



Easy Maintenance and Long Life Metallic Wires for Carding Machines

7th November 2019

Kanai Juyo Kogyo Co., Ltd.
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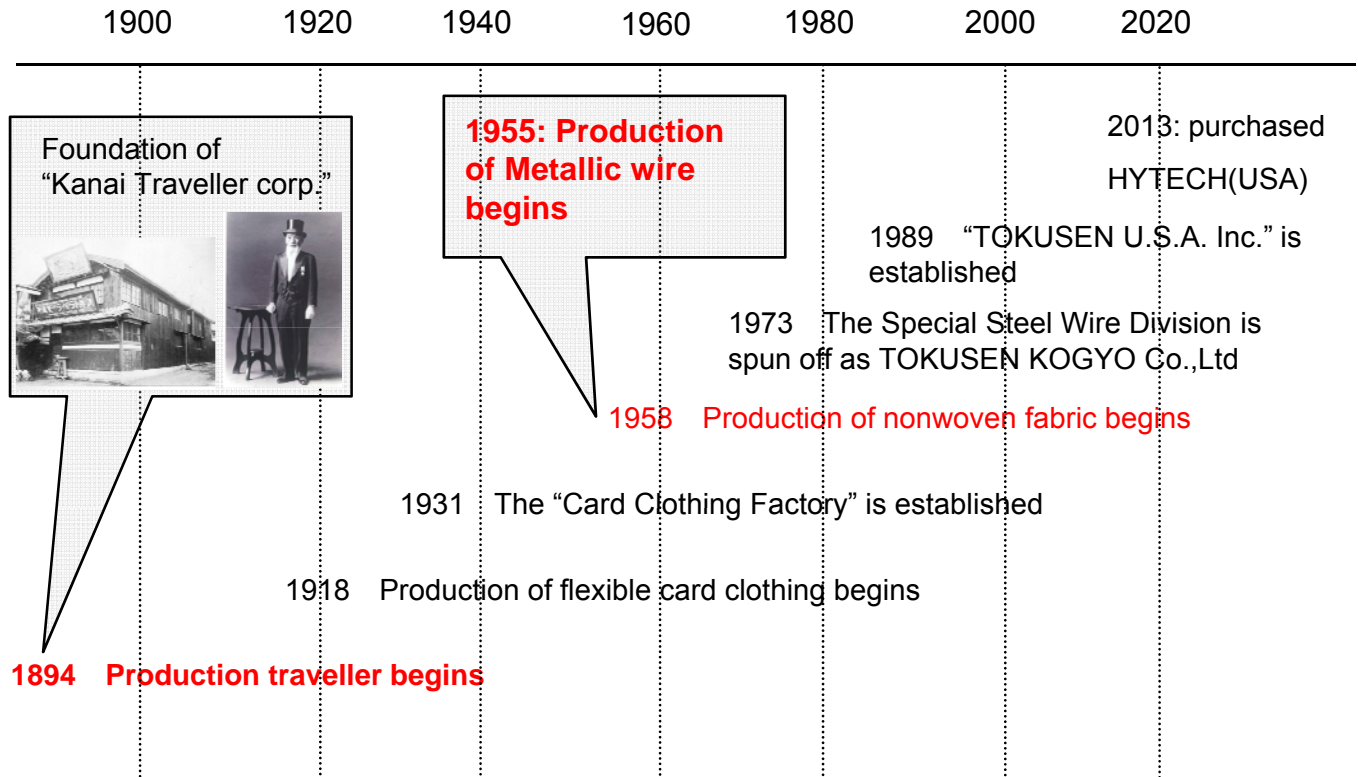
2. Metallic Wire

