range of food and beverage conduit solutions can offer end-users a quantifiable return on investment and help eliminate the risk of bacterial contamination, which could cost the industry both time and money.





Raising standards of cleanliness in food and beverage


Type SAMHL and SSAMHL - Anti-microbial liquid tight conduit



Anti-microbial liquid tight high temperature covered steel flexible conduit. Suitable for indoor splash zone areas or food processing equipment

Features

- **Type SAMHL** - Galvanized steel core string packed with Anti-microbial protection incorporated into a FDA, EC and FSA compliant DuPont Hytrel® thermoplastic jacket
- **Type SSAMHL** - Stainless steel string with Anti-microbial protection incorporated into a FDA, EC and FSA compliant DuPont Hytrel® thermoplastic jacket
- IP40 - IP69 rated
- Temperature range up to -50°C to +130°C
- Approvals: CE, BS EN 61386-1,-23, NSF 14159-1-2014 & NSF 169-2009.

Approvals


Type SAMHL Conformity
Low voltage directive
NSF14159-1-2014
NSF169-2009
BSI Kitemark KM35161

Type SSAMHL Conformity
Low voltage directive
NSF14159-1-2014
NSF169-2009
BSI Kitemark KM35161

IP Rating	Appropriate Fitting
For use with: Type SAM fitting	
IP40	Yes
IP65	Yes
IP68	Yes (10 bar 30mins)
IP69	Yes

Degree of Mechanical Protection
High corrosion resistance
High fatigue life
High chemical resistance
High flexibility

Fire Performance	
Test Standard	Performance Rating
IEC61386-1	Self Extinguishing

Temperature Range
Static Applications: -50°C to +130°C
Moving Applications: -5°C to +150°C

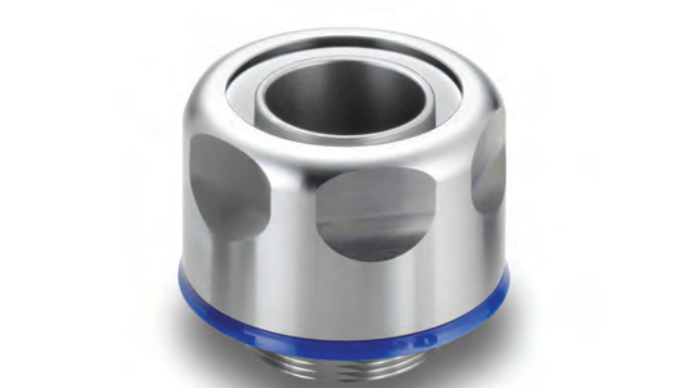
Material
Galvanised steel core with string packing (string packed up to 32mm)
Stainless steel core with string packing (up to 32mm), larger sizes double interlocked
FDA, EC and FSA compliant DuPont Hytrel® thermoplastic jacket
Anti-microbial additive incorporated into Hytrel® jacket

METRIC Part no:	NPT Part no:	Conduit Size		Dimensions			Coil lengths (m)	Coil lengths (m) (SSAMHL)	Coil lengths (ft) (SSAMHL)
		Metric (mm)	US (NPT)	Outside Diameter (A)	Inside Diameter (B)	Bend Radius (C)			
SAMHL16	SSAMHL16	16	3/8"	17.8mm	12.5mm	50mm	10 / 25 / 50	10 / 25	100
SAMHL20	SSAMHL20	20	1/2"	21.1mm	15.9mm	80mm	10 / 25 / 50	10 / 25	100
SAMHL25	SSAMHL25	25	3/4"	26.4mm	21.0mm	110mm	10 / 25 / 50	10 / 25	100
SAMHL32	SSAMHL32	32	1"	33.1mm	26.7mm	144mm	10 / 25 / 50	10 / 25	100
SAMHL40	SSAMHL40	40	1 1/4"	41.8mm	35.4mm	180mm	10 / 25	10	50
SAMHL50	SSAMHL50	50	1 1/2"	47.5mm	40.4mm	240mm	10 / 25	10	50
SAMHL63	SSAMHL63	63	2"	59.7mm	51.6mm	345mm	10 / 25	10	50

Part number example SAMHL20/50M.  
Part number example SSAMHL20/100ft.  
For conduit supports use part number example SSPC20.  
NOTE: Conduit is fully cleanable and will maintain full ingress protection under normal wet cleaning conditions with associated fittings.

