

Friction Cups For Oily Surfaces

BONDY

INDUSTRIAL EQUIPMENT SUPPLIER

For ordering and questions call

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DURAFLEX® FRICTION CUPS

New improved models DCF for domed surfaces and BFFT for very thin metal sheets



Our Mission

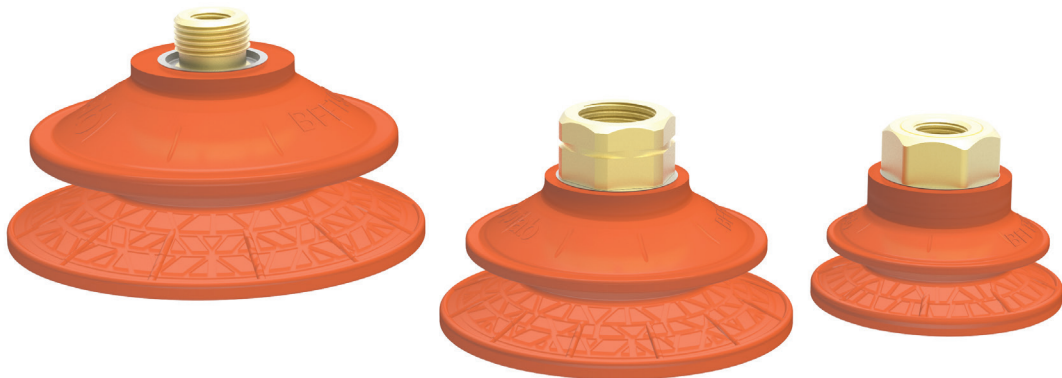
The Piab mission is to increase productivity for industrial customers and provide energy saving solutions by promoting our superior technology universally.



