

SUCTION CUPS / Mark free flat Structure

FF10

Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF10 | 0.01 | 0.18 | 0.38 | 0.55 |

※ The lifting force above does not include safety factor

Material Specifications

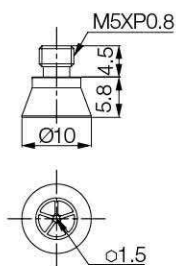
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

Dimension

[Unit : mm]



[With M5M fitting]

Build an Ordering No.

FF10 -  : Pre-mounted fitting
 1. Suction Cup

| 1. Suction cup | Description | Symbol |
|----------------|---|-------------------|
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, Nitrile (NBR) | FF10-N-M5M |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, Silicone | FF10-S-M5M |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, White silicone | FF10-WS-M5M |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, White silicone (FDA) | FF10-WS-M5M (FDA) |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, High temperature silicone | FF10-HS-M5M |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, Conductive silicone | FF10-CS-M5M |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, Urethane | FF10-U-M5M |
| | Mark free and Flat structure suction cup, 10mm diameter, M5 male fitting, Mark free | FF10-A-M5M |

SUCTION CUPS / Mark free flat Structure

FF15



Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF15 | 0.04 | 0.35 | 0.9 | 1.20 |

※ The lifting force above does not include safety factor

Material Specifications

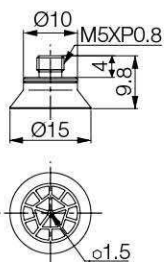
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

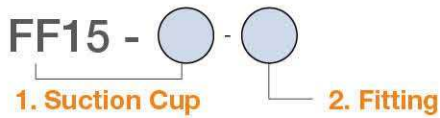
Dimension

[Unit : mm]



[With M5M fitting]

Build an Ordering No.



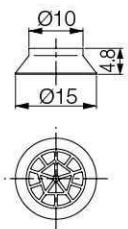
| 1. Suction cup | Description | Symbol |
|----------------|--|---------------|
| | Mark free and Flat structure suction cup, 15mm diameter, Nitrile (NBR) | FF15-N |
| | Mark free and Flat structure suction cup, 15mm diameter, Silicone | FF15-S |
| | Mark free and Flat structure suction cup, 15mm diameter, White silicone | FF15-WS |
| | Mark free and Flat structure suction cup, 15mm diameter, White silicone (FDA) | FF15-WS (FDA) |
| | Mark free and Flat structure suction cup, 15mm diameter, High temperature silicone | FF15-HS |
| | Mark free and Flat structure suction cup, 15mm diameter, Conductive silicone | FF15-CS |
| | Mark free and Flat structure suction cup, 15mm diameter, Urethane | FF15-U |
| | Mark free and Flat structure suction cup, 15mm diameter, Mark free | FF15-A |
| 2. Fitting | Description | Symbol |
| | Fitting, M5 male | M5M |

Spare Parts – Rubber Parts

| Part No. | Description | Weight (g) | Color |
|---------------|--|------------|-------------------|
| FF15-N | Mark free and Flat structure suction cup, 15mm diameter, Nitrile (NBR) | 0.91 | Black |
| FF15-S | Mark free and Flat structure suction cup, 15mm diameter, Silicone | 0.86 | Red |
| FF15-WS | Mark free and Flat structure suction cup, 15mm diameter, White silicone | 0.88 | Translucent White |
| FF15-WS (FDA) | Mark free and Flat structure suction cup, 15mm diameter, White silicone (FDA) | 0.88 | Translucent White |
| FF15-HS | Mark free and Flat structure suction cup, 15mm diameter, High temperature silicone | 0.94 | Blue |
| FF15-CS | Mark free and Flat structure suction cup, 15mm diameter, Conductive silicone | 0.9 | Smoky Black |
| FF15-U | Mark free and Flat structure suction cup, 15mm diameter, Urethane | 0.94 | Dark Green |
| FF15-A | Mark free and Flat structure suction cup, 15mm diameter, Mark free | 0.98 | Black |

Dimension

[Unit : mm]



Spare Parts – Fittings

| Part No. (Code No.) | Fitting size | Description | Weight (g) |
|---------------------|--------------|-------------|------------|
| 350 007 0101 | M5M | M5 male | 1.41 |

SUCTION CUPS / Mark free flat Structure

FF20



Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF20 | 0.07 | 0.54 | 1.35 | 1.6 |

