Food contact push-in fittings

Series FCM

The “Food Contact Material” push-in fittings series are produced in Italy according to the reference ISO norms as warranty of high quality level.

Ordering code

F 01 4 M5

SERIES
F = Food contact push-in fittings FCM

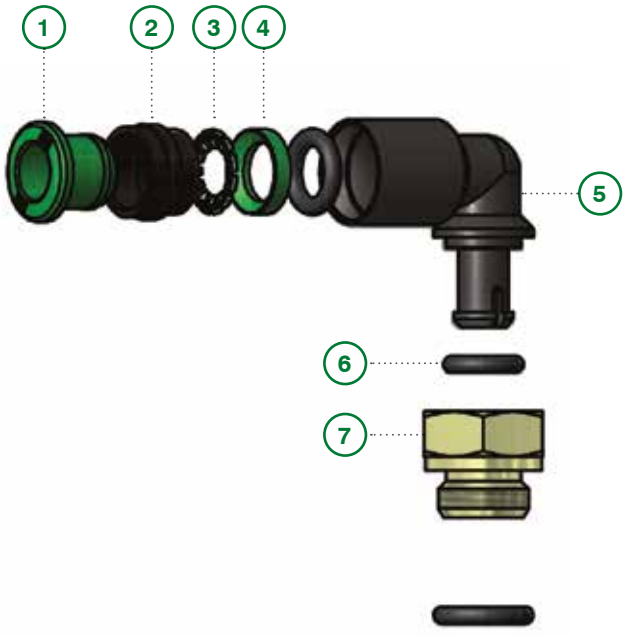
MODEL TYPE
01 = Straight male adaptor (parallel)
01T = Technopolymer straight male adaptor (parallel)
02 = Straight female adaptor
03 = Straight connector
04 = Elbow connector
04L0 = Plug-in elbow connector
05 = T connector
06 = Adaptor parallel (short)
08 = Plug-in reducer
20 = Swivel male stud T parallel
22 = Swivel T technopolymer male adaptor
22T = Swivel T technopolymer male adaptor
23 = Y connector

TUBE CONNECTION
4 ... 10 = Tube diameter

THREADED CONNECTION
M5 = M5 x 0,8
18 = G1/8
14 = G1/4

THRUST SLEEVE COLOUR
Blank = Green

See assembly instructions in the appendix on page 211



Components

1 Thrust sleeve
2 Lock ring
3 Crimping gripper
4 Supporting ring
5 Fitting body
6 O-Ring seal
7 Swiwel base

A new mission

In a demanding sector such as "Food & Beverage", in order to satisfy customers' requests, products must ensure high reliability and compliance with relevant international standards.
In this perspective born the new series of Fcm (Food Contact Material) fittings, suitable for food contact, and drinkable liquid passage, according to the European regulations 1935/2004, 2023/2006, 11/2011 and for contact with drinking according to the Ministerial Decree 174/2004.
The FCM series also complies with NSF/169 regulations for the US market.

The FCM series, manufactured by Titan Engineering Spa, is part of a route based on the conviction that it is increasingly necessary to direct business strategies towards sustainable development, paying the greatest attention to people's health and respect for the environment; these are fundamental beliefs for which the company already acquired the ISO14001 and ISO45001 certifications, which are integrated into the quality management system ISO9001.

Introduction

Titan Engineering Spa, motivated by the target to innovate and progress and following its studies and research in the field of "food contact", has committed itself to designing and implementing, in a path of synergic growth with the main partners, both customers and suppliers, a test machine capable of satisfying the requests for compatibility and use of its products in the food sector, with the possibility of using the most varied liquids.

Purpose of the machine and tests

With these assumptions the machine named: "**APC060519TE**" was born, a real test tool developed in collaboration with expert and specialized longtime companies in the "food contact" field, thanks to whose application experience all necessary peculiarities in compliance with the expected regulatory requirements have been ensured, just think that the machine, in all its parts, was built using only components suitable for contact with food and drinking liquids.

The tests that can be performed have the purpose of validating the suitability of the new FCM fittings series made by Titan Engineering Spa, **so not only on contact, but also on the passage of a specific food fluid.** Furthermore, the general test parameters (pressure, duration, type of fluid, etc.) may change according to the end customer's request and to the type of application, with the aim of offering a response as close as possible to the real use conditions.

