

66D

TOHO 66D NON-TEX ROLL[®] CATALOGUE

U.S.A Patent:3,853,677. Brasil Patent:8,3000,701.

German Patent:2,301,050. Belgium Patent :786,266. Korean Patent:20,910

Japanese Utility Model:1,276,712. 1,464,107 1,466,110. 1,476,797 1,679,318



Details of new material roll; TOHO 66D NON-TEX-ROLL

66D NON-TEX-ROLL was developed by engineers of TOHO YOGYO CO.,LTD. in 1966. Since then, 66D NON-TEX-ROLLS have been used extensively for all types of applications including Steel, Aluminum, Brass, etc.

The technique for application of 66D NON-TEX-ROLLS is exclusively owned by TOHO YOGYO CO.,LTD.

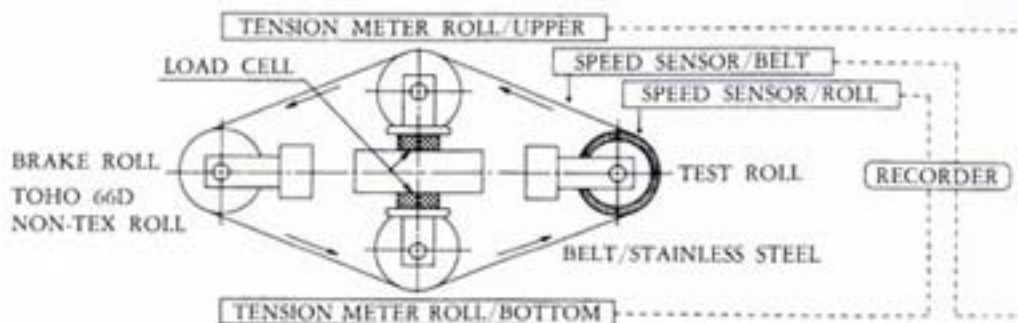
The special features of this roll are higher coefficient of friction, higher shearing stress and higher rigidity than those of a rubber covered roll.

| | |
|-------------------------|--|
| Coefficient of friction | $\mu = 0.682 \sim 0.357$ (Dry-states) $\mu = 0.422 \sim 0.300$ (Wet-states) |
| Shearing stress | 11,760N/cm ² (1,200kgf/cm ²) |

Properties and function of 66D NON-TEX-ROLL

| Type of roll | Property | Function |
|--|--|---------------------------------|
| Wringer roll | Elasticity, Chemical resistanse | Removal of solution |
| Wiper roll, Squeegee roll | Long wearing | Removal of solution |
| Pinch roll, Feed roll, Snubber roll Tension bridle roll | Elasticity, Long wearing Chemical resistanse | Pulling and/or feeding |
| Snubber roll Hold down roll Guiding roll Supporting roll Tension bridle roll Deflector roll | High coefficient of friction | Guiding and changing direction |
| Oiling roll | Long wearing Chemical resistanse, Elasticity | Uniform application of oil film |
| Coil supporting roll, Coil liftig roll, | Elasticity, Long wearing | Keeping coils in good condition |

Measuring machine of friction coefficient and concept of high speed simulator.



Spec. of test machine.

Test roll : $\phi 300 \times 400$
 Tension of belt : max 1,764N (180kgf)
 Belt speed : 100~1,000mpm

Special feature.

1. Detection of influence by air between the test roll and strip.
2. Detection of slippage limit by speed distance between the test roll and strip.