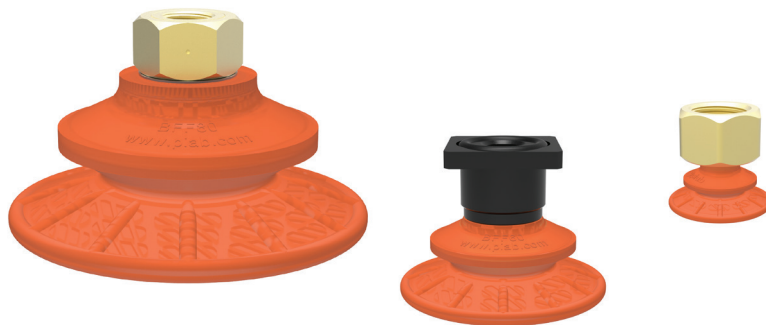
Selection of DCF



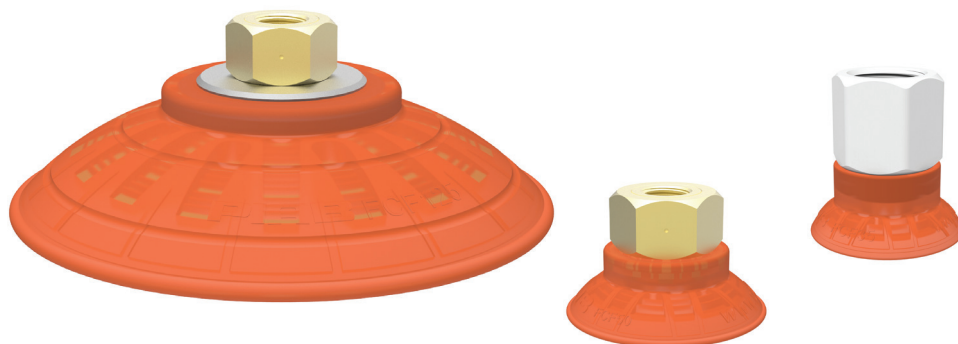
Selection of BFFT



Selection of new BFF



Selection of new FCF



Features and benefits

- **Handling parts with an oily or slippery metal surface.** The DURAFLEX® Friction Cups are tailor-made for handling parts with an oily or slippery metal surface.
- **Higher machine speed without risk for sliding cups, resulting in downtime and scrap.** The new friction cups the DCF and BFFT have a special pattern that resembles the ones found on winter/snow tires that will give even additional shear force grip.
- **Easy to retrofit.** The new cups match industry standard of cup build heights.
- **Minimize micro leakage.** Thanks to the lip's sealing area being larger/wider compared to other similar cups, it will minimize the risk or micro leakage due to particles on the metal sheet.
- **No dents on thin sheets.** The BFFT is especially designed for thin metal sheets and the cups have been tested to avoid giving dents.
- **Great grip performance on flat and quite concave or convex surfaces.** To achieve a best-in-class grip, the design of DCF cups are thin and pliable, that in combination with a special inner friction pattern will maximize grip performance. On DCF cups, we are not using an inner friction hub, the entire inner section of the cup works as a friction area.
- **Higher machine speed without risk for sliding cups, resulting in downtime and scrap.** The DURAFLEX® Friction Cups are tailor-made for handling parts with an oily or slippery metal surface.
- **Higher productivity.** These cups have exceptional elastic memory which will result in longer between service intervals and less mispicks resulting in down time and scrap due to misshaped cups.
- **Lower cost of ownership.** The products have a much better oil and abrasion resistance than Nitrile cups that will provide an outstanding life time of the cups.

Bellows flat friction family (BFF)



- Special designed friction cups for oily surfaces, such as sheets in metal forming processes.
- Normal wear on friction cup will not affect the long term shear force performance.
- Best choice if $> 0.1\text{g/m}^2$ press oil is used on the sheet.
- Thanks to the strong grip on oily surfaces, the suction cups can withstand high shear forces, typically 2–4 times more than corresponding conventional suction cups.
- The “BFF” design is suitable for uneven/curved surfaces or if level compensation is needed, for example in de-stacking applications.
- The flat inner support gives stability during movement in any orientation.
- DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

Lifting forces

Name	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level	
	60 -kPa	90 -kPa	60 -kPa	90 -kPa
BFF30P	24/23*	27/30*	11/5.5*	13.5/7.8*
BFF40P	43/45*	56/60*	60/35*	81/45*
BFF60P	77/82*	112/106*	90/76*	122/93*
BFF80P	176/174*	236/207*	201/110*	240/160*
BFF110P	279/284*	377/345*	298/235*	346/253*

* Dry metal sheet/Oily metal sheet.

General specifications

Name	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm ³
BFF30P	30	30	15	5	5
BFF40P	45	32–51.5*	23	7	10
BFF60P	61	36–55.3*	35	10	20
BFF80P	85	46–55.8*	50	14	50
BFF110P	115	53–72.5*	95	21	110

* Height range includes fittings.

Available materials

Name	PU55°/PU60°
BFF30P	●
BFF40P	●
BFF60P	●
BFF80P	●
BFF110P	●

Applications

Table shows typical applications for the suction cup. For more detailed information, please visit piab.com.

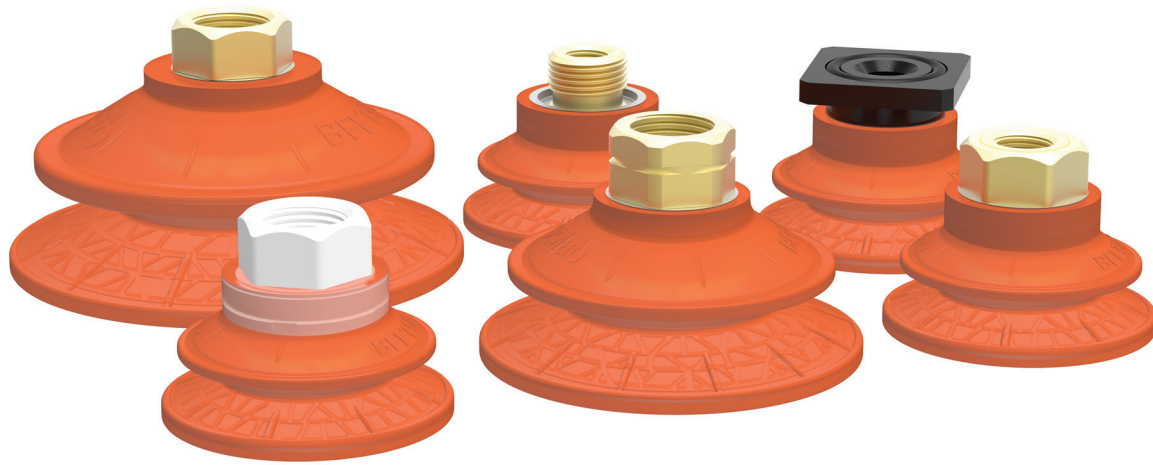
Name	Oily sheet metal
BFF30P	●
BFF40P	●
BFF60P	●
BFF80P	●
BFF110P	●