Raising standards of cleanliness in food and beverage

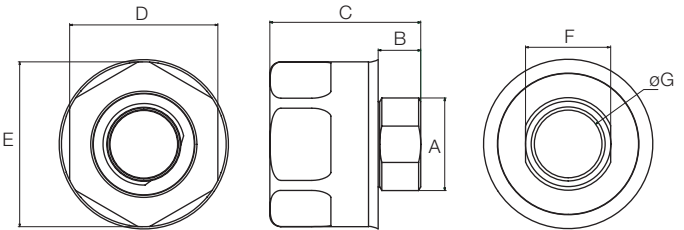
Type SAM - Single piece, Stainless Steel liquid tight fitting



Single piece, liquid tight, high temperature Stainless Steel fitting suitable for indoor splash zone areas or food processing equipment

Features

- Unique single piece design
- 316 Stainless Steel
- Face seal materials adhere to FDA (Food and Drug Administration) and European Food Contact regulations
- IP67, IP68 & IP69 protection
- Approvals CE, BS EN 61386-1,-23, NSF14159-1-2014, NSF169-2009, UL514b
- Multiple thread type Metric/NPT



Approvals


IP Rating	Appropriate Fitting
For use with: Type SAMHL & SSAMHL conduit	
IP40	Yes
IP65	Yes
IP68	Yes (10 bar 30mins)
IP69	Yes

METRIC Part no:	To fit conduit size		Nominal Dimensions						
	Metric (mm)	US (NPT)	B	C	D	E	F	G	Weight (g)
SPL16/M16/SAM	16	3/8"	7.0	32.8	30.0	31.9	14.0	10.5	9.98
SPL20/M20/SAM	20	1/2"	10.0	35.6	32.0	35.0	18.0	14.5	11.34
SPL25/M25/SAM	25	3/4"	14.0	43.0	38.0	41.0	23.0	18.3	16.78
SPL32/M32/SAM	32	1"	15.0	51.5	45.0	49.0	30.0	24.1	29.94
SPL40/M40/SAM	40	1 1/4"	16.0	53.3	57.0	61.5	38.0	32.7	39.92
SPL50/M50/SAM	50	1 1/2"	18.0	60.2	64.0	69.0	48.0	37.7	45.36
SPL63/M63/SAM	63	2"	20.0	71.4	80.0	87.0	61.0	49.0	52.16

NPT Part no:	To fit conduit size		Nominal Dimensions						
	US (NPT)	Metric (mm)	B	C	D	E	F	G	Weight (g)
SPL20/050/SAM	1/2"	20	16.0	43.2	32.0	35.0	18.0	14.5	11.34
SPL25/075/SAM	3/4"	25	16.0	46.3	38.0	41.0	23.0	18.3	16.78
SPL32/100/SAM	1"	32	21.0	57.9	45.0	49.0	30.0	24.1	29.94
SPL40/125/SAM	1 1/4"	40	21.0	60.4	57.0	61.5	38.0	32.7	39.92
SPL50/150/SAM	1 1/2"	50	21.0	64.7	64.0	69.0	48.0	37.7	45.36
SPL63/200/SAM	2"	63	21.0	74.1	80.0	87.0	61.0	49.0	52.16

Degree of Mechanical Protection
Very high corrosion resistance
Very high chemical resistance
Very high fatigue life

Material
Face seal materials adhere to FDA (Food and Drug Administration) and European Food Contact regulations
316 Stainless steel

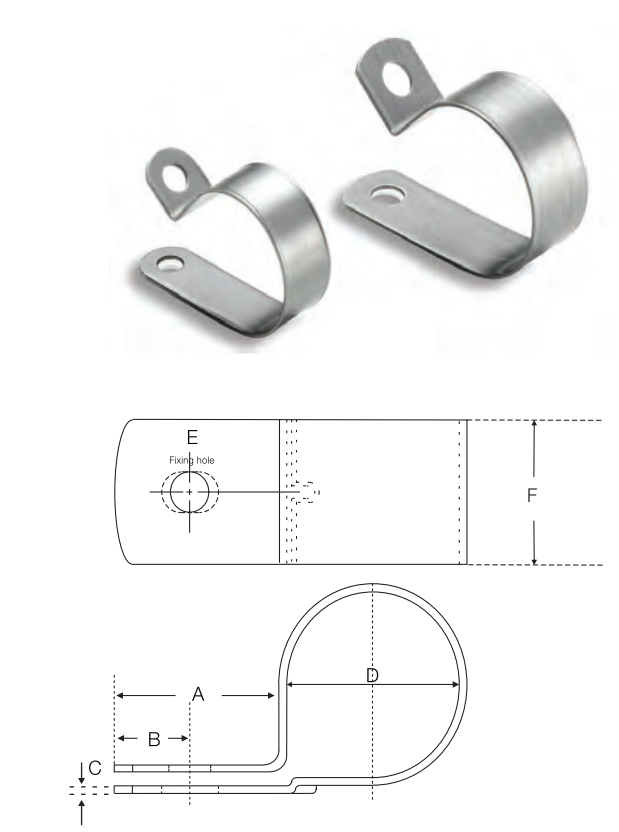
Conformity
Low voltage directive
UL514b
NSF14159-1-2014
NSF169-2009
BSI Kitemark KM35161

Temperature Range
Static Applications: -50°C to +130°C
Moving Applications: -5°C to +150°C

NOTE: Parts are maintenance free, face seal can be replaced if damaged. Parts are fully cleanable and will maintain full ingress protection under normal wet cleaning conditions.