Measuring of friction coefficient

Types of steel strip

- | | |
|---|--|
| a) SS-steel / after ECL before Annealing (T0.19mm×W200mm) | c) SS-steel / after Annealing (T0.72mm×W200mm) |
| b) Galvanizing steel / before Annealing (T0.27mm×W200mm) | d) Spring steel (T0.22mm×W200mm) |

| Strip # | Dry-state | | | | Wet-state | | | |
|---------|-----------|-------|-------|-------|-----------|-------|-------|-------|
| | a | b | c | d | a | b | c | d |
| PC-67 | 0.668 | 0.543 | 0.629 | 0.440 | 0.414 | 0.333 | 0.414 | 0.373 |
| PC-67W | 0.682 | 0.577 | 0.644 | 0.451 | 0.396 | 0.388 | 0.420 | 0.375 |
| PC-83 | 0.655 | 0.555 | 0.608 | 0.432 | 0.399 | 0.346 | 0.389 | 0.342 |
| AT-86 | 0.650 | 0.531 | 0.612 | 0.428 | 0.399 | 0.359 | 0.400 | 0.355 |
| OW-90 | 0.670 | 0.536 | 0.644 | 0.455 | 0.408 | 0.379 | 0.412 | 0.361 |
| OR-210 | 0.596 | 0.480 | 0.574 | 0.357 | 0.381 | 0.353 | 0.415 | 0.314 |
| CR-83 | 0.632 | 0.522 | 0.601 | 0.418 | 0.399 | 0.300 | 0.399 | 0.353 |
| CR-87 | 0.643 | 0.511 | 0.605 | 0.420 | 0.375 | 0.389 | 0.422 | 0.331 |
| OHP-74 | 0.648 | 0.532 | 0.610 | 0.429 | 0.408 | 0.314 | 0.400 | 0.366 |
| OHN-74 | 0.651 | 0.541 | 0.615 | 0.422 | 0.400 | 0.331 | 0.411 | 0.342 |
| MC-350 | 0.643 | 0.528 | 0.620 | 0.386 | 0.386 | 0.357 | 0.415 | 0.329 |
| PC-97 | 0.638 | 0.517 | 0.601 | 0.420 | 0.361 | 0.325 | 0.362 | 0.321 |
| PUR | 0.506 | 0.399 | 0.449 | 0.399 | 0.275 | 0.272 | 0.201 | 0.154 |

Remark : Wettant : Metal guard 816 / 5.8mm²/s(5.8cst) / 1-micron film.
 PUR : Poly uretan rubber



Grade of materials for 66D NON-TEX-ROLL

| Grade | Properties | | | Typical Application |
|--------------------------|----------------------|------------------|----------------------|---|
| | Friction Coefficient | Heat Resistivity | Chemical Resistivity | |
| PC-67 PC-67W OW-90 | 0.682/0.333 | 150°C | pH 7 | Bridle, Deflector, Pinch, Wringer, Squeegee, Wiper, Feeder, Support, Snubber. |
| PC-83 | 0.655/0.342 | 160°C | pH 7 | Wiper, Pinch, Deflector. |
| AT-86 | 0.650/0.355 | 150°C | pH 7 | Bridle, Deflector, Pinch, Wringer, Squeegee, Wiper, Feeder, Support, Snubber. |
| OR-210 | 0.596/0.314 | 150°C | pH 7 | Oiler. |
| OHP-74 | 0.648/0.314 | 100°C | pH Free | Wringer(Acid), Squeegee, Dammy, Deflector |
| OHN-74 | 0.651/0.331 | 150°C | pH 7 ≦ | Wringer(Alkali), Squeegee, Wiper, Pinch. |
| CR-83 | 0.632/0.300 | 180°C | ≦pH 7 | Bridle, Deflector, Pinch, Snubber. |
| CR-87 | 0.643/0.331 | 180°C | ≦pH 7 | Bridle, Deflector, Pinch, Wringer, Squeegee, Wiper, Feeder, Support, Snubber. |
| MC-350 | 0.643/0.329 | 150°C | pH 7 ≦ | Wringer. |
| PC-97 | 0.638/0.321 | 120°C | pH 3 ~ 10 | Wringer, Squeegee, |



Comparison between conventional roll and our newly developed roll.