Test result and reports

The results obtained from the carried out tests, supported by proper photographic documentation, will be used, where required and thanks to appropriate forms, to accompany the supply, constituting adequate certification of suitability.

With this in mind, Titan Engineering Spa, in a preventive way, is also carrying out a program of tests concerning the f luids among those most used in the food applications, such as: drinking water, wine, beer and carbonated drinks in general, in order to create a documentary base to be made available to customers, leaving them the chance to request targeted tests, even personalized ones, just when their application needs should require it (in this regard, a special access form, which must contain all specifications necessary in order to correctly proceed to the validation tests, has been prepared).

General technical characteristics

Dimensions: 74 x 130 x 100.5 cm

Weight: 160 kg

Testable pressure range: 0-16 Bar

Testable piping sizes: Ø4-Ø14

Types of testable fluids: Drinking water and any fluid for food use at the customer's request

Test temperature: environment

Pump type: NFS 169 food approved

Pump capacity: 100 L/H

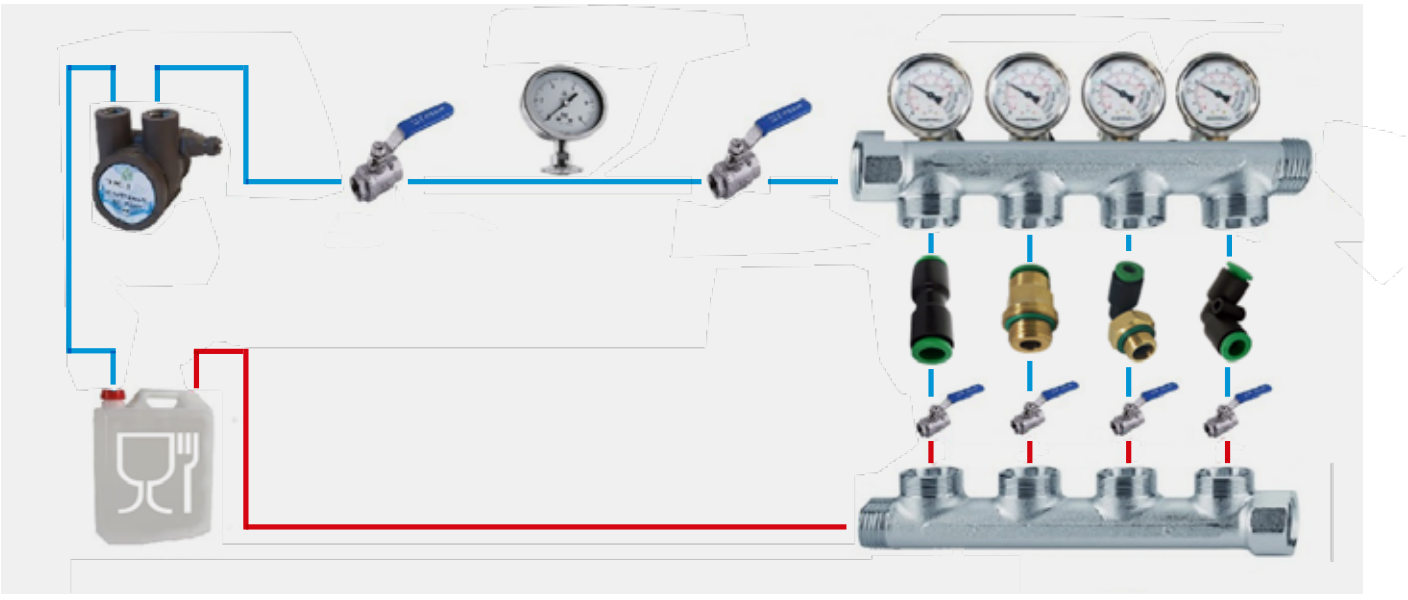
Plant technical description: Pipes, fittings, machine, entirely in AISI 316L stainless steel, approved for use with drinking water and food contact

Machine certifications

Machine compliant with CE standards 2014/35 / UE
Tests compliant with UNI EN ISO 13846: 2001 and above
Available documentation:

- CE declaration of conformity
- Use and maintenance manual
- PED non-applicability analysis
- Analysis and machine risks sheet

Functional tests performed with machine APC060519TE



TEST CONDITION	Pressure	Constant 8 bar
	Circuit	Closed
	Temperature	Environment 22°C-30°C
	Duration	2400 h continuously

		Type of fluid			
		Drinking water	Wine	Beer	Sparkling soft drink
TEST RESULTS	Liquid leakage	NO	NO	NO	NO
	Presure loss	NO	NO	NO	NO
	Outcome	✓	✓	✓	✓

Migration test

The global and specific migration tests shown in the table are used to determine the quantities migrated and the subsequent control of re-entry within the limits imposed by the regulations, are carried out to check the migration phenomena of materials in contact with food.

TYPE OF TEST PERFORMED	COMPONENTS	TEST RESULT
Global migration, specific migration of dyes, specific migration of metals. Simulants: A, B, D2 +primary aromatic mmine migration test simulant B.	Thrus sleeve	✓
	Fitting body (POM)	✓
	Fitting body and swivel base (Ixef1022 FC)	✓
Global migration + Citric acid simulant	Fitting body and swivel base (CW510L-OT57)	✓
Specific migration test Cr, Ni, Mn simulant B	Crimping Gripper	✓
Global migration test simulant rubber A +specific migration test simulant B	O-ring seal	✓

The specific migration limits are respected in the conditions of use mentioned above.

A: Ethanol 10%
B: Acetic acid..... 3%
C: Ethanol 20%
D1: Ethanol 50%
D2: Vegetable oil
E: Poly (2,6-diphenyl-p-phenylene oxide)

Technical sheet

FLUIDS		Compressed air and main food fluids
APPLICATIONS		Compressed air applied to machines intended for the food and beverage field (boxing, bagging machines, vacuum packaging, oenology, etc.) and machines for the passage of low temperature drinkable fluids (filling, bottling, tapping, etc.)
SUGGESTED TUBES		TPU, PA11/PA12, TPE, TCO for compressed air. PE, PVC, PELD for food fluids.
TUBES TOLERANCES		Diam. between 4 and 10 mm +/- 0,05
TEMPERATURE AND PRESSURE	Recommended limit values	Temperatures and pressures usually depend by the technical features of the employed tubes, anyway it is suggested a limit working pressure of 15 bar and a temperature range between -20°C and +70°C.
	Technical testing data	In the table below there are indicated the load traction resistance values and the main working and breaking limit (Pressure and Temperature) of the main commercial tubing.
	Note	For more complete informations please read the technical catalogue of your tube supplier.
THREAD TYPE		BSP parallel UNI-ISO 228; Metric ISO/R 262
MATERIALS	Body and swivel bases	Brass UNI EN CW510L
	Sleeve, collar and back ring	POM copolymer ISO1043-1 (REG. UE 10/2011)
	Spring	Stainless steel AISI 301 austenitic
	Seals	NBR 70 DIN-ISO 1629 (DM 21:1973, FDA 177.2600)

Additional technical informations

Each FCM production batch is tested according to severe cyclics “lot breaker” controls along all the production period, which include shape observation, leakage verification, functionality, at the working pressure of 8 bar. Then all samples taken from the lot are tested by a traction machine which simulate a breaking pressure of 50 bar. Here below are indicated the traction loads (in Newton) for each size:

TUBE DIAMETER	Ø4	Ø6	Ø8	Ø10
BREAKING LOAD	63 N	141 N	251 N	393 N

Important note: The values refer to the resistance of the crimping gripper, “core part” of both fittings, the brass and the technopolymer FCM. The breaking experimental values measured, according to the diameter, were from 1.2 to 2.5 times higher.