Ordering information

Name	Art. no.	
Suction cup BFF30P Polyurethane 55/60, 3/8" NPT female	0206915	New!
Suction cup BFF30P Polyurethane 55/60, G1/4" female	0206918	New!
Suction cup BFF30P Polyurethane 55/60, G3/8" female	0206908	New!
Suction cup BFF30P Polyurethane 55/60, G3/8" female plastic	0206599	New!
Suction cup BFF30P Polyurethane 55/60, G3/8" male, 1/8" NPSF female	0201821	
Suction cup BFF30P Polyurethane 55/60, T-slot	0206924	New!
Suction cup BFF40P Polyurethane 55/60, 3/8" NPT female	0122278	
Suction cup BFF40P Polyurethane 55/60, G1/4" female	0206940	New!
Suction cup BFF40P Polyurethane 55/60, G3/8" female	0118992	
Suction cup BFF40P Polyurethane 55/60, G3/8" female, 17 mm thread	0200697	
Suction cup BFF40P Polyurethane 55/60, G3/8" male, with mesh filter	0118991	
Suction cup BFF40P Polyurethane 55/60, M10x1.5 male	0121427	
Suction cup BFF40P Polyurethane 55/60, T-slot, with mesh filter	0206925	New!
Suction cup BFF60P Polyurethane 55/60, 3/8" NPT female	0122279	
Suction cup BFF60P Polyurethane 55/60, G1/4" female	0206941	New!
Suction cup BFF60P Polyurethane 55/60, G3/8" female	0118995	
Suction cup BFF60P Polyurethane 55/60, G3/8" female, 17 mm thread	0200699	
Suction cup BFF60P Polyurethane 55/60, G3/8" female, plastic thread	0124742	
Suction cup BFF60P Polyurethane 55/60, G3/8" male, with mesh filter	0118994	
Suction cup BFF60P Polyurethane 55/60, M10x1.5 male	0121428	
Suction cup BFF60P Polyurethane 55/60, T-slot, with mesh filter	0206933	New!
Suction cup BFF80P Polyurethane 55/60, 3/8" NPT female	0122280	
Suction cup BFF80P Polyurethane 55/60, G1/4" female	0206942	New!
Suction cup BFF80P Polyurethane 55/60, G3/8" female	0118670	
Suction cup BFF80P Polyurethane 55/60, G3/8" female, 17 mm thread	0200695	

Name	Art. no.	
Suction cup BFF80P Polyurethane 55/60, G3/8" female, plastic thread	0124717	
Suction cup BFF80P Polyurethane 55/60, G3/8" male, with mesh filter	0118997	
Suction cup BFF80P Polyurethane 55/60, M10x1.5 male	0121384	
Suction cup BFF80P Polyurethane 55/60, T-slot, with mesh filter	0206934	New!
Suction cup BFF110P Polyurethane 55/60, 3/8" NPT female	0122281	
Suction cup BFF110P Polyurethane 55/60, G1/4" female	0206943	New!
Suction cup BFF110P Polyurethane 55/60, G3/8" female	0118673	
Suction cup BFF110P Polyurethane 55/60, G3/8" female, 17 mm thread	0200696	
Suction cup BFF110P Polyurethane 55/60, G3/8" female, plastic thread	0124734	
Suction cup BFF110P Polyurethane 55/60, G3/8" male, with mesh filter	0118671	
Suction cup BFF110P Polyurethane 55/60, M10x1.5 male	0121430	
Suction cup BFF110P Polyurethane 55/60, T-slot, with mesh filter	0206935	New!

Bellows flat friction, Thin sheets family (BFFT)



- Special designed friction cups for thin (0.6–0.8 mm) oily metal sheets, such as outer body car parts in a press-to press forming process.
- Long lasting material, normal wear on friction cup will not affect the long term grip performance.
- Refined internal friction pattern provides additional grip performance, the suction cups can withstand high shear forces, typically 3–5 times more than corresponding conventional suction cups.
- Best choice if $> 0.1\text{g/m}^2$ press oil is used on the sheet but also a great choice for dry metal sheets.
- The “BFFT” design is suitable for thin flat or uneven/curved surfaces and if level compensation is needed, for example in de-stacking applications.
- The flat inner support, made of dual hardness, gives stability and good grip during movement in any orientation.
- DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled and has a fantastic elastic memory, even after hundreds of thousands of cycles.

