

# UE

DEWRINKLED ROLL



FLAT EXPANDER ROLL (FE)

MIRAVO ROLL (MRV)



**Spread**

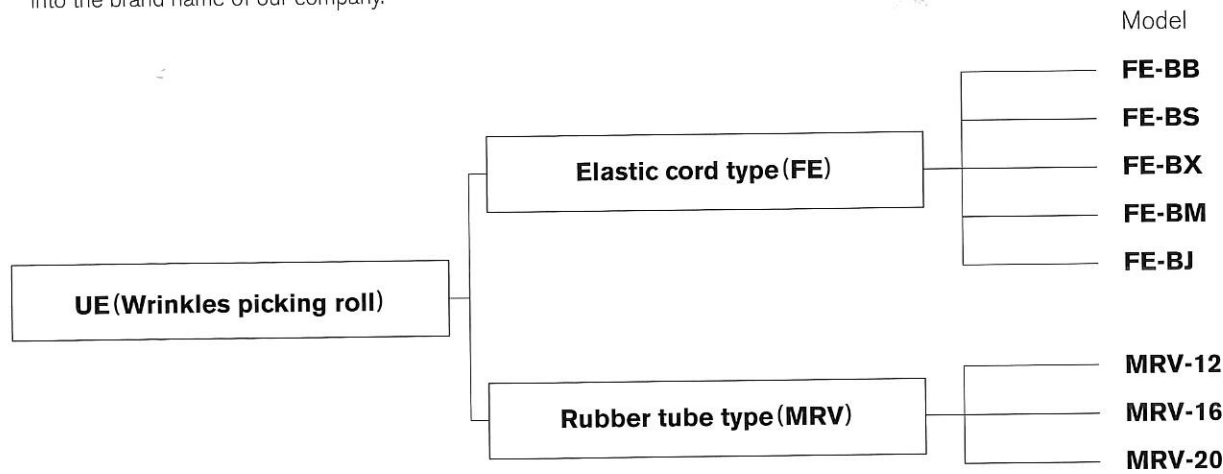
## A natural motion removes the wrinkles of a web gently.

If it is called a wrinkles picking roll, a bow roll (an bow roll, a banana form roll, a curve roll) is common. However, therefore, the form will lengthen the central portion of a web too much than other portions, and the bow roll had a structural defect "it is superfluously extended in the central part and slackens near the edge"

It is UE wrinkles picking roll which was developed in order to solve this problem. The rubber of a roll surface stretches greatly gradually toward both sides from a center. The growth of this rubber has the same effect as turning a web outside, lengthening it from a center, by hand, and eliminating wrinkles. For this reason, the full width of a web can be expanded gently and wrinkles can be removed.

In addition, a wrinkles picking roll has two forms of elastic cord type "a flat expander (FE)" and rubber tube type "Miravo (MRV)." We have dimensions to specifications of a film and the Web using, rubber materials. We have dimensions to specifications of a film and the Web of the errand, rubber materials each. Furthermore, I am planning substantial lineup that it should answer to needs.

※ "UE" is an initial of U-Engineering industrial incorporated company which developed this product group. Although business transfer of the "Wrinkles picking roll" was received in 2005, we are making this initial into the brand name of our company.



## 1. Flat expander (FE)

### 1. Outline

- A flat expander (FE) is a wrinkles picking roll of the shape of an elastic cord type straight line.
- Wrinkles, such as cloth, a nonwoven fabric, a plastic film, paper, and glass fiber, can be removed.
- On the roll perimeter, many elastic cords are stationed equally. Whenever a roll rotates, each elastic cord repeats elasticity. A web is dewrinkled by an elastic cord's growth, if a web is winded while becoming the maximum from the position where an elastic cord begins to be extended. Thereby, wrinkles are removed from a web.
- It is a high-class roll using the parts refined highly. For example, a resin piece for extremely low runs of the coefficient of friction is attached to the undersurface of the elastic cord. Thereby, an elastic cord can be extended progressively, without checking the growth.

## 2. Feature

- **Wrinkles are removed without lengthening a web like a bow roll, since it is a straight line-like roll.**

Neither the superfluous growth in the central part which is easy to cause with a bow roll, nor the slack by near edge position occurs!

- **The installation direction**

The pass line of the Web is equivalent to all directions from stability to verticality. In addition, the web winding angle to a roll is generally used in 30 to 90 degrees.

- **Improvement in a wrinkles picking effect**

An elastic cord is smoothly elongated towards outside from the center of a roll. According to this extension, surface frictional force can pull a web in the direction of the outside of direct. For this reason, the high wrinkles picking effect more than a bow roll is acquired.