Additional information regarding the working temperatures:

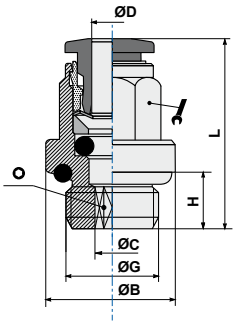
Further to all the necessary assessments on the use of the fittings in operating conditions different from how suggested in the initial technical sheet must be considered, with reference to temperatures, the nominal data regarding the type of the used tube and the limit imposed by the most critical component.
SERIES FCM: **-20° +70°**

WORKING PRESSURE AND BREAKING PRESSURE (BAR) AT DIFFERENT TEMPERATURES						
Example	T-20°C		T+23°C		T+60°C	
Tube 6x4 colored	working P bar	breaking P bar	working P bar	breaking P bar	working P bar	breaking P bar
TPU	18,7	74,8	10,0	40,0	5,2	20,8
PA11	37,4	149,6	20,0	80,0	10,4	41,6
PA12	48,6	168,3	26,0	90,0	10,4	36,0
PE	18,7	74,8	10,0	40,0	5,0	20,0

ART. F01

Straight male adaptor (parallel)

COD.	ØD	G	ØC	ØB	H	L		O		g
F0104M5	4	M5	2,6	9	4	20,5	*	2,5	10	4,07
F010418	4	1/8	2,6	13,5	5,5	20	9	2,5	5	7,42
F010414	4	1/4	2,6	17	6,5	21	9	2,5	5	11,02
F0106M5	6	M5	2,6	11	4	22,8	*	2,5	5	6,70
F010618	6	1/8	4,2	13,5	5,5	25,3	11	4	5	10,16
F010614	6	1/4	4,2	17	6,5	24,3	11	4	5	13,64
F010818	8	1/8	5,2	12,8	5,5	27	13	5	5	11,33
F010814	8	1/4	6,2	17	6,5	25,5	13	6	5	12,54
F011014	10	1/4	7,3	16	6,5	30,4	16	7	5	18,15

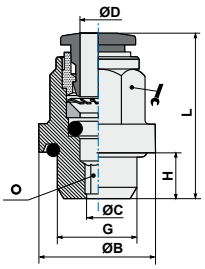


* codes without key flats having the following Ø:
F0104M5 = Ø9
F0106M5 = Ø11

ART. F01T

Straight male adaptor (parallel)

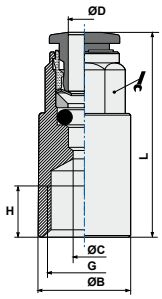
COD.	ØD	G	ØC	ØB	H	L		O		g
F01T0418	4	1/8	2,5	14,0	5,5	19,0	10	2,5	5	2,16
F01T0414	4	1/4	2,5	17,5	6,5	20,8	10	2,5	5	3,36
F01T0618	6	1/8	4,0	14,0	5,5	24,5	12	4,0	5	3,10
F01T0614	6	1/4	4,0	17,5	6,5	26,0	12	4,0	5	4,26
F01T0818	8	1/8	5,0	14,0	5,5	25,7	14	5,0	5	3,53
F01T0814	8	1/4	6,0	17,5	6,5	27,2	14	6,0	5	4,58
F01T1014	10	1/4	7,0	17,5	6,5	28,7	18	7,0	5	6,33



ART. F02

Straight female adaptor

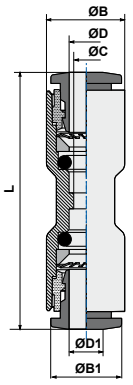
COD.	ØD	G	ØC	ØB	H	L			g
F020418	4	1/8	3	12	6,5	26,5	9	5	10,73
F020618	6	1/8	5	12	6,5	28,3	11	5	11,03
F020614	6	1/4	5	17	10	31,3	11	5	16,80
F020818	8	1/8	7	12	6,5	28,5	13	5	10,89
F020814	8	1/4	7	17	10	32,5	13	5	19,15



ART. F03

Straight connector

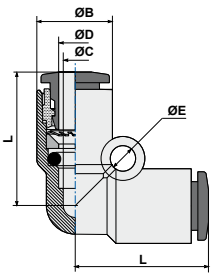
COD.	ØD	ØD1	ØC	ØB	ØB1	L		g
F030400	4	4	3	9,5	9,5	32,0	5	1,96
F030406	4	6	3	9,5	11,5	32,5	5	2,40
F030600	6	6	5	11,5	11,5	35,6	5	3,00
F030608	6	8	5	11,5	13,5	36,0	5	3,27
F030800	8	8	7	13,5	13,5	38,0	5	3,53
F030810	8	10	7	13,5	17,0	32,5	5	5,03
F031000	10	10	9	17,0	17,0	42,3	5	6,04