Lifting forces

Name	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level	
	60 -kPa	90 -kPa	60 -kPa	90 -kPa
BFFT50P	105/104*	146/145*	122/61*	155/85*
BFFT70P	172/165*	220/211*	176/110*	245/148*
BFFT90P	184/184*	228/230*	273/171*	364/232*

* Dry metal sheet/Oily metal sheet.

General specifications

Name	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm ³
BFFT50P	53	36.6	85	11	14.8
BFFT70P	73	41.1	95	14	36.4
BFFT90P	93	50.4	130	21	83.6

Available materials

Name	PU60°/PU60°/PU30°
BFFT50P	●
BFFT70P	●
BFFT90P	●

Applications

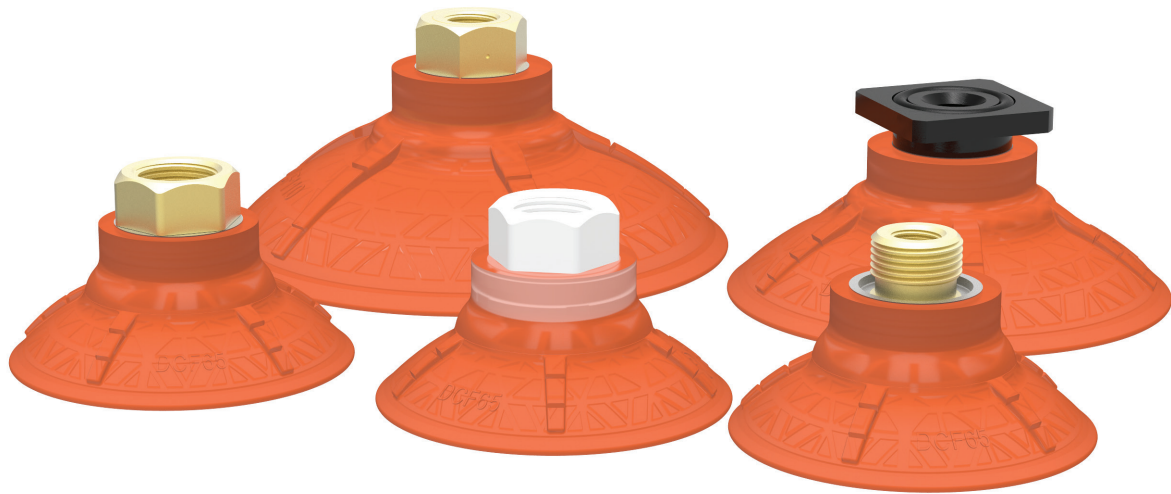
Table shows typical applications for the suction cup. For more detailed information, please visit piab.com.

Name	Oily sheet metal
BFFT50P	●
BFFT70P	●
BFFT90P	●

Ordering information

Name	Art. no.
Suction cup BFFT50P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206519
Suction cup BFFT50P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206521
Suction cup BFFT50P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206522
Suction cup BFFT50P Polyurethane 60/60/30, G3/8" female plastic	0206523
Suction cup BFFT50P Polyurethane 60/60/30, T-slot, with mesh filter	0206524
Suction cup BFFT50P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206791
Suction cup BFFT70P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206525
Suction cup BFFT70P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206526
Suction cup BFFT70P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206527
Suction cup BFFT70P Polyurethane 60/60/30, G3/8" female plastic	0206528
Suction cup BFFT70P Polyurethane 60/60/30, T-slot, with mesh filter	0206529
Suction cup BFFT70P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206792
Suction cup BFFT90P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206530
Suction cup BFFT90P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206531
Suction cup BFFT90P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206532
Suction cup BFFT90P Polyurethane 60/60/30, G3/8" female plastic	0206533
Suction cup BFFT90P Polyurethane 60/60/30, T-slot, with mesh filter	0206534
Suction cup BFFT90P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206793

Deep concave friction family (DCF)



- Special designed friction cups for domed or flat oily surfaces, such as sheets in metal forming processes.
- Long lasting material, normal wear on friction cup will not affect the long term shear force performance.
- Best choice if $> 0.1\text{g/m}^2$ press oil is used on the sheet but also a great choice for dry metal sheets.
- Refined internal friction pattern provides additional grip performance, the suction cups can withstand high shear forces, typically 3–5 times more than corresponding conventional suction cups.
- Thin design that easily will follow convex or concave surfaces. The thin and pliable design in combination with a special inner friction pattern will maximize grip performance.
- DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled and has a fantastic elastic memory, even after hundreds of thousands of cycles.