- **Further improvement in a life**

It is designed so that the abrasion of the rotary / slide material becomes small and can plan life improvement of the whole roll.

- **Correspondence to a high-speed line**

Various highly efficient high-speed correspondence mechanisms can be established, and it can respond also to a high-speed line.

- **The amount of deployment is simply adjusted with the expanding bolt of roll both sides also in web operation.**

The size of an elastic cord's amount of deployment (growth) can be adjusted by changing degree of the ring in roll both sides. Since the expanding bolt in a ring can be moved also during conveyance of a web, the optimal amount adjustment of deployment is easily possible for it. Inclination of a ring can be checked with an angle scale plate.

- **Use is simply [ immediately ] possible after attachment.**

- **The rubber code of consumables can be renewed easily on the spot.**

## 3. Spread wrinkles principle

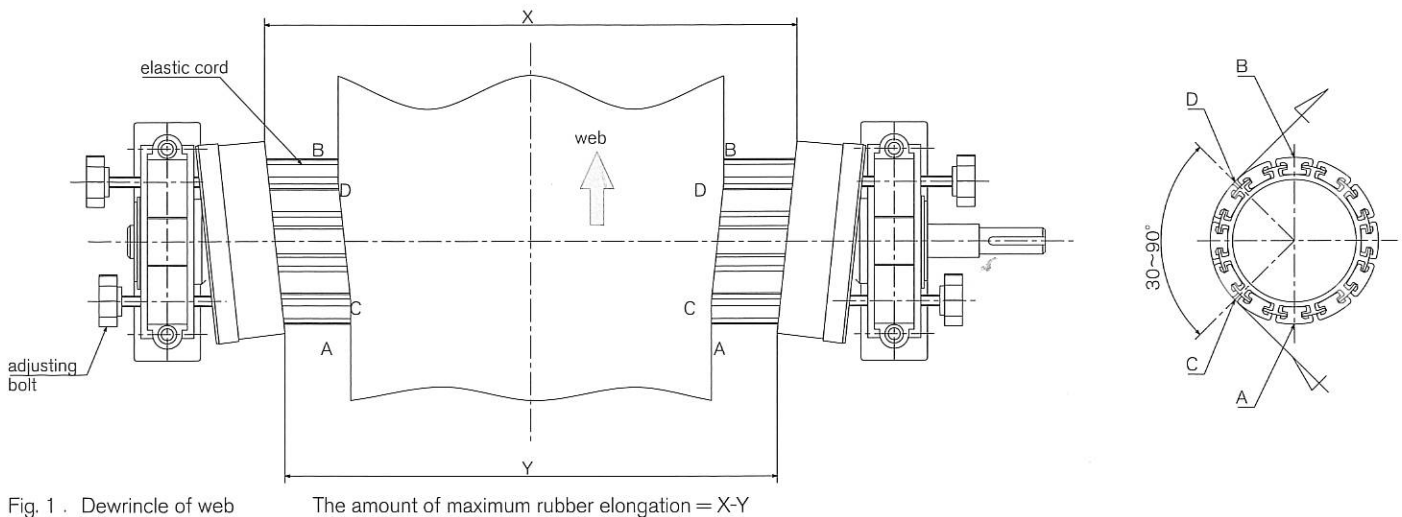
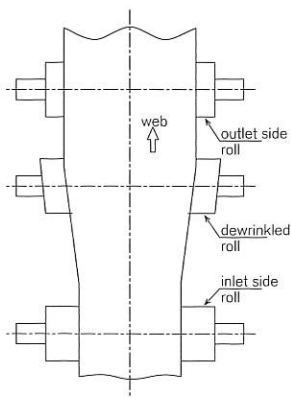


Fig. 1 . Dewrinkle of web



The expanding bolt by the side of [A] a web entrance is pushed in, the adjusting bolt by the side of [B] an exit is pulled back, and as shown in a figure, a ring on either side is made into symmetrical reverse Ha's type.