(for pinch roll, snubber roll, tension bridle, wiper roll,
squeegee roll, deflector roll, and wringer roll.)

Conventional roll (rubber or felt covered roll)

1. When the roll has a crack or scratch on the surface, these defects will cause damage to the strip and will also leave marks which can cause rust on the strip.
2. When handling oiled strip, high line speed can not be attained due to slipping caused by insufficient coefficient of friction.
3. When the strip passes through the loop, the strip force is loaded to one side of the roll covering by 39.2 to 98kN of pressure down force, and that portion the lining will be carbonized by frictional heat, causing damage to the strip.
4. The roll surface is easily cut by the strip edge.
5. The thickness of the rubber layer is about 25mm. Therefore the usable life is very short.
6. The rubber covering is prepared by hand, causing a variation in quality.

Our newly developed roll

66D NON-TEX rolls are made from new materials which are non-woven fabrics. Therefore, unlike rubber covered rolls, no damage occurs on the roll surface.

66D NON-TEX ROLL surface consists of fabric material that a higher coefficient of friction than rubber covered rolls (4 times than rubber). The shearing stress (11,760N/cm²) of this roll is also much higher.

Since the roll core and the non-woven material are mechanically assembled and fabricated, such damage will not occur.

No such damage occurs because of the high shearing stress. The occurrence of damage caused by the strip edge is very rare.

The long wearing feature of this material is 3 to 4 times that of rubber covering.

Our covering is mechanically fabricated; there is no fluctuation in the quality and the hardness is consistent and easily adjusted.

Oil-Cut effect of 66D NON-TEX-ROLL

66D NON-TEX ROLL are made of special non-woven fabric and roll core and the disc of these fabrics are assembled and fabricated.

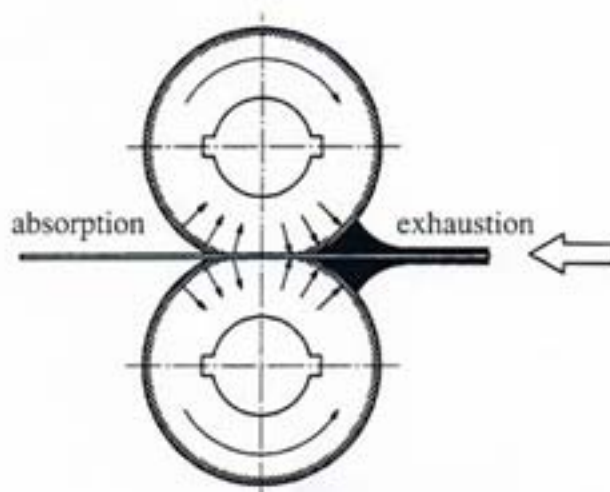
These rolls have high capilarity so the ability of absorption or exhaustion are increased in a higher level and as a result, these rolls are excellent in wringing or oil-cut effect.

In order to get the above effect, working operation is necessitated of suitable linear pressure for adherence between these roll and strip or steel sheet.

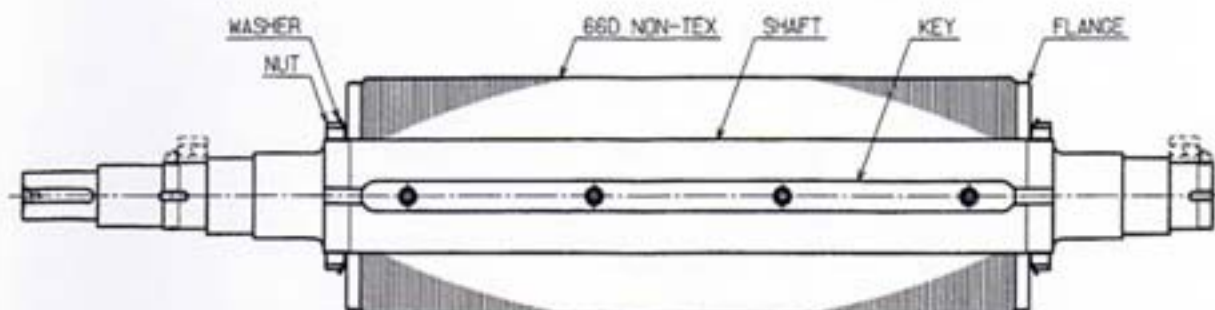
Suitable linear pressure :

less than ϕ 200 : 59~78N/cm(6~8kgf/cm)

more than ϕ 200 : 98~118N/cm(10~12kgf/cm)