Lifting forces

Name	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level	
	60 -kPa	90 -kPa	60 -kPa	90 -kPa
DCF65P	143/141*	193/191*	146/100*	196/134*
DCF90P	255/222*	311/310*	256/183*	358/248*
DCF110P	315/313*	436/433*	377/287*	573/358*

* Dry metal sheet/Oily metal sheet.

General specifications

Name	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm ³
DCF65P	67.5	37.6	95	9.35	23.9
DCF90P	92.5	41.6	130	12.8	57.5
DCF110P	112.5	50	153	16.05	110.2

Available materials

Name	PU60°/PU60°/PU30°
DCF65P	●
DCF90P	●
DCF110P	●

Applications

Table shows typical applications for the suction cup. For more detailed information, please visit piab.com.

Name	Oily sheet metal
DCF65P	●
DCF90P	●
DCF110P	●

Ordering information

Name	Art. no.
Suction cup DCF65P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206535
Suction cup DCF65P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206536
Suction cup DCF65P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206537
Suction cup DCF65P Polyurethane 60/60/30, G3/8" female plastic	0206538
Suction cup DCF65P Polyurethane 60/60/30, T-slot, with mesh filter	0206539
Suction cup DCF65P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206794
Suction cup DCF90P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206540
Suction cup DCF90P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206541
Suction cup DCF90P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206542
Suction cup DCF90P Polyurethane 60/60/30, G3/8" female plastic	0206543
Suction cup DCF90P Polyurethane 60/60/30, T-slot, with mesh filter	0206544
Suction cup DCF90P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206795
Suction cup DCF110P Polyurethane 60/60/30, 3/8" NPT female, with mesh filter	0206545
Suction cup DCF110P Polyurethane 60/60/30, G3/8" male, 1/8" NPSF female, with mesh filter	0206546
Suction cup DCF110P Polyurethane 60/60/30, G3/8" female, with mesh filter	0206547
Suction cup DCF110P Polyurethane 60/60/30, G3/8" female plastic	0206548
Suction cup DCF110P Polyurethane 60/60/30, T-slot, with mesh filter	0206549
Suction cup DCF110P Polyurethane 60/60/30, G1/4" female, with mesh filter	0206796

Flat concave friction family (FCF)



- Special designed friction cups for oily surfaces, such as sheets in metal forming processes.
- Normal wear on friction cup will not affect the long term shear force performance.
- Best choice if $> 0.1\text{g/m}^2$ press oil is used on the sheet.
- Thanks to the strong grip on oily surfaces, the suction cups can withstand high shear forces, typically 2–4 times more than corresponding conventional suction cups.
- The “FCF” design is suitable for slightly domed and flat surfaces, e.g., such as those encountered when handling metal sheets in press lines.
- The suction cups have support cleats that prevent thin objects from being disfigured.
- DURAFLEX® suction cups manufactured in a specially developed material that features the elasticity of rubber and wear resistance of polyurethane. The material does not leave any marks on the objects handled.

Lifting forces

Name	Lifting force vertical to the surface, N, at vacuum level		Lifting force parallel to the surface, N, at vacuum level	
	60 -kPa	90 -kPa	60 -kPa	90 -kPa
FCF25P	19/19*	28/29*	7/5*	10/7.2*
FCF35P	42/34*	58/50*	30/26*	42/32*
FCF50P	78/72*	106/101*	77/52*	105/70*
FCF75P	171/163*	236/228*	166/104*	211/139*
FCF100P	347/236*	490/298*	337/139*	484/205*
FCF125P	475/405*	650/442*	445/194*	602/236*

* Dry metal sheet/Oily metal sheet.

General specifications

Name	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm ³
FCF25P	25	28	27	—	5.5
FCF35P	35	29–47.8*	40	2	5
FCF50P	50	31–49.9*	50	3	10
FCF75P	75	31–41*	100	4	30

Name	Outer diameter, mm	Height, mm	Min. curve radius, mm	Max. vertical movement, mm	Volume, cm ³
FCF100P	100	36–45*	150	6	70
FCF125P	126	42–51.2*	150	8	100

* Height range includes fittings.

Available materials

Name	PU55°/PU60°
FCF25P	●
FCF35P	●
FCF50P	●
FCF75P	●
FCF100P	●
FCF125P	●

Applications

Table shows typical applications for the suction cup. For more detailed information, please visit piab.com.