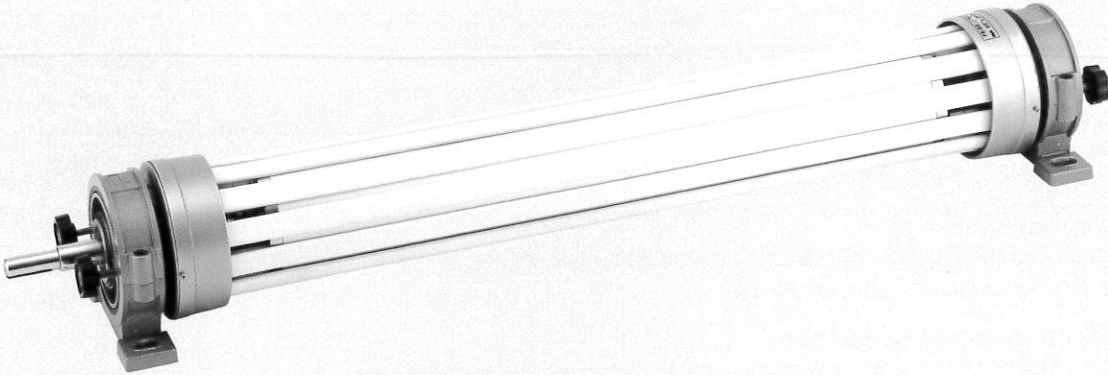
If a roll rotates, it will contract most at A point and a rubber code will carry out the maximum extension at B point. By this, if the web twisted around the roll at C point comes to D point, it dewrinkle only "DD length-CC length." Wrinkles are removed from a web by this dewrinkle action.

(Notes) As character of a wrinkles picking roll, a web is already beginning to spread, before touching on a wrinkles picking roll. That is, distance with the entrance side roll becomes important. A wrinkles picking effect is changed by tension and Young's modulus of a web. Since rigid high metallic foil cannot be extended easily for the reason, it is necessary to take much distance with the entrance side roll. The soft web extended easily can fully eliminate wrinkles also in a short distance.

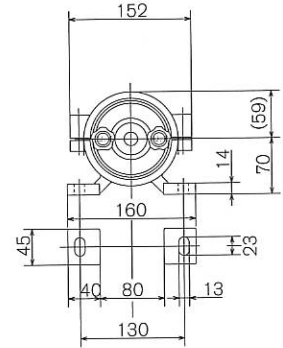
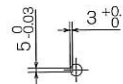
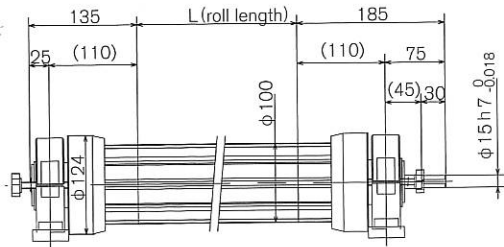
Please install a wrinkles picking roll near the exit side roll as much as possible. Moreover, please coincide the center of roll length focusing on conveyance of a machine, and attach it.

**4. Specification**

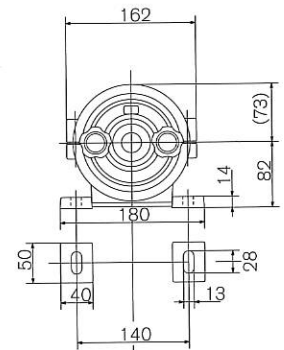
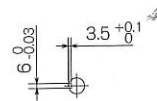
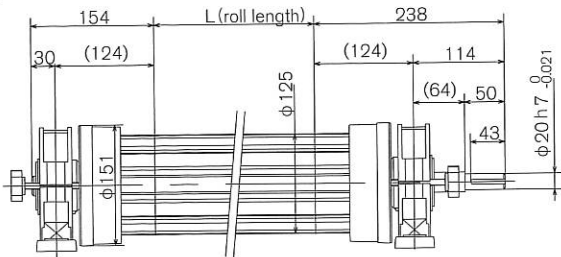
**Flat expander (FE)**



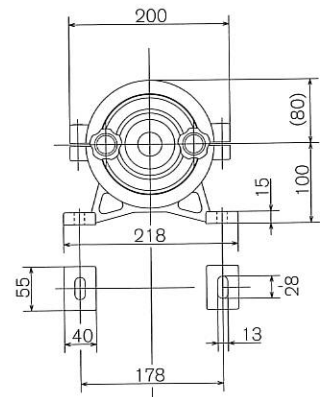
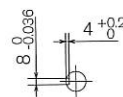
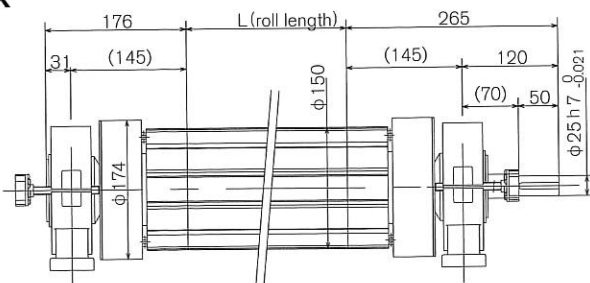
**FE-BB**