Structure of 66D NON-TEX-ROLL (Squeegee/Wringer roll)



Oil-cut effects with linear pressure and line speed

Test-roll : Material : 66D NON-TEX PC-67, Hardness : 85°

Roll-size : ϕ 200×1,200 horizontal.

| Linear-Pressure | Unit | Line-Speed | | | | |
|----------------------------|------------------|------------|----------|----------|----------|---------|
| | | 480m/min | 360m/min | 240m/min | 120m/min | 60m/min |
| 49.0 N/cm (5.0kgf/cm) | g/m ² | 8.10 | 5.94 | 5.00 | 2.61 | 1.72 |
| 73.5 N/cm (7.5kgf/cm) | g/m ² | 6.84 | 5.41 | 4.66 | 2.34 | 1.60 |
| 98.0 N/cm (10.0kgf/cm) | g/m ² | 6.12 | 4.86 | 4.29 | 1.98 | 1.31 |
| 122.5 N/cm (12.5kgf/cm) | g/m ² | 4.95 | 4.50 | 3.69 | 1.62 | 1.05 |
| 147.0 N/cm (15.0kgf/cm) | g/m ² | 4.05 | 3.87 | 3.06 | 1.35 | 0.92 |
| 171.5 N/cm (17.5kgf/cm) | g/m ² | 3.60 | 3.33 | 2.71 | 1.13 | 0.70 |
| 196.0 N/cm (20.0kgf/cm) | g/m ² | 3.42 | 3.15 | 2.34 | 1.08 | 0.67 |

*Oil : 4.1mm²/s(4.1cst)/density=0.81 at 25°C

Above figure shows the amount of remained oil on the surface of steel strip.

Water-Wringer effects with linear pressure and line speed

Test-roll : Material : 66D NON-TEX PC-67, Hardness : 85°

Roll-size : ϕ 200×1,200 horizontal.

| Linear-Pressure | Unit | Line-Speed | | | | |
|----------------------------|------------------|------------|----------|----------|---------|---------|
| | | 300m/min | 180m/min | 120m/min | 60m/min | 30m/min |
| 49.0 N/cm (5.0kgf/cm) | g/m ² | 0.747 | 0.643 | 0.619 | 0.594 | 0.572 |
| 73.5 N/cm (7.5kgf/cm) | g/m ² | 0.620 | 0.506 | 0.440 | 0.391 | 0.361 |
| 98.0 N/cm (10.0kgf/cm) | g/m ² | 0.495 | 0.378 | 0.302 | 0.244 | 0.211 |
| 122.5 N/cm (12.5kgf/cm) | g/m ² | 0.413 | 0.316 | 0.215 | 0.153 | 0.119 |
| 147.0 N/cm (15.0kgf/cm) | g/m ² | 0.329 | 0.230 | 0.180 | 0.135 | 0.111 |
| 171.5 N/cm (17.5kgf/cm) | g/m ² | 0.270 | 0.189 | 0.162 | 0.130 | 0.109 |
| 196.0 N/cm (20.0kgf/cm) | g/m ² | 0.243 | 0.180 | 0.140 | 0.108 | 0.099 |

*Above figure shows the amount of remained oil on the surface of steel strip.