- ✓ Wire Manufacturing process
- ✓ Type & Function of Carding Machine

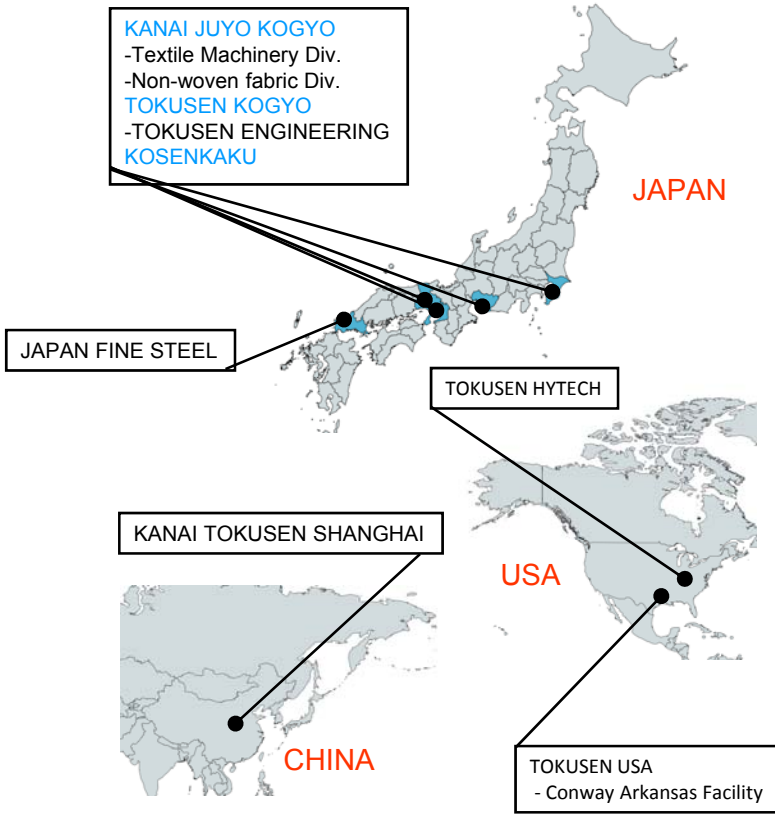
3. Demands from Customers

- ✓ Production Efficiency
- ✓ Easy Maintenance
- ✓ Long life Metallic Wire

History

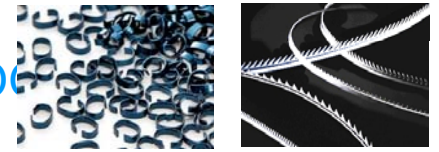


Kanai Group



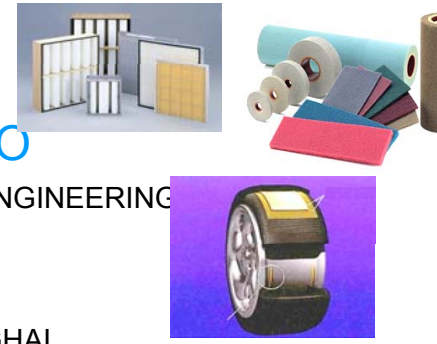
KANAI JUYO KOGYO

Textile Machinery Div.
Non-woven Fabric Div.

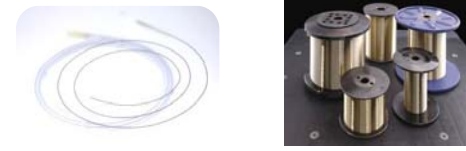


TOKUSEN KOGYO

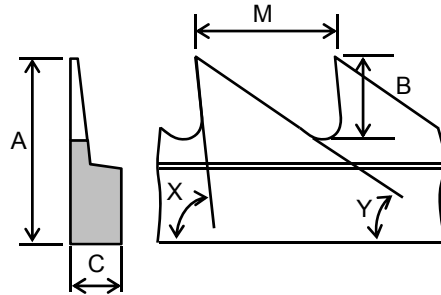
TOKUSEN TOKUSEN ENGINEERING
TOKUSEN USA
TOKUSEN HYTECH
KANAI TOKUSEN SHANGHAI
JAPAN FINE STEEL



KOSENKAKU



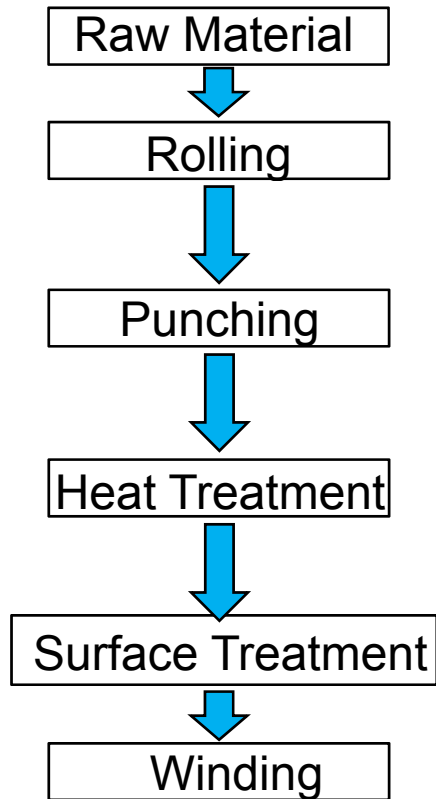
What's Metallic Wire ?