**FE-BS**



**FE-BX**



**[Specification] ※ 1**

Model	Diameter of a roll (mm)	Roll length (mm)	Elongation rubber (mm) ※ 2	Starting torque (N/m) ※ 3	Allowable tension (N)	Line speed (m/min) ※ 4	Amount of bending (Less than [mm]) ※ 5	Total mass (kg) ※ 6
<b>FE-BB</b>	100	150 ~ 1000	5.2	0.53 ~ 0.22	245	150	0.2 ~ 0.6	9 ~ 18
<b>FE-BS</b>	125	300 ~ 2000	6.5	0.73 ~ 0.59	294	250	0.1 ~ 0.2	17 ~ 32
<b>FE-BX</b>	150	1000 ~ 3000	7.8	0.66 ~ 0.73	588	400	0.1 ~ 0.5	37 ~ 61
<b>FE-BM</b>	200	2000 ~ 4500	10.4	1.12 ~ 1.22	784	450	0.2 ~ 0.6	94 ~ 138
<b>FE-BJ</b>	250	2000 ~ 6000	13.1	1.96 ~ 1.94	980	600	0.1 ~ 0.6	151 ~ 257

(※ 1) : It is specification when the winding angle is 90°, ring angle of inclination 3 degrees.

An angle of inclination can be adjusted from 0 times to 6 times.

(※ 2) : It is different from the elongation rubber and the seat quantity to dewrinkle.

(※ 3) : It is the starting torque at the time of the ring angle of gradient three degree.

Moreover, the above-mentioned data is a reference value and changes with roll length and elastic cord quality of the materials.

(※ 4) : Such line speed is changed according to an operating condition, and is not guarantee line speed.

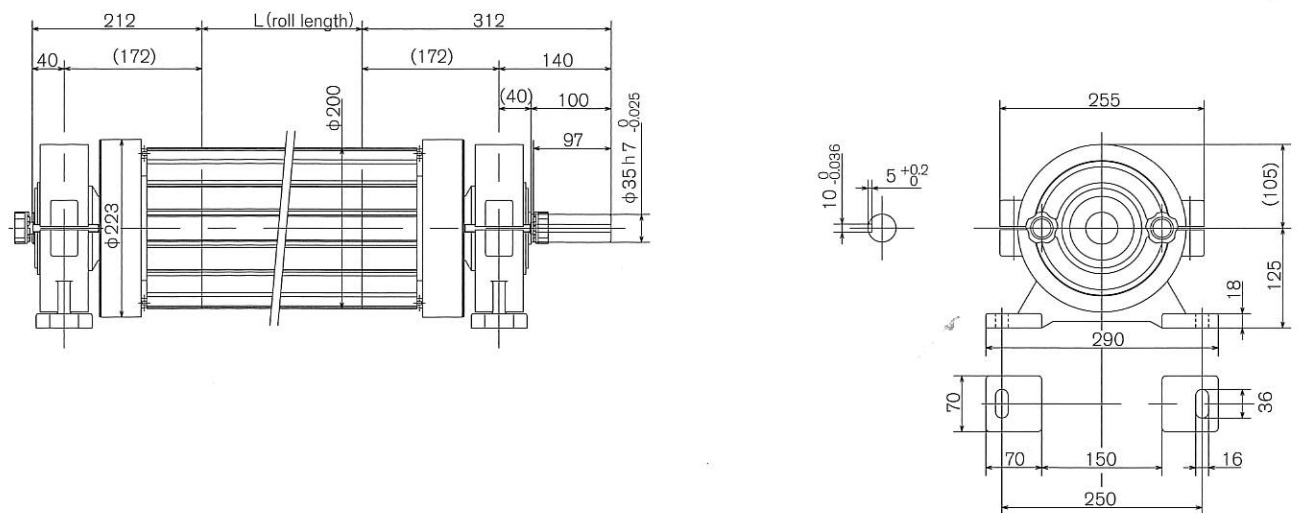
(※ 5) : It is the amount of bending at the time of allowable tension. It changes according to tension and a sheet winding angle.

(※ 6) : It is the total mass of the standard configuration (with a single-sided driving shaft) in the representation roll length of specifications. It changes by composition.