※ The lifting force above does not include safety factor

Material Specifications

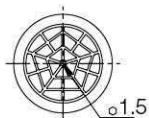
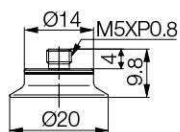
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

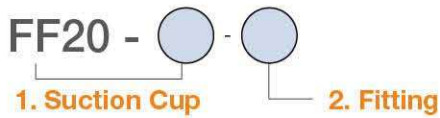
Dimension

[Unit : mm]



[With M5M fitting]

Build an Ordering No.



| 1. Suction cup | Description | Symbol |
|----------------|--|---------------|
| | Mark free and Flat structure suction cup, 20mm diameter, Nitrile (NBR) | FF20-N |
| | Mark free and Flat structure suction cup, 20mm diameter, Silicone | FF20-S |
| | Mark free and Flat structure suction cup, 20mm diameter, White silicone | FF20-WS |
| | Mark free and Flat structure suction cup, 20mm diameter, White silicone (FDA) | FF20-WS (FDA) |
| | Mark free and Flat structure suction cup, 20mm diameter, High temperature silicone | FF20-HS |
| | Mark free and Flat structure suction cup, 20mm diameter, Conductive silicone | FF20-CS |
| | Mark free and Flat structure suction cup, 20mm diameter, Urethane | FF20-U |
| | Mark free and Flat structure suction cup, 20mm diameter, Mark free | FF20-A |

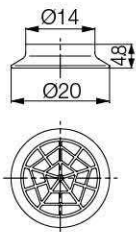
| 2. Fitting | Description | Symbol |
|------------|------------------|--------|
| | Fitting, M5 male | M5M |

Spare Parts – Rubber Parts

| Part No. | Description | Weight (g) | Color |
|---------------|--|------------|-------------------|
| FF20-N | Mark free and Flat structure suction cup, 20mm diameter, Nitrile (NBR) | 0.99 | Black |
| FF20-S | Mark free and Flat structure suction cup, 20mm diameter, Silicone | 0.94 | Red |
| FF20-WS | Mark free and Flat structure suction cup, 20mm diameter, White silicone | 0.96 | Translucent White |
| FF20-WS (FDA) | Mark free and Flat structure suction cup, 20mm diameter, White silicone (FDA) | 0.96 | Translucent White |
| FF20-HS | Mark free and Flat structure suction cup, 20mm diameter, High temperature silicone | 1.02 | Blue |
| FF20-CS | Mark free and Flat structure suction cup, 20mm diameter, Conductive silicone | 0.98 | Smoky Black |
| FF20-U | Mark free and Flat structure suction cup, 20mm diameter, Urethane | 1.02 | Dark Green |
| FF20-A | Mark free and Flat structure suction cup, 20mm diameter, Mark free | 1.06 | Black |

Dimension

[Unit : mm]



Spare Parts – Fittings

| Part No. (Code No.) | Fitting size | Description | Weight (g) |
|---------------------|--------------|-------------|------------|
| 350 007 0102 | M5M | M5 male | 2.59 |

SUCTION CUPS / Mark free flat Structure

FF25



Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF25 | 0.11 | 0.86 | 1.40 | 1.60 |

※ The lifting force above does not include safety factor

Material Specifications

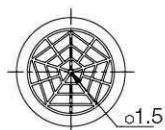
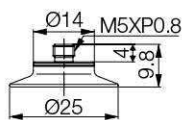
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

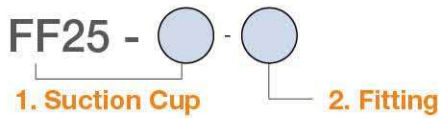
Dimension

[Unit : mm]



[With M5M fitting]

Build an Ordering No.



| 1. Suction cup | Description | Symbol |
|----------------|--|---------------|
| | Mark free and Flat structure suction cup, 25mm diameter, Nitrile (NBR) | FF25-N |
| | Mark free and Flat structure suction cup, 25mm diameter, Silicone | FF25-S |
| | Mark free and Flat structure suction cup, 25mm diameter, White silicone | FF25-WS |
| | Mark free and Flat structure suction cup, 25mm diameter, White silicone (FDA) | FF25-WS (FDA) |
| | Mark free and Flat structure suction cup, 25mm diameter, High temperature silicone | FF25-HS |
| | Mark free and Flat structure suction cup, 25mm diameter, Conductive silicone | FF25-CS |
| | Mark free and Flat structure suction cup, 25mm diameter, Urethane | FF25-U |
| | Mark free and Flat structure suction cup, 25mm diameter, Mark free | FF25-A |