ART. F04

Elbow connector

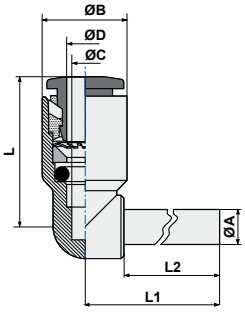
COD.	ØD	ØC	ØB	L	ØE		g
F040400	4	3	9,5	17,2	3,2	5	2,21
F040600	6	5	11,5	20,8	3,2	5	3,28
F040800	8	7	13,5	23,0	3,2	5	4,14
F041000	10	9	17,0	26,4	4,3	5	7,21



ART. F04L0

Plug-in elbow connector

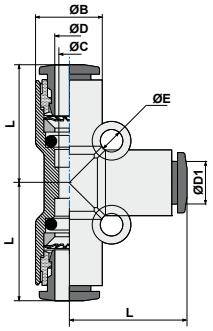
COD.	ØD	ØC	ØB	L	L1	ØA	L2		g
F0404L0	4	3	9,5	17,2	20,75	4	16,7	5	1,40
F0406L0	6	5	11,5	20,8	24,25	6	19,5	5	2,18
F0408L0	8	7	13,5	23,0	27,25	8	21,0	5	2,96
F0410L0	10	9	17,0	26,4	31,80	10	24,0	5	5,07



ART. F05

T connector

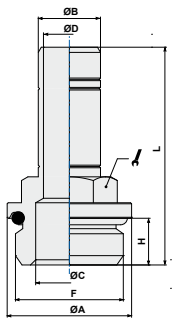
COD.	ØD	ØD1	ØC	ØB	L	ØE		g
F050400	4	4	3,0	9,5	17,2	3,2	5	3,16
F050600	6	6	5,0	11,5	20,8	3,2	5	4,72
F050800	8	8	7,0	13,5	23,0	3,2	5	5,96
F051000	10	10	9,0	17,0	26,4	4,3	5	10,69



ART. F06

Adaptor parallel (short)

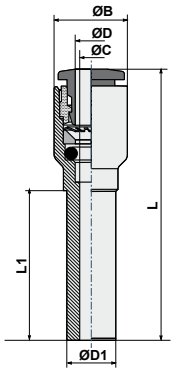
COD.	ØB	F	ØA	ØC	ØD	H	L			g
F060418	4	1/8	13	5,5	2	5,5	27,7	13	5	9,10
F060618	6	1/8	13	5,5	4	5,5	30,5	13	5	9,61
F060614	6	1/4	16	7,5	4	6,5	32,0	13	5	11,97
F060818	8	1/8	13	6	6	5,5	32,0	13	5	11,05
F060814	8	1/4	16	7,5	6	6,5	33,5	13	5	13,12
F061014	10	1/4	16	8	8	6,5	36,5	13	5	14,06



ART. F08

Reducer

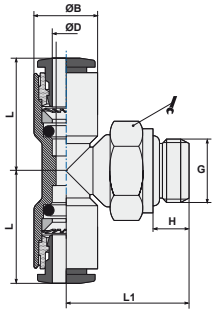
COD.	ØD1	ØD	ØC	ØB	L	L1		g
F080604	6	4	3	9,5	35,5	19,5	5	1,37
F080804	8	4	3	9,5	37,0	21,0	5	1,60
F081004	10	4	3	9,5	40,0	24,0	5	1,97
F081204	12	4	3	9,5	41,0	25,0	5	2,22
F080806	8	6	5	11,5	39,05	23,0	5	2,10
F081006	10	6	5	11,5	42,05	24,0	5	2,49
F081206	12	6	5	11,5	43,05	25,0	5	2,80
F081008	10	8	7	13,5	43,0	26,25	5	2,74
F081208	12	8	7	13,5	44,0	25,0	5	3,00
F081210	12	10	9	17,0	46,15	27,55	5	4,40