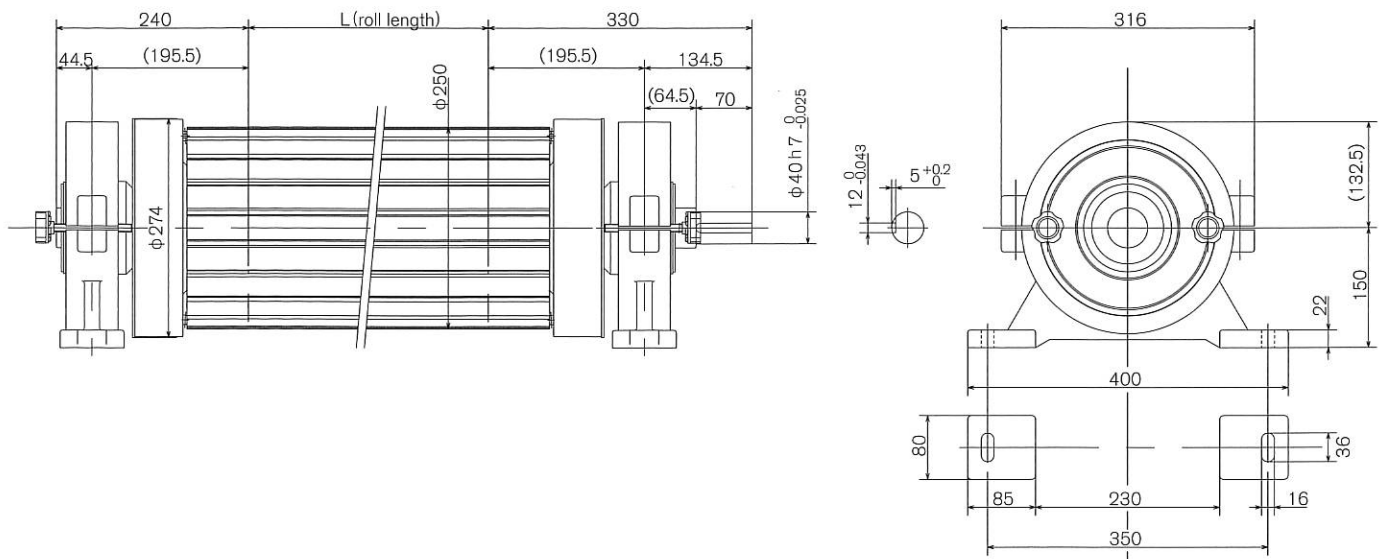
(※ 7) : Please use the environment at dryness (there needs to be no 45 to 85% (RH) dew condensation), and the maximum temperature of 80°C or less.

(※ 8) : When line speed exceeds 100 m/min with BX, BM, and BJ type, an elastic cord comes floating and preventive measures are given.

**FE-BM**



**FE-BJ**



## 2. Miravo (MRV)

### 1. Outline

- Miravo roll (MRV) is a wrinkles picking roll of the shape of a straight line covered with the rubber tube.
- Wrinkles can be removed from a nonwoven fabric, a plastic film, paper, glass fiber, metallic foil, etc.
- The rubber tube covered to the roll perimeter side expands and contracts with roll rotation by a special internal structure. A web is dewrinkled by an elastic cord's growth, if a web is winded while becoming the maximum from the position where a rubber tube begins to be extended. Thereby, wrinkles are removed from a web.

### 2. Feature

- **Wrinkles are removed without lengthening a web like a bow roll, since it is a straight line-like roll.**  
Neither the superfluous growth in the central part which is easy to cause with a bow roll, nor the slack by near edge position occurs!
- **The installation direction**  
The pass line of the Web is equivalent to all directions from stability to verticality. In addition, the web winding angle to a roll is generally used in 30 to 90 degrees.
- **It is applicable to widespread Web materials**  
The wrinkles of a web material with an elasticity film [being ultra-thin (several microns)] to wide range rigid high metallic foil, such as Cu and aluminum, are removed.
- **Deployment of a rubber tube**  
Many rings are arranged inside the rubber tube. Inclination of this ring increases in the direction of a roll end from a center. A rubber tube is gradually lengthened by the difference of inclination of an adjoining ring. For this reason, since growth increases more nearly linearly compared with FE which pulls and lengthens an elastic cord in a ring on either side, a wrinkles picking effect also improves.
- **Correspondence to a more nearly high-speed line**  
As compared with the elastic cord type (FE) wrinkles picking roll, this rubber tube type (MRV) of wrinkles picking roll is designed so that the correspondence to a high-speed line is more possible. Although the line speed of FE of the outer diameters  $\phi 125$ - $\phi 200$  is 250 - 450 m/min, MRV of  $\phi 120$ - $\phi 200$  can be used in the ultra-high-speed domain of a maximum of 2000 m/min.
- **The pulley for synchronized rotation**  
There is rotary resistance structurally  
When used with low tension, please rotate the MRV itself so that line speed and roll perimeter speed may synchronize using a pulley.
- **Use is simply [ immediately ] possible after attachment.**

### 3. Spread wrinkles principle

As shown in Fig. 2, inside the rubber tube, from the central part, many rings incline symmetrically with the direction of outside in the direction of the length of a roll, and are arranged. And each angle of gradient of these rings is large as it goes to a roll end from the roll central part. ( $\theta, 2\theta, 3\theta, 4\theta, \dots$ ) The difference ( $4\theta-3\theta, 3\theta-2\theta, 2\theta-\theta, \dots$ ) of the angle of inclination of these rings is equal, A uniform developing interaction is attained in the Roll total length.