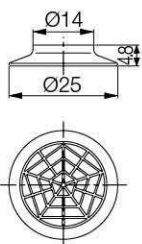
| 2. Fitting | Description | Symbol |
|------------|------------------|--------|
| | Fitting, M5 male | M5M |

Spare Parts – Rubber Parts

| Part No. | Description | Weight (g) | Color |
|---------------|--|------------|-------------------|
| FF25-N | Mark free and Flat structure suction cup, 25mm diameter, Nitrile (NBR) | 1.22 | Black |
| FF25-S | Mark free and Flat structure suction cup, 25mm diameter, Silicone | 1.17 | Red |
| FF25-WS | Mark free and Flat structure suction cup, 25mm diameter, White silicone | 1.18 | Translucent White |
| FF25-WS (FDA) | Mark free and Flat structure suction cup, 25mm diameter, White silicone (FDA) | 1.18 | Translucent White |
| FF25-HS | Mark free and Flat structure suction cup, 25mm diameter, High temperature silicone | 1.26 | Blue |
| FF25-CS | Mark free and Flat structure suction cup, 25mm diameter, Conductive silicone | 1.2 | Smoky Black |
| FF25-U | Mark free and Flat structure suction cup, 25mm diameter, Urethane | 1.26 | Dark Green |
| FF25-A | Mark free and Flat structure suction cup, 25mm diameter, Mark free | 1.31 | Black |

Dimension

[Unit : mm]



Spare Parts – Fittings

| Part No. (Code No.) | Fitting size | Description | Weight (g) |
|---------------------|--------------|-------------|------------|
| 350 007 0102 | M5M | M5 male | 2.59 |

SUCTION CUPS / Mark free flat Structure

FF30

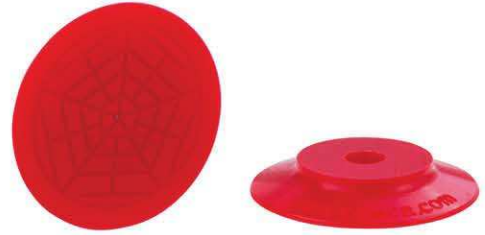


Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF30 | 0.17 | 1.15 | 1.50 | 1.60 |

※ The lifting force above does not include safety factor

Material Specifications

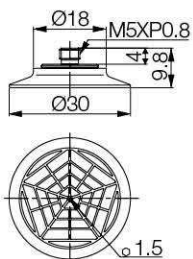
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

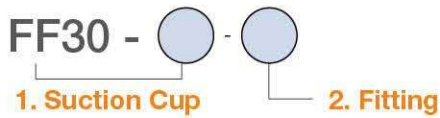
Dimension

[Unit : mm]



[With M5M fitting]

I Build an Ordering No.



| 1. Suction cup | Description | Symbol |
|----------------|--|---------------|
| | Mark free and Flat structure suction cup, 30mm diameter, Nitrile (NBR) | FF30-N |
| | Mark free and Flat structure suction cup, 30mm diameter, Silicone | FF30-S |
| | Mark free and Flat structure suction cup, 30mm diameter, White silicone | FF30-WS |
| | Mark free and Flat structure suction cup, 30mm diameter, White silicone (FDA) | FF30-WS (FDA) |
| | Mark free and Flat structure suction cup, 30mm diameter, High temperature silicone | FF30-HS |
| | Mark free and Flat structure suction cup, 30mm diameter, Conductive silicone | FF30-CS |
| | Mark free and Flat structure suction cup, 30mm diameter, Urethane | FF30-U |
| | Mark free and Flat structure suction cup, 30mm diameter, Mark free | FF30-A |

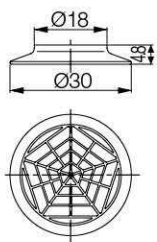
| 2. Fitting | Description | Symbol |
|------------|------------------|--------|
| | Fitting, M5 male | M5M |