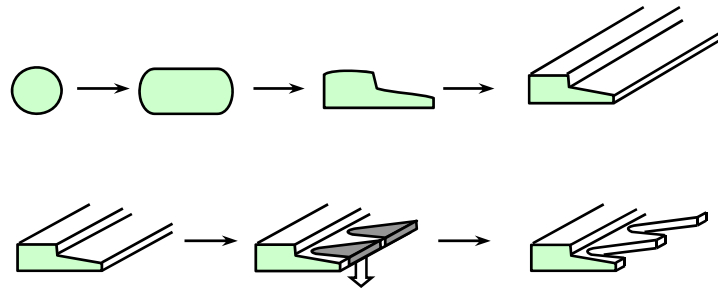
- A: Height
- B: Depth of teeth
- C: Thickness
- X: Working Angle
- Y: Back Angle
- M :Teeth (/25.4mm)



Manufacturing Process (Metallic wire)



● Supply from M/s.TOKUSEN KOGYO



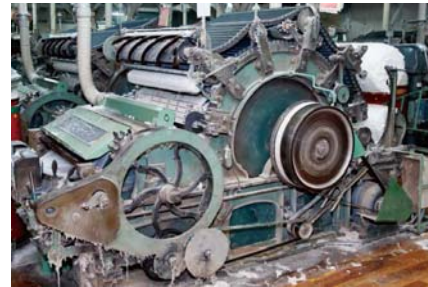
Anneal → Hardening → Tempering

LH, EP, SF, SF-EP, FC

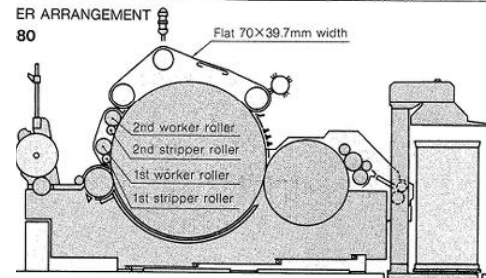
(Name of Kanai's surface treatments)

Type of Carding Machines

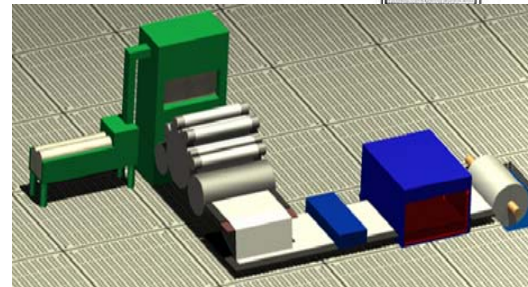
- ✓ Flat Carding Machine
= Cotton, Synthetic fiber
Fiber Length 25 ~ 38mm