Name	Oily sheet metal
FCF25P	●
FCF35P	●
FCF50P	●
FCF75P	●
FCF100P	●
FCF125P	●

Ordering information

Name	Art. no.	
Suction cup FCF25P Polyurethane 55/60, 3/8" NPT female	0206916	New!
Suction cup FCF25P Polyurethane 55/60, G1/4" female	0206919	New!
Suction cup FCF25P Polyurethane 55/60, G3/8" female	0206909	New!
Suction cup FCF25P Polyurethane 55/60, G3/8" female plastic	0206895	New!
Suction cup FCF25P Polyurethane 55/60, G3/8" male, 1/8" NPSF female	0201827	
Suction cup FCF25P Polyurethane 55/60, T-slot	0206926	New!
Suction cup FCF35P Polyurethane 55/60, 3/8" NPT female	0122282	
Suction cup FCF35P Polyurethane 55/60, G1/4" female	0206921	New!
Suction cup FCF35P Polyurethane 55/60, G3/8" female	0118981	
Suction cup FCF35P Polyurethane 55/60, G3/8" female plastic	0206893	New!
Suction cup FCF35P Polyurethane 55/60, G3/8" female, 17 mm thread	0200652	
Suction cup FCF35P Polyurethane 55/60, G3/8" male, with mesh filter	0119913	
Suction cup FCF35P Polyurethane 55/60, M10x1.5 male	0121431	
Suction cup FCF35P Polyurethane 55/60, T-slot, with mesh filter	0206927	New!
Suction cup FCF50P Polyurethane 55/60, 3/8" NPT female	0122283	
Suction cup FCF50P Polyurethane 55/60, G1/4" female	0206936	New!
Suction cup FCF50P Polyurethane 55/60, G3/8" female	0118986	

Name	Art. no.	
Suction cup FCF50P Polyurethane 55/60, G3/8" female plastic	0206606	New!
Suction cup FCF50P Polyurethane 55/60, G3/8" female, 17 mm thread	0200685	
Suction cup FCF50P Polyurethane 55/60, G3/8" male, with mesh filter	0118985	
Suction cup FCF50P Polyurethane 55/60, M10x1.5 male	0121432	
Suction cup FCF50P Polyurethane 55/60, T-slot, with mesh filter	0206929	New!
Suction cup FCF75P Polyurethane 55/60, 3/8" NPT female	0122284	
Suction cup FCF75P Polyurethane 55/60, G1/4" female	0206937	New!
Suction cup FCF75P Polyurethane 55/60, G3/8" female	0118429	
Suction cup FCF75P Polyurethane 55/60, G3/8" female, 17 mm thread	0200687	
Suction cup FCF75P Polyurethane 55/60, G3/8" female, plastic thread	0124718	
Suction cup FCF75P Polyurethane 55/60, G3/8" male, with mesh filter	0118423	
Suction cup FCF75P Polyurethane 55/60, M10x1.5 male	0121433	
Suction cup FCF75P Polyurethane 55/60, T-slot, with mesh filter	0206930	New!
Suction cup FCF100P Polyurethane 55/60 G3/8" male, with mesh filter	0118430	
Suction cup FCF100P Polyurethane 55/60, 3/8" NPT female	0122285	
Suction cup FCF100P Polyurethane 55/60, G1/4" female	0206938	New!
Suction cup FCF100P Polyurethane 55/60, G3/8" female	0118432	
Suction cup FCF100P Polyurethane 55/60, G3/8" female, 17 mm thread	0200690	
Suction cup FCF100P Polyurethane 55/60, G3/8" female, plastic thread	0124669	
Suction cup FCF100P Polyurethane 55/60, M10x1.5 male	0121385	
Suction cup FCF100P Polyurethane 55/60, T-slot, with mesh filter	0206931	New!
Suction cup FCF125P Polyurethane 55/60, 3/8" NPT female	0122286	
Suction cup FCF125P Polyurethane 55/60, G1/4" female	0206939	New!
Suction cup FCF125P Polyurethane 55/60, G3/8" female	0118437	
Suction cup FCF125P Polyurethane 55/60, G3/8" female, 17 mm thread	0200693	
Suction cup FCF125P Polyurethane 55/60, G3/8" female, plastic thread	0124787	
Suction cup FCF125P Polyurethane 55/60, G3/8" male, with mesh filter	0118435	
Suction cup FCF125P Polyurethane 55/60, M10x1.5 male	0121435	
Suction cup FCF125P Polyurethane 55/60, T-slot, with mesh filter	0206932	New!

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Transmission



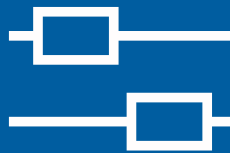
Handling



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