Raising standards of cleanliness in food and beverage  
P-Clip & Locknut Stainless steel conduit P-Clip & Locknut



316 Stainless steel clip, for use with SAMHL/SSAMHL conduit. Suitable for indoor splash zone areas or food processing equipment

Part no:	Conduit Size		Dimensions (mm)					
	Metric (mm)	US (NPT)	A	B	C	D	E	F
SSPC16	16	3/8"	19.0	9.0	0.7	16	6.0	12.7
SSPC20	20	1/2"	19.0	9.0	0.7	20	6.0	12.7
SSPC25	25	3/4"	19.0	9.0	0.7	25	6.0	12.7
SSPC32	32	1"	19.0	9.0	0.7	32	6.0	12.7
SSPC40	40	1 1/4"	19.0	9.0	0.9	40	6.0	12.7
SSPC50	50	1 1/2"	19.0	9.0	0.9	50	6.0	12.7
SSPC63	63	2"	19.0	9.0	0.9	63	6.0	12.7

Temperature Range

Static Applications:  
-50°C to +130°C

Moving Applications:  
-5°C to +150°C

Degree of Mechanical Protection

Very high corrosion resistance

Very high chemical resistance

Very high flexibility

Very high fatigue life



316 Stainless steel, suitable for indoor splash zone areas or food processing equipment

Part no:	Conduit Size
	Metric
LNSS16	M16
LNSS20	M20
LNSS25	M25
LNSS32	M32
LNSS40	M40
LNSS50	M50
LNSS63	M63

Part no:	Conduit Size
	US (NPT)
LNSS038	3/8"
LNSS050	1/2"
LNSS075	3/4"
LNSS100	1"
LNSS125	1 1/4"
LNSS150	1 1/2"
LNSS200	2"

Temperature Range

Static Applications:  
-50°C to +130°C

Moving Applications:  
-5°C to +150°C

Degree of Mechanical Protection

Very high corrosion resistance

Very high chemical resistance

Very high fatigue life





# Raising standards of cleanliness in food & beverage

## An innovative partnership with BioCote



### Discussing ABB’s partnership with global anti-microbial solution provider BioCote.

In 2008 the global food and beverage sector was valued at \$5.7trillion, rising to nearly \$7trillion in 2014, making it the world’s largest industrial sector. However, poor cable protection choices by manufacturers contributes to the collective cost of millions linked to bacterial contamination and the knock-on effects of downtime.

Faced with stringent health and safety standards within challenging environments – from sub-zero to elevated temperatures – processors in the food and beverage industry fight a constant battle to ensure equipment operates efficiently, safely, and hygienically, without compromising valuable power and data connections.

However, cable protection systems like conduits and fittings, can in themselves become a home for bacteria and pose a direct threat to food manufacturing. It is well known and proven that bacteria can adapt and survive on the various

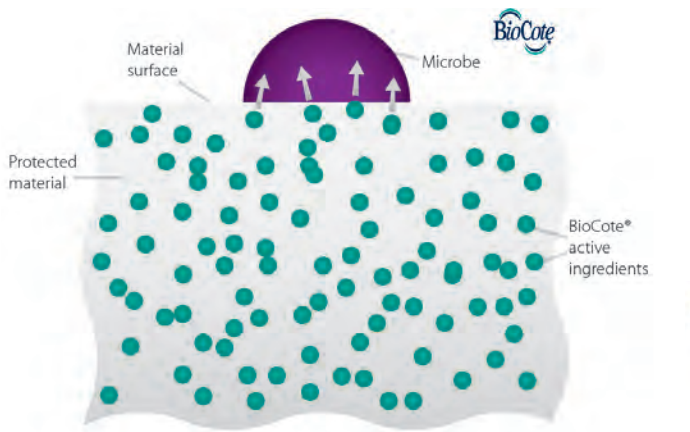
surfaces, meaning a structured and thorough cleaning regime is a must for clean equipment and food safety.

Regular cleaning is required, since it only temporarily reduces the threat of infection. However this increases the likelihood of liquid ingress and material corrosion. With a wash-down, the killing of bacteria is instant, but stops once stimulus (high pressure wash and chemicals) is removed and the equipment dries. This causes an obvious tension between the need for a dry environment to prevent water ingress, whilst, in turn, doing what’s needed to hamper bacterial growth.