- ✓ Combination Carding Machine
= Synthetic fiber
Fiber Length more than 50mm

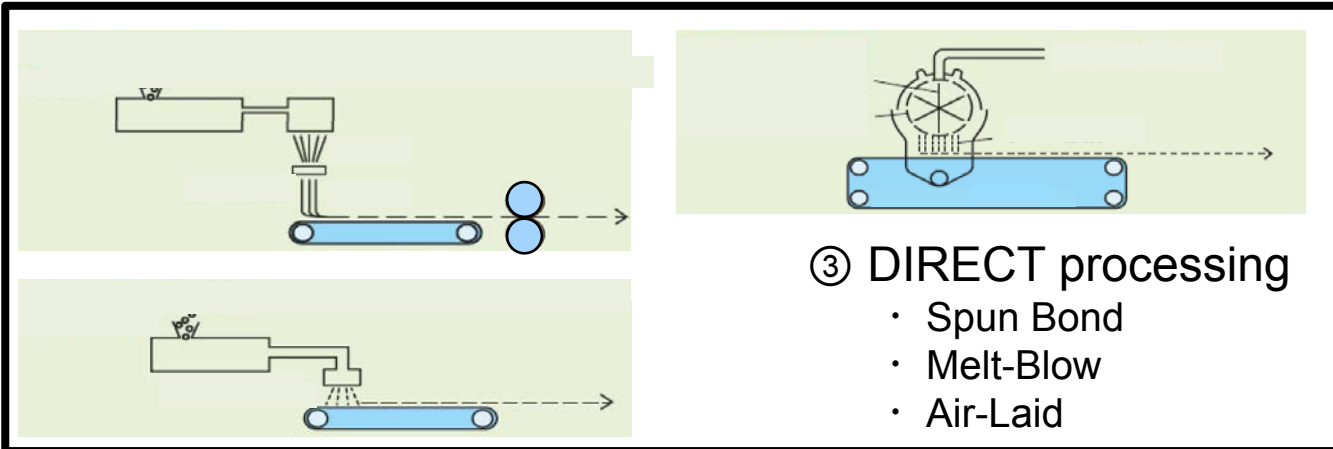
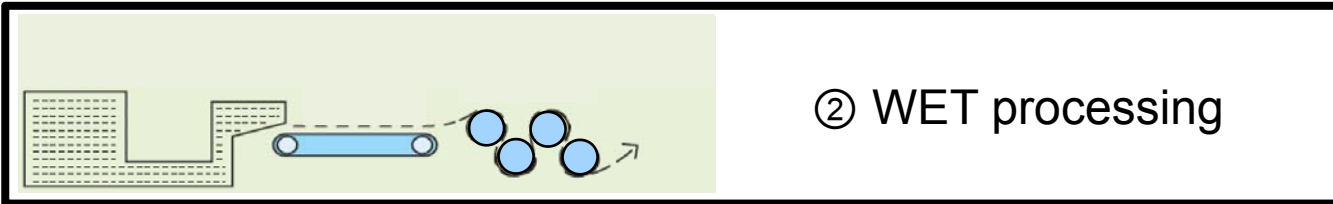
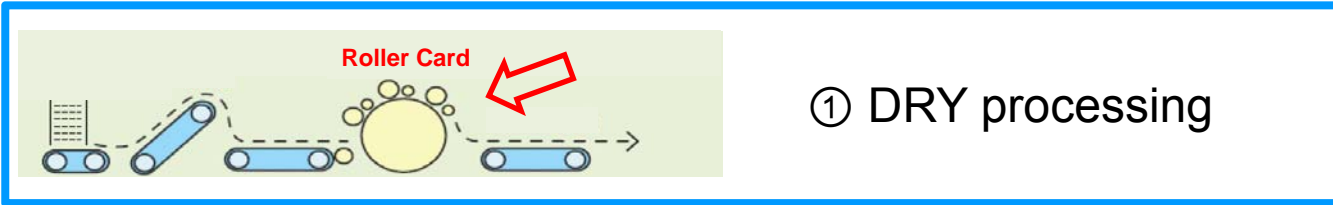