Typical example for practical use.

| Common Name | Designation of line | Designation of roll |
|-------------|---|---|
| HFL | Hot Finising Line | Oiler roll. |
| HCL | Hot Cutting Line | Coating roll. |
| HSL | Hot Skinpass Line | Table roll, Oiling roll. |
| CPL | Continuous Picking Line | Wringer roll, Oiling roll. |
| APL | Annealing Pickling Line | Support roll, Pinch roll, Snubber roll, Deflector roll, Wringer roll. |
| CTM | Cold Tandem Mill | Coolant Header roll, Ironing roll. |
| ZM | Sendzimer Mill | Wiper roll. |
| SPM | Skinpass Mill / Temper Mill | Oiling roll, Wiper roll. |
| CM | Cold Mill | Bridle roll. |
| ECL | Electrolytic Cleaning Line | Alkali & Water Wringer roll, Bridle roll, Snubber roll, Pinch roll. |
| CAL | Continuous Annealing Line | Wringer roll, Bridle roll. |
| CAPL | Continuous Annealing & Processing roll | Snubber roll, Alkali Wringer roll, Bridle roll, Rinse Wringer roll, Deflector roll. |
| BAL | Bright Annealing Line | Wringer roll, Deflector roll. |
| RCL | Recoilomg Line (RW=Rewinder) | Oiling roll, Pinch roll, Bridle roll, Snubber roll, Deflector roll. |
| FSL | Flying Shear Line | Oiling roll, Pinch roll, Feed roll. |
| HSL | Hold Shear Line | Oiling roll, Pinch roll, Feed roll. |
| CGL | Continuous Galvanizing Line | Oiling roll, Bridle roll, Wringer roll, Snubber roll. |
| EGL | Electrolytic Galvanizing Line | Dam roll, Back-up roll, Bridle roll, Alkali & Acid Wringer roll. |
| TLL | Tension Leveling Line | Bridle roll, Deflector roll, Pinch roll, Wringer roll. |
| CCL | Color Coating Line | Bridle roll, Wringer roll. |
| LCL | Lead Coating Line | Bridle roll. |
| B/L | Blanking Line | Pinch roll, Wringer roll, Coating roll. |
| SF | Sheet Feeder Line | Pinch roll, Oil-cut roll, Feeder roll. |



Global network for 66D NON-TEX-ROLL

66D NON-TEX-ROLL has a big reputation and has been used extensively for many type of application in the field of iron manufacture, non-ferrous metallic manufacture, steel manufacture, aluminum manufacture, brass or copper manufacture and automobile industries.

Our licensees are as follows.

USA

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EU

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Dierath 31 D-42779 Leichlingen GERMANY

Tel : 2175-5005 Fax : 2175-5091

KOREA

Korea Toho Ltd.

1172 Kukdang-Ri Kandang-myon Kyungjug-Kun Kyungsangbuk-do KOREA

Tel : 54-762-8252 Fax : 54-762-8225

Handling procedures of 66D NON-TEX-ROLL

- 1 Durability would be drastically decreased under the condition of distorted roll. Careful attention to pressure mechanism, driving procedure and horizontal direction of shaft are required at the time of installation.
- 2 Direct contact with wire rope and hook of forklift is prohibited when lifting up the time of installation.
- 3 Carefully check whether there is damage or roughness on the surface before replacement. There might be some change of quality caused by long period of storage.
- 4 Avoid excessive load. The recommended load for typical roll having more than ϕ 200 is using under 98~118N/cm (10~12kgf/cm) linear pressure.
*Grade of OR-210 is using under 49N/cm (5kgf/cm) linear pressure.
- 5 Static electricity might be generated because of high molecule fiber which is the main ingredient.
- 6 Take the following procedure to have better uniformity and performance for oil cut roll application.
- 7 Use the designated wooden box or bolster during transportation. Also use the bolster for storage not laying on the ground.
- 8 Avoid leaving roll under some pressure and load. Roll might be distorted and this causes vibration and poor oil cut performance.