I Spare Parts – Rubber Parts

| Part No. | Description | Weight (g) | Color |
|---------------|--|------------|-------------------|
| FF30-N | Mark free and Flat structure suction cup, 30mm diameter, Nitrile (NBR) | 2.07 | Black |
| FF30-S | Mark free and Flat structure suction cup, 30mm diameter, Silicone | 1.97 | Red |
| FF30-WS | Mark free and Flat structure suction cup, 30mm diameter, White silicone | 1.91 | Translucent White |
| FF30-WS (FDA) | Mark free and Flat structure suction cup, 30mm diameter, White silicone (FDA) | 1.91 | Translucent White |
| FF30-HS | Mark free and Flat structure suction cup, 30mm diameter, High temperature silicone | 2.03 | Blue |
| FF30-CS | Mark free and Flat structure suction cup, 30mm diameter, Conductive silicone | 1.95 | Smoky Black |
| FF30-U | Mark free and Flat structure suction cup, 30mm diameter, Urethane | 2.04 | Dark Green |
| FF30-A | Mark free and Flat structure suction cup, 30mm diameter, Mark free | 2.12 | Black |

I Dimension

[Unit : mm]



I Spare Parts – Fittings

| Part No. (Code No.) | Fitting size | Description | Weight (g) |
|---------------------|--------------|-------------|------------|
| 350 007 0102 | M5M | M5 male | 2.59 |

SUCTION CUPS / Mark free flat Structure

FF15X



Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF15X | 0.12 | 0.35 | 0.36 | 0.50 |

※ The lifting force above does not include safety factor

Material Specifications

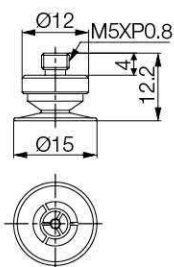
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

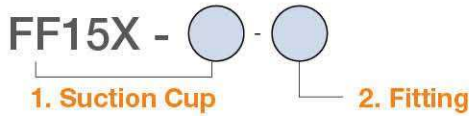
Dimension

[Unit : mm]



[With M5M fitting]

I Build an Ordering No.



| 1. Suction cup | Description | Symbol |
|----------------|--|----------------|
| | Mark free and Flat structure suction cup, 15mm diameter, Nitrile (NBR) | FF15X-N |
| | Mark free and Flat structure suction cup, 15mm diameter, Silicone | FF15X-S |
| | Mark free and Flat structure suction cup, 15mm diameter, White silicone | FF15X-WS |
| | Mark free and Flat structure suction cup, 15mm diameter, White silicone (FDA) | FF15X-WS (FDA) |
| | Mark free and Flat structure suction cup, 15mm diameter, High temperature silicone | FF15X-HS |
| | Mark free and Flat structure suction cup, 15mm diameter, Conductive silicone | FF15X-CS |
| | Mark free and Flat structure suction cup, 15mm diameter, Urethane | FF15X-U |
| | Mark free and Flat structure suction cup, 15mm diameter, Mark free | FF15X-A |

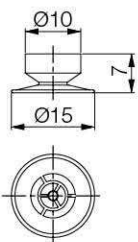
| 2. Fitting | Description | Symbol |
|------------|------------------|--------|
| | Fitting, M5 male | M5M |

I Spare Parts – Rubber Parts

| Part No. | Description | Weight (g) | Color |
|----------------|--|------------|-------------------|
| FF15X-N | Mark free and Flat structure suction cup, 15mm diameter, Nitrile (NBR) | 0.46 | Black |
| FF15X-S | Mark free and Flat structure suction cup, 15mm diameter, Silicone | 0.43 | Red |
| FF15X-WS | Mark free and Flat structure suction cup, 15mm diameter, White silicone | 0.44 | Translucent White |
| FF15X-WS (FDA) | Mark free and Flat structure suction cup, 15mm diameter, White silicone (FDA) | 0.44 | Translucent White |
| FF15X-HS | Mark free and Flat structure suction cup, 15mm diameter, High temperature silicone | 0.47 | Blue |
| FF15X-CS | Mark free and Flat structure suction cup, 15mm diameter, Conductive silicone | 0.45 | Smoky Black |
| FF15X-U | Mark free and Flat structure suction cup, 15mm diameter, Urethane | 0.47 | Dark Green |
| FF15X-A | Mark free and Flat structure suction cup, 15mm diameter, Mark free | 0.49 | Black |

I Dimension

[Unit : mm]



I Spare Parts – Fittings

| Part No. (Code No.) | Fitting size | Description | Weight (g) |
|---------------------|--------------|-------------|------------|
| 350 007 0103 | M5M | M5 male | 2.41 |

SUCTION CUPS / Mark free flat Structure

FF20X



Features and Strengths

Excellent performance for very thin and light weight products
Mark free

Examples of use

Semiconductor, Display, Thin Film



Recommended Lifting Force (Max.)

