

# Flat family (F)



There is a variety of cups in this family to suit a number of different flat surfaces, e.g. cardboard, glass and metal sheets. The cleats stop deformation by preventing suction of the object into the cup. The suction cup has good stability and very little movement. Also suitable when the lifting force is parallel to the surface as the cleats increase friction. There is also a variety in materials from mark-free to high temperature applications and FDA compliant material (FDA 21 CFR 177.2600) that meets EU's regulation EU 1935/2004.

## Lifting forces

	Lifting force vertical to the surface, lbf, at vacuum level			Lifting force parallel to the surface, lbf, at vacuum level		
	6 -inHg	18 -inHg	27 -inHg	6 -inHg	18 -inHg	27 -inHg
F15	0.79	1.91	2.47	0.79	1.46	1.69
F20	1.35	3.26	4.27	1.12	1.80	1.91
F25	2.02	4.38	5.62	1.80	2.02	2.25
F30-2	2.70	5.62	6.97	2.47	3.60	4.50
F40-2	4.50	8.99	11.2	3.37	5.62	6.74
F50-2	8.09	16.6	21.6	5.40	8.99	11.2
F75	18.0	45.0	60.7	13.5	24.7	31.5
F110	31.5	94.4	125.9	31.5	56.2	67.4
F150	67.4	191.1	247.3	56.2	134.9	179.8
F26 FDA	2.47	5.62	6.97	2.02	4.72	5.85
F33 FDA	3.60	8.54	11.0	3.03	7.31	9.33
F75P	15.7/18.4*	43.4/51.9*	61.4/74.2*	9.89/10.6*	39.6/25.4*	69.2/38.0*
F110P	37.5/42.9*	97.1/112.0*	132.9/158.5*	33.5/66.8*	99.1/117.6*	138.7/149.3*
F15MF	0.90	1.80	2.70	1.01	2.02	3.26
F20MF	0.81	3.26	4.95	1.80	3.26	4.72
F25MF	1.42	5.51	7.89	2.02	5.51	8.16
F30MF	2.47	7.76	10.8	3.06	6.29	9.44
F40MF	4.05	12.8	18.7	3.60	11.0	12.8
F50MF	5.51	20.7	31.7	6.97	18.4	24.1
XLF150	74.2/116.9**	112.4/173.1**	175.4/254.0**	63.2	95.5	149.0
XLF200	170.9/231.6**	254.0/339.5**	386.7/494.6**	145.2	216.0	328.7
XLF250	294.5/368.7**	438.4/553.0**	645.2/795.8**	250.4	372.7	548.5
XLF300	483.3/589.0**	719.4/845.3**	1040.9/1225.2**	411.0	611.5	884.8

\* PU30°/PU60° / PU60°, \*\* Inner/Outer lip

## General specifications

	Outer diameter, in	Height, in	Min. curve radius, in	Max. vertical movement, in	Volume, in <sup>3</sup>
F15	0.62	0.43	0.51	0.04	0.02
F20	0.87	0.31	0.71	0.06	0.06
F25	1.06	0.35	0.87	0.06	0.07
F30-2	1.26	0.41	0.98	0.08	0.12
F40-2	1.65	0.51	2.05	0.10	0.29
F50-2	2.09	0.69	2.17	0.12	0.61
F75	3.03	0.51	5.91	0.12	1.22
F110	4.41	0.79	9.84	0.16	4.27
F150	5.98	1.04	19.7	0.24	9.76
F26 FDA	1.02	0.93	0.98	0.06	0.10
F33 FDA	1.30	0.93	1.38	0.06	0.13
F75P	3.03	0.51	5.91	0.08	1.16
F110P	4.53	0.79	9.84	0.16	3.66
F15MF	0.65	0.43	0.67	0.04	0.02
F20MF	0.87	0.31	0.71	0.08	0.06
F25MF	1.06	0.35	0.91	0.06	0.07
F30MF	1.26	0.39	1.73	0.06	0.12
F40MF	1.65	0.51	2.36	0.08	0.29
F50MF	2.09	0.69	3.74	0.08	0.61
XLF150	6.02	1.06	19.7	0.31	8.85
XLF200	8.03	1.06	31.5	0.31	16.8
XLF250	9.84	1.06	51.2	0.31	26.5
XLF300	12.0	1.06	74.8	0.31	40.6

## Available materials

	Chloroprene, CR	HNBR	Nitrile-PVC, NPV	PU30°/PU60°	PU60°	Silicone, SIL	Silicone FDA EU, SIL FDA	Thermoplastic Polyurethane, TPE-U
F15	●					●	●	
F20	●					●	●	
F25	●					●	●	
F75		●	●			●	●	
F110		●	●			●	●	
F150			●			●	●	
F26 FDA							●	
F33 FDA							●	
F30-2	●					●	●	
F40-2			●			●	●	
F50-2		●	●			●	●	
F75P				●	●			

	Chloroprene, CR	HNBR	Nitrile-PVC, NPV	PU30°/PU60°	PU60°	Silicone, SIL	Silicone FDA EU, SIL FDA	Thermoplas- tic Polyure- thane, TPE-U
F110P				●	●			
F15MF								●
F20MF								●
F25MF								●
F30MF								●
F40MF								●
F50MF								●
XLF150			●					
XLF200			●					
XLF250			●					
XLF300			●					

## Material resistance

For more material information go to page 23.

## Applications

Table shows typical applications for the suction cup. For more detailed information, please visit [piab.com](http://piab.com).

	Dry sheet metal	Bag opening/ thin paper – slip sheets/ film	FDA EU- standard com- pliant	Glass handling	High/low temp cup (plastic)	Mark free	Plastic injec- tion molded parts
F15	●		●				
F20	●		●				
F25	●		●				
F75	●		●	●	●	●	●
F110	●		●	●	●	●	●
F150	●		●				
F26 FDA		●	●				
F33 FDA		●	●				
F30-2	●		●				
F40-2	●		●				
F50-2	●		●	●	●	●	●
F75P	●					●	
F110P	●					●	
F15MF						●	
F20MF						●	
F25MF						●	
F30MF						●	

	Dry sheet metal	Bag opening/ thin paper – slip sheets/ film	FDA EU- standard com- pliant	Glass handling	High/low temp cup (plastic)	Mark free	Plastic injec- tion molded parts
F40MF						●	
F50MF						●	
XLF150	●			●		●	
XLF200	●			●		●	
XLF250	●			●		●	
XLF300	●			●		●	

## Fittings

For a table of possible fittings to use go to page 80 for technical information on all fittings visit [piab.com](http://piab.com).

## Ordering information

For a complete list of available cups and combinations with further information visit [piab.com](http://piab.com). On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register to receive full access to all resources available.