- ✓ Roller Carding Machine
= Nonwoven products
Fiber Length 15 ~ 100mm



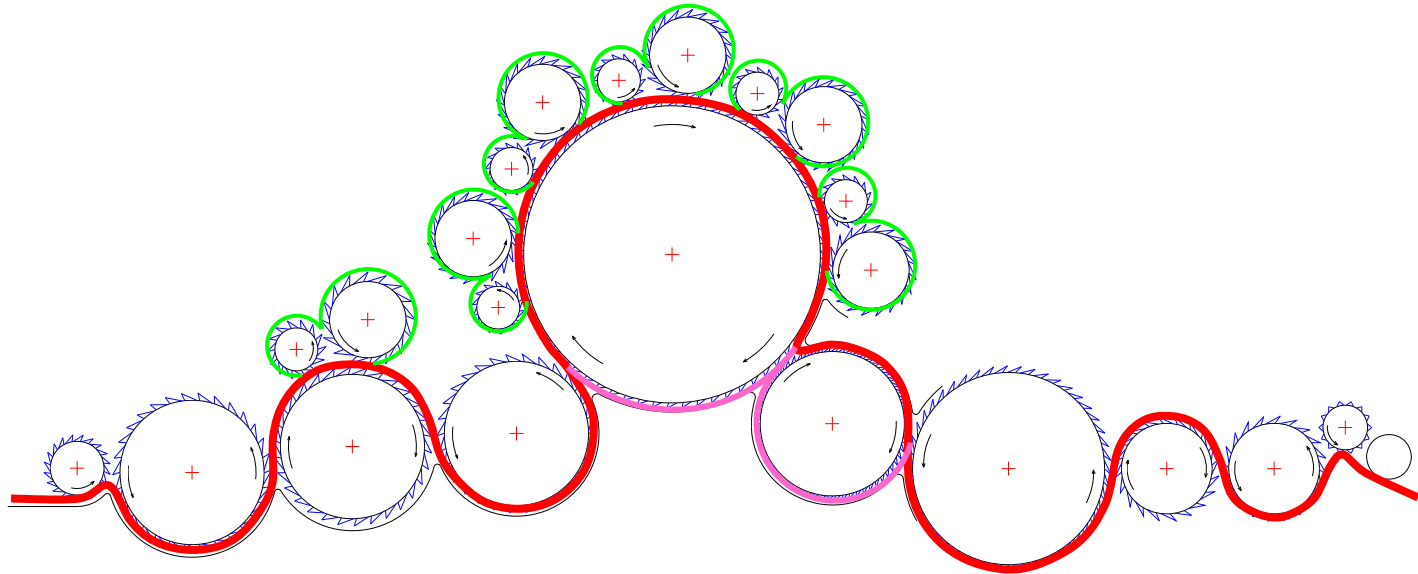
Web Making Processes

* SOURCE: <https://www.anna.gr.jp/>(ANNA)



Function of Roller Carding Machine

- ✓ Transfer the fiber from roller to roller
- ✓ Opens fiber mass
- ✓ Make the fiber to uniformed or random direction



Demands from Customers

- ✓ Production Efficiency
 - ➡ Surface Treatment
- ✓ Easy Maintenance
 - ➡ Surface Treatment
- ✓ Long-Life Metallic Wire
 - ➡ Raw Material & Heat Treatment

Demands from Customers

Surface Treatments

- LH Treatment
Free Oxide Scale (Standard Treatment)
- EP Treatment
The Galvanize plating.
- SF Treatment
Free Oxide Scale + Smooth Surface Finish.
- SF-EP Treatment
Combination of “SF” and “EP”.



Demands from Customers

Production efficiency ①

⇒ Quick operation after mounting Wire

- Problem ; Dirty web from New Wire.
- Influence ; Production & raw material loss.
- Factor ; Oxide Scale created by the heat treatment.



❖ Solution ; Apply Surface Treatment. (LH, EP, SF, SF-EP, FC)



With Oxide Scale



Without Oxide Scale(SF)

Demands from Customers

Production efficiency ②

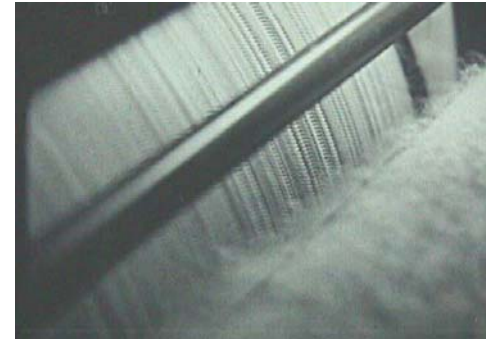
⇒ Productivity improvement

- Problem ; Fiber Loading, Nep creation.
- Influence ; Bad quality web & Production loss
- Factor ; Higher friction by Fine Denier / Multi Function fiber.
Inappropriate wire specification.

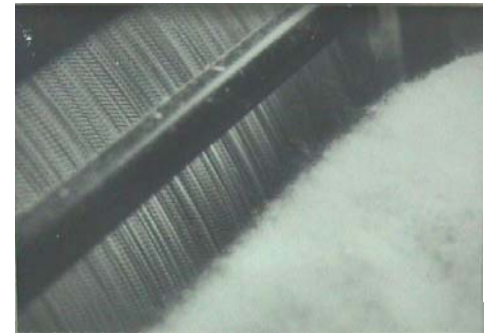


❖ Solution : Apply surface treatment (LH、 EP、 SF、 SF-EP、 FC)

Selection of suitable Metallic wire specification.



Fiber Loading



Normal Condition

Demands from Customers

Easy Maintenance

⇒ Saving production loss & consistent quality

- Problem ; Oil accumulation on the Metallic wire.
- Influence ; Deterioration in quality, productivity & maintenance time.
- Factor ; Fiber with special oil and low melting point fiber.

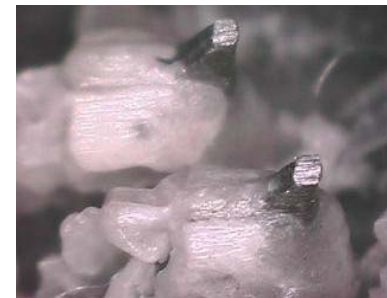


✧ Solution : Apply surface treatment.