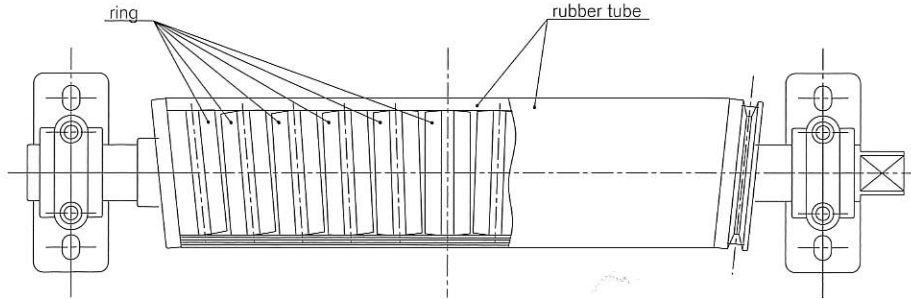


Fig. 2. MRV configuration

As shown in Fig. 3, if a roller rotates it will contract most at A point and a rubber tube will carry out the maximum extension at B point. If the web twisted around the roller at C point comes to D point by this "deployment dewrinkle is carried out by DD length-CC length". Thereby, wrinkles are removed from a web.

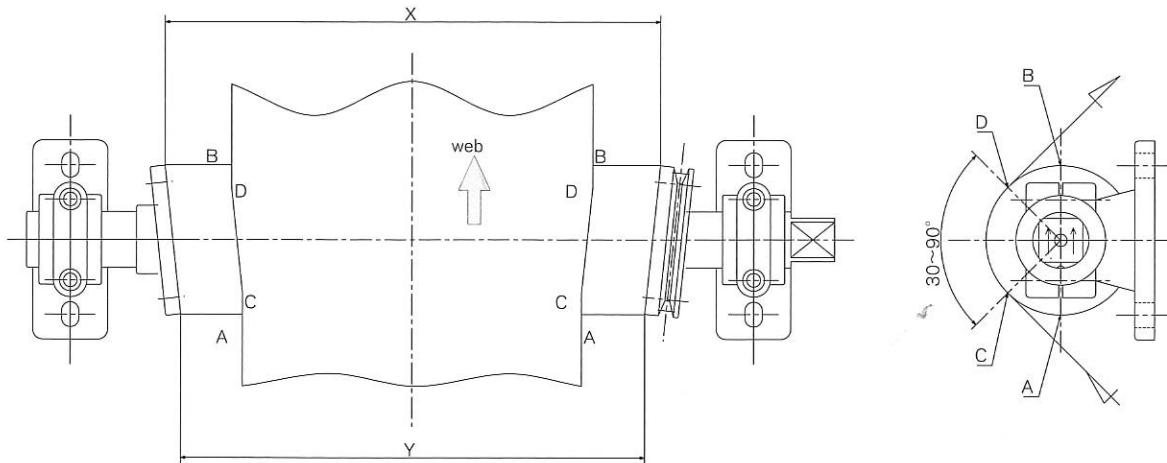
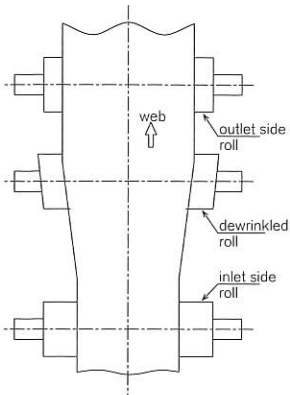


Fig. 3. Dewrinkle of web The amount of maximum rubber deployment = X-Y

(Note)

- ① As character of a wrinkles picking roll, a web is already beginning to spread, before touching on a wrinkles picking roll. That is, distance with the entrance side roll becomes important. A wrinkles picking effect is changed by Young's modulus of tension and a web. Since rigid high metallic foil cannot be extended easily for the reason, it is necessary to take much distance with the entrance side roll. Conversely, the soft web extended easily can fully eliminate wrinkles also in a short distance. Please install a wrinkles picking roll near the exit side roll as much as possible. Moreover, please coincide the center of roll length focusing on conveyance of a machine, and attach it.
- ② The amount of the maximum deployment is decided by how in which rubber stretches according to the angle difference of the inclination ring which arranges MRV inside, and the number of rings. For this reason, the difference of the angle of gradient of a ring will be decided from width, or the quality of the material and the required amount of deployment of a web at the time of an order received.
- ③ Adjustment of the amount of deployment like FE cannot be performed.