To tackle this problem ABB has formed a commercial partnership with anti-microbial protection experts, BioCote, to introduce a cable protection solution that can withstand the challenging environment of the food and beverage industry, and is proven to eradicate up to 99.9% of contaminating bacteria. The new liquid tight conduit from ABB for Adaptaflex,

features a smooth FDA, EC and FSA compliant DuPont Hytrel® thermoplastic jacket, with integral anti-microbial protection incorporating an ionic silver additive. An industry first, single piece liquid tight 316 Stainless Steel fitting completes the system.

Based on a silver glass powder matrix, the anti-microbial additive provides a slow release of silver ions to the surface of the product protecting against bacterial contamination and the growth of mold, whilst providing highly chemical resistant properties.



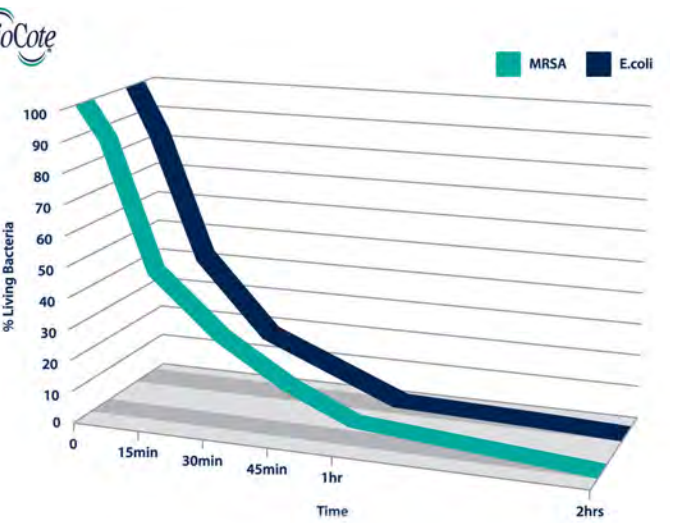
The liquid tight nature of the system - up to IP69 – and anti-microbial protection, combine to protect power and data cables within, from extreme temperatures and the subsequent wear from regular daily wash downs. Crucially, the integral anti-microbial protection, which neither wears off or washes away, attacks both gram negative and gram positive bacteria, such as MRSA and E.coli, with testing showing reductions in bacteria within 15 minutes compared to an untreated surface.

“The biocidal coating attacks bacteria that comes into contact with it, eliminating upto 99% of bacteria in a couple of hours...”

Guy Charteris, Partner Development Manager at BioCote Ltd comments: “Given the volume of mechanical process equipment involved in the food and beverage industry, such as pumps and motors, combined with the shift towards increased automation, there are often thousands of power and data cables that need to be protected. The ever present and biggest threat to a food and beverage manufacturer is bacteria. Health and safety and infection controls, mean daily equipment wash downs often using chemicals and at high temperatures, are common place.

‘...the integral anti-microbial protection, which neither wears off or washes away, attacks both gram negative and gram positive bacteria, such as MRSA and E.coli.’

“As we have seen in recent years, it can take just a single bacterial infection to eradicate decades of consumer trust, crippling a company’s finances in the process. Though anti-microbial technology should not be viewed as a replacement to cleaning, the addition of anti-microbial additives, enhances the system integrity proven by our repeated testing and observations showing bacterial reductions of up to 80% in just 15 mins on the treated conduit systems compared to untreated systems, rising to a 99% bacteria reduction in two hours.”



Meirion Buck, Senior Design & Technical Manager at ABB for Adaptaflex comments: “As liquid tight conduit systems are used across all food and beverage manufacturing sites, we have developed the new system with BioCote, to help give manufacturers piece of mind when it comes to infection protection. The biocidal coating attacks bacteria that comes into contact with it, eliminating up to 99% of bacteria in just a couple of hours, reducing the potential risk of contamination, ultimately reducing the amount of downtime and material cost spent on maintaining cable protection systems. Given the size of the global food and beverage market, the new range can offer end users a quantifiable return on investment and help eliminate the risk of bacterial contamination.”



# Contact us

## ABB

Tower Court,  
Courtaulds Way,  
Coventry, CV6 5NX  
UK Sales Support tel: +44 (0) 2476 368500  
Customer services: [lv.customerservice@gb.abb.com](mailto:lv.customerservice@gb.abb.com)  
Technical Support e-mail: [cmg.conduitsystems@tnb.com](mailto:cmg.conduitsystems@tnb.com)

[www.adaptaflex.com](http://www.adaptaflex.com)

**Note:** We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.

Copyright © 2017 ABB  
All rights reserved