

**HETUDA TEXTILE MAKING PLANT.,
NEPAL**



®

PROPOSAL

**FOR THE SUPPLY & RECONSTRUCTION
OF HETUDA TEXTILE MAKING PLANT**

CMEC International Engineering Co. Ltd.

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BEIJING CHINA



RECONSTRUCTION PROJECT FOR HETUDA TEXTILE PLANT

For the invitation of Mr. Brij Gopal Innani – Chairman of Garment Association, we arrived at Kathmandu on January 26, 2001, and went to Hetuda textile plant for technical survey on January 30, 2001. According to the introduction of local plant, the plant was built by Chinese government in 1978. It has been in operation well within 2 years after the Chinese experts left, then it did not perform well during the past twenty years, the ratio of operation is only 50%. With the low production level, the quality of production could not meet the third class quality standard of China. The main reason for this situation is because of low management level, aging of the machinery, performance character not good.

For the requirement of client to the plant - “formal reconstruction for textile mill and key improvement for its dyeing and printing”, we make the following reconstruction plan for your reference:

I. Reconstruction for Textile Technology Equipment

The recent plant still keeps the equipment aided by China in 1978, the spinning machine is A-head type, the type of loom is 1515 (size: 56 inches), The products made by the plant: 30x30 delaine, 18x18 tang, 18x18 damask and 10x10 coarse were the same type with the type of 1978 and they are not changed. A serious spinning machine was good in 1970's, but since technology development and highly market requirement for cotton yarn, the disadvantage of A serious spinning machine is appeared now. In China, the advanced FA-head type of spinning machine is instead of A-head type of spinning machine. For the requirement which annual production capacity is 3.5 million meters of 108x58, 128x60 damask and improving the quality of tang. We forward the following reconstruction plan in the original main workshop:

1, Spinning Section

1.1 Cotton cleaning procedure: For cotton mixing well and its little catching, we use A002D cotton catching machine instead of original A002A machine, or replace the old catcher and add wall plate of cotton table on basis of A002A machine; To adapt non-cotton products processing, the 1st A036 porcupine cotton separator of each set of cotton cleaning machine was changed to nose type cotton separator. 2nd unit was changed to needle combing separator. To increase the effort of dedust and cotton mixing, improving the evenness of cotton yarn bar, we change head of A076A to A076E head. Cotton condensing equipment used