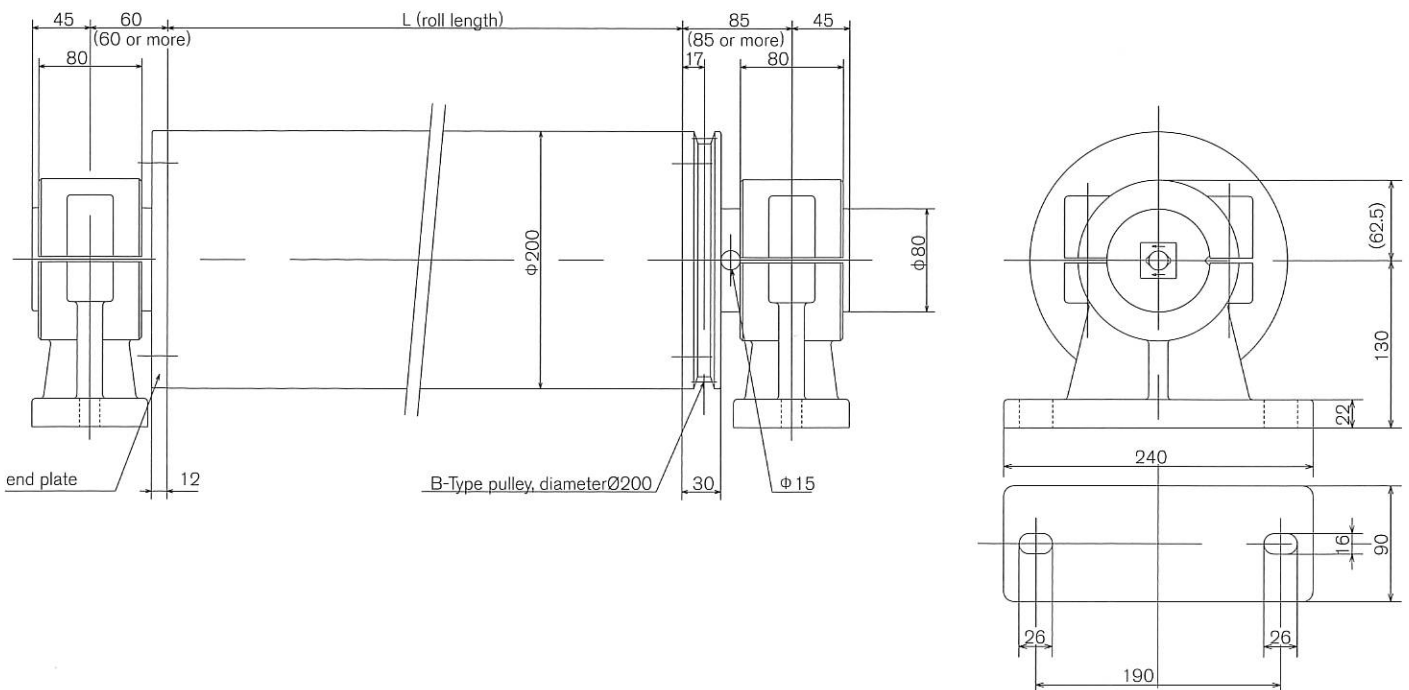


**[Specification] ※ 1**

Model	Diameter of a roll (mm)	Roll length (mm) ※ 2	Elongation rubber (mm) ※ 3,4	Starting torque (N/m) ※ 5	Allowable tension (N)	Line speed (m/min) ※ 6	Amount of bending (Less than [mm]) ※ 7	Total mass (kg) ※ 8
<b>MRV-12</b>	120	240 ~ 2040 ※ 40pitches	0.2 ~ 2.5	0.17 ~ 2.89	800	2000 ~ 280	0.1 ~ 1.5	16 ~ 74
<b>MRV-16</b>	160	300 ~ 2600 ※ 50pitches	0.2 ~ 2.9	0.21 ~ 3.59	1200	2000 ~ 350	0.1 ~ 1.7	30 ~ 157
<b>MRV-20</b>	200	1050 ~ 3450 ※ 75pitches	0.7 ~ 2.5	4.39 ~ 6.55	2000	2000 ~ 380	0.1 ~ 2.2	111 ~ 310