Smoother surface wire (FC = F-Coat)



Transporter



Cylinder

Demands from Customers

F-coat[®] (Coated Metallic wire)

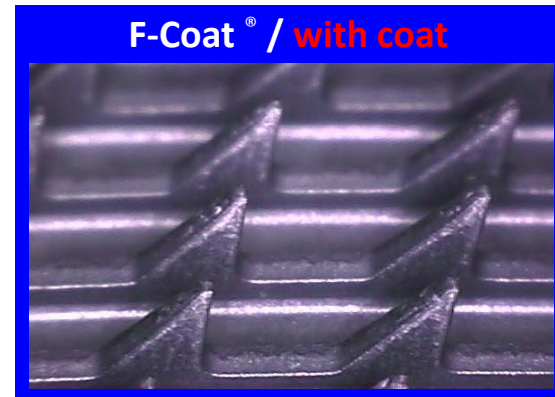
Example of effect > Comparison of Chemical accumulation

Period of use : 3 months

Fiber : PP, PET, Rayon / Low melting point Fiber

Roller : Stripper

Wire Type : ZK080RD



Demands from Customers

Long Service Life

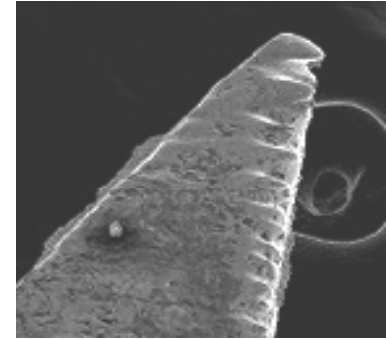
⇒ Consistent quality for long period.
Extension of replacement cycle.

- Problem ; Short service life from wire wear out.
- Influence ; Inconsistent quality, productivity deterioration,
Higher maintenance cost.
- Factor ; High production, Fine denier fiber / Dyed fiber.

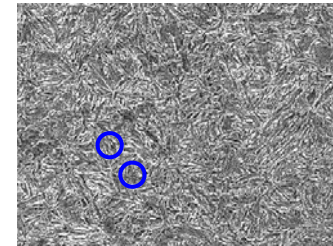


◇ Solution; Better heat treatment (ES)

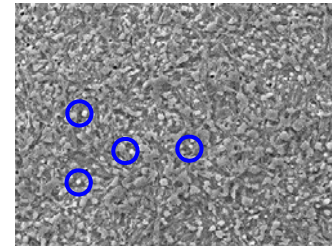
Special grade raw material (NS)



Example: worn out wire
(about 8,200hr.)



Metal Structure / ES



Metal Structure / NS

Demands from Customers

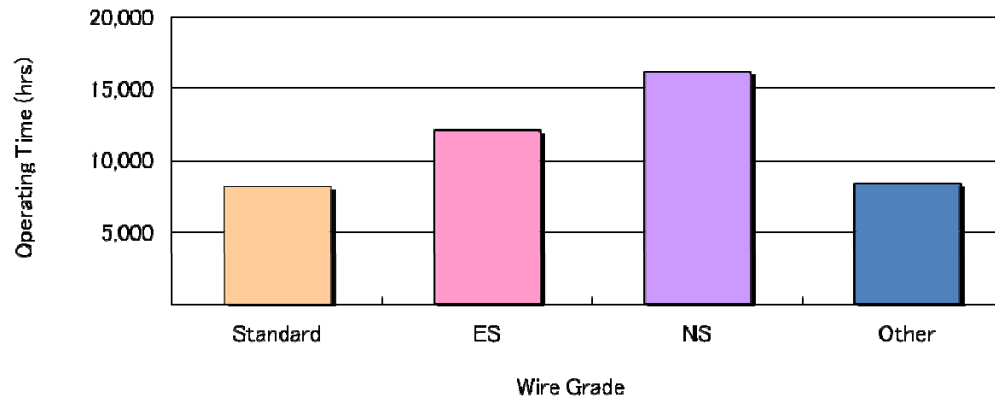
Ex > Comparison on Service life

Fiber ; Polyester 1.7dtex~3.3dtex × 51mm (Dyed fiber blended)

Roller ; Cylinder

Wire Grade ; Standard, ES, NS

Production ; 50kg/hr/m





Thank You!