ART. F20

Swivel male stud T parallel

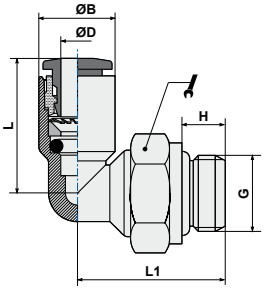
COD.	ØD	G	ØB	H	L	L1			g
F200418	4	1/8	9,5	5,5	17,2	18,5	13	5	8,56
F200618	6	1/8	11,5	5,5	20,8	18,5	13	5	9,48
F200614	6	1/4	11,5	7,5	20,8	20,4	16	5	14,94
F200818	8	1/8	13,5	5,5	23,0	20,0	13	5	10,64
F200814	8	1/4	13,5	6,5	23,0	20,4	16	5	14,30
F201014	10	1/4	17,0	7,5	26,4	23,2	16	5	42,30



ART. F22

Swivel elbow technopolymer male adaptor

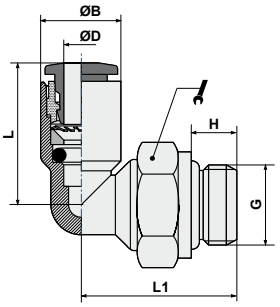
COD.	ØD	G	ØB	H	L	L1			g
F2204M5	4	M5	9,5	4	17,2	17	8	10	3,79
F220418	4	1/8	9,5	5,5	17,2	18,5	14	10	7,80
F220414	4	1/4	9,5	6,5	17,2	20,4	16	10	13,12
F2206M5	6	M5	11,5	4	20,8	17	8	10	4,31
F220618	6	1/8	11,5	5,5	20,8	18,5	14	10	8,11
F220614	6	1/4	11,5	6,5	20,8	20,4	16	10	13,82
F220818	8	1/8	13,5	5,5	23,0	20,0	14	10	8,93
F220814	8	1/4	13,5	6,5	23,0	20,4	16	5	12,39
F221014	10	1/4	17,0	6,5	26,4	23,2	16	5	14,40



ART. F22T

Swivel elbow technopolymer male adaptor

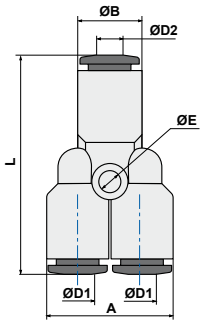
COD.	ØD	G	ØB	H	L	L1			g
F22T0418	4	1/8	9,5	5,5	17,2	18,5	14	10	7,76
F22T0414	4	1/4	9.5	6,5	17,2	20,4	16	10	13,11
F22T0618	6	1/8	11,5	5,5	20,8	18,5	14	10	8,10
F22T0614	6	1/4	11,5	6,5	20,8	20,4	16	10	13,81
F22T0818	8	1/8	13,5	5,5	23,0	20,0	14	10	8,92
F22T0814	8	1/4	13,5	6,5	23,0	20,4	16	10	12,99
F22T1014	10	1/4	17,0	6,5	26,4	23,2	16	10	14,40



ART. F23

Y connector

COD.	ØD1	ØD2	ØE	ØB	A	L		g
F230400	4	4	2,40	9,5	19	33,0	5	2,98
F230406	4	6	2,40	11,5	19	35,8	5	3,56
F230600	6	6	2,60	11,5	23	38,6	5	4,83
F230608	6	8	3,20	13,5	23	39,8	5	5,26
F230800	8	8	2,75	16,5	27	42,5	5	6,29
F230810	8	10	3,20	17,0	27	44,4	5	7,84
F231000	10	10	4,30	20,0	34	50,8	5	11,16



ART. PELD

Polyethilene tube for food applications (low density)

COD.	Dxd mm	P* bar	P1* bar	R* mm	
PE0402	4x2	18,5	75	20	100
PE0425	4x2,5	15	60	25	100
PE0604	6x4	10	40	40	100
PE0806	8x6	7,5	30	50	100
PE1008	10x8	6	25	120	100

P*= Working pressure (Bar) 23°C
P1*= Breaking pressure (Bar) 23°C
R*= Tight bending radius (mm) 23°C