- (※ 1) : It is specification when the winding angle is 90° and the ring of a standard angle is used.
- (※ 2) : Effective roll length is the value which one top of both sides pulled at a time from roll length.  
The sheet applied more than effective roll length may not be dewrinkled.  
MRV-12 : Roll length - 80mm  
MRV-16 : Roll length - 100mm  
MRV-20 : Roll length - 150mm
- (※ 3) : It is different from the elongation rubber and the seat quantity to dewrinkle.
- (※ 4) : Standard common difference of the ring angle which develops a rubber tube (Angle difference of an adjoining ring)  
Standard angle : MRV-12 (3 minutes), MRV-16 (2.5 minutes), MRV-20 (2 minutes)  
We are also preparing rings other than a standard angle. Please consult about the amount of rubber deployment.
- (※ 5) : The above-mentioned data is a reference value and changes with individual specificity at the time of roll length, the rubber quality of the material, or an assembly.
- (※ 6) : It is the line speed at the time of allowable tension.  
Such line speed is changed according to an operating condition, and is not guarantee line speed.
- (※ 7) : It is the amount of bending at the time of allowable tension. It changes according to tension and a sheet winding angle.
- (※ 8) : It is the total mass of our standard configuration (end plate, V belt pulley, with a bearing bracket).  
It changes by composition.
- (※ 9) : Please use the environment at dryness (there needs to be no 45 to 85% (RH) dew condensation), and the maximum temperature of 80°C or less.

**MRV-20**



### 3. Rubber characteristic

The characteristic of material and material currently used for the wrinkles picking roll of our company is as follows. You can choose according to a user's operating condition.

	EPT white / black ※ 1	NBR white / black	Silicon	Urethane
<b>FE</b>	○	×	○	○
<b>MRV</b> ※ 2	○	○	○	×

(※ 1) : Ethylene propylene terpolymer : This is also called EPDM.

(※ 2) : MRV can also manufacture the rubber of special specification, and the rubber specified by a user in addition to the above-mentioned rubber. Please consult.

(※ 3) : Although a pattern like a spot or a stain may be made in the process in which a rubber tube is manufactured in a roll surface, the mechanical performance of rubber is not affected and there is no problem in quality and performance.

	EPT white / black	NBR white / black	Silicon	Urethane
permanent set resistance	○	○	◎	◎
abrasion resistance	○/◎	○	△	◎
tensile strength	○/◎	○	△	◎
conductivity	×/◎	×/◎	×	×
oil resistance	×	◎	△	◎
water resistance	◎	◎	◎	×
alkali resistance	◎	◎	◎	×
acid resistance	◎	○	×	×
ozone resistance	◎	△	◎	△

### 4. Application machine

- Nonwoven fabric industry : Winding machine, Slitter, Coater machine
- Film industry : Winding machine, Slitter, Printing machine, Coater machine, Vacuum vapor deposition machine
- Glass fiber industry : Loom, Winding machine,
- Paper manufacturing : Winding machine, Slitter, Coater machine
- Metallic foil manufacturing : Production plant of copper foil and the aluminum foil



[www.mitsuhashi-corp.co.jp](http://www.mitsuhashi-corp.co.jp)  
[info@mitsuhashi-corp.co.jp](mailto:info@mitsuhashi-corp.co.jp)

株式会社 三橋製作所  
**MITSUHASHI CORPORATION**

**Head Office**

Postal Code 615-0082 1, Sekizan-cho, Yamanouchi,  
Ukyo-ku, Kyoto, JAPAN  
TEL 81-75-316-3300 (the sales department)  
FAX 81-75-313-7595

**Tokyo Branch (Export Office)**

Postal Code 111-0043 YoshikuniKomagata-bldg.9F,  
2-4-11, Komagata, Taitou-ku, Tokyo, JAPAN  
TEL 81-3-3847-9751  
FAX 81-3-3847-9753

**Kyushu Branch**

Postal Code 812-0016 Minamikindai-bldg.6F,  
4-2-10, Hakataekiminami, Hakata-ku, Fukuoka, JAPAN  
TEL 81-92-476-3800  
FAX 81-92-476-3801

**Shanghai Mitsuhashi trading company**

Room 1314, 36 Lanes, 1200 chang qing Road, Shanghai, CHINA  
TEL & FAX 86-21-5068-5366

In order to improve our products, specifications may change without notice



**KIGENG TRADING CO., LTD.**

**基源貿易有限公司**

新北市中和區中山路2段411號6樓

6F., No. 405, Sec. 2, Jungshan Rd., Junghe  
Dist, New Taipei City, Taiwan 235, R.O.C.

TEL:886-2-2225-7688 FAX:886-2-2225-1978

URL:<http://www.kigeng.com.tw>

E-mail:[sales@kigeng.com.tw](mailto:sales@kigeng.com.tw)

U-001E

160225SK