| Model | Volume (cm ³) | Lifting Force (Kg) - Perpendicular | | |
|-------|---------------------------|------------------------------------|----------|----------|
| | | - 20 kPa | - 60 kPa | - 90 kPa |
| FF20X | 0.12 | 0.35 | 0.36 | 0.50 |

※ The lifting force above does not include safety factor

Material Specifications

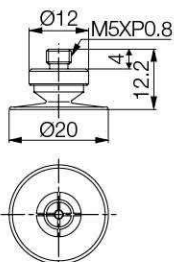
| Material | Hardness Shore (°) | Color | Temperature (°C) |
|----------------------|--------------------|-------------------|------------------|
| NBR | 60 | Black | -20~110 |
| Silicone | 55 | Red | -70~200 |
| White Silicone | 55 | Translucent White | -70~200 |
| White Silicone (FDA) | 55 | Translucent White | -70~200 |
| High temp. Silicone | 50 | Blue | -70~280 |
| Conductive Silicone | 70 | Smoky Black | -45~90 |
| Urethane | 60 | Dark Green | 0~100 |
| Mark Free | 75 | Black | -10~100 |

Material Resistance

| Description | NBR | Silicone | White Silicone | High temp. Silicone | Conductive Silicone | Urethane | Mark Free |
|-----------------|-----------|-----------|----------------|---------------------|---------------------|-----------|-----------|
| Wear Resistance | Excellent | Good | Good | Good | Good | Excellent | Good |
| Oil | Excellent | Poor | Poor | Poor | Poor | Excellent | Excellent |
| Weather / Ozone | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Alcohol | Good | Good | Good | Good | Good | Fair | Good |
| Acid | Fair | Poor | Poor | Poor | Poor | Poor | Excellent |

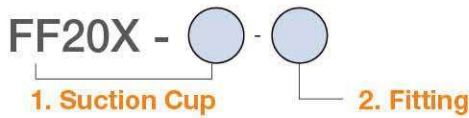
Dimension

[Unit : mm]



[With M5M fitting]

Build an Ordering No.



| 1. Suction cup | Description | Symbol |
|----------------|--|----------------|
| | Mark free and Flat structure suction cup, 20mm diameter, Nitrile (NBR) | FF20X-N |
| | Mark free and Flat structure suction cup, 20mm diameter, Silicone | FF20X-S |
| | Mark free and Flat structure suction cup, 20mm diameter, White silicone | FF20X-WS |
| | Mark free and Flat structure suction cup, 20mm diameter, White silicone (FDA) | FF20X-WS (FDA) |
| | Mark free and Flat structure suction cup, 20mm diameter, High temperature silicone | FF20X-HS |
| | Mark free and Flat structure suction cup, 20mm diameter, Conductive silicone | FF20X-CS |
| | Mark free and Flat structure suction cup, 20mm diameter, Urethane | FF20X-U |
| | Mark free and Flat structure suction cup, 20mm diameter, Mark free | FF20X-A |

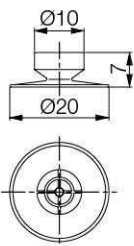
| 2. Fitting | Description | Symbol |
|------------|------------------|--------|
| | Fitting, M5 male | M5M |

Spare Parts – Rubber Parts

| Part No. | Description | Weight (g) | Color |
|----------------|--|------------|-------------------|
| FF20X-N | Mark free and Flat structure suction cup, 20mm diameter, Nitrile (NBR) | 0.5 | Black |
| FF20X-S | Mark free and Flat structure suction cup, 20mm diameter, Silicone | 0.47 | Red |
| FF20X-WS | Mark free and Flat structure suction cup, 20mm diameter, White silicone | 0.48 | Translucent White |
| FF20X-WS (FDA) | Mark free and Flat structure suction cup, 20mm diameter, White silicone (FDA) | 0.48 | Translucent White |
| FF20X-HS | Mark free and Flat structure suction cup, 20mm diameter, High temperature silicone | 0.51 | Blue |
| FF20X-CS | Mark free and Flat structure suction cup, 20mm diameter, Conductive silicone | 0.49 | Smoky Black |
| FF20X-U | Mark free and Flat structure suction cup, 20mm diameter, Urethane | 0.51 | Dark Green |
| FF20X-A | Mark free and Flat structure suction cup, 20mm diameter, Mark free | 0.54 | Black |

Dimension

[Unit : mm]



Spare Parts – Fittings

| Part No. (Code No.) | Fitting size | Description | Weight (g) |
|---------------------|--------------|-------------|------------|
| 350 007 0103 | M5M | M5 male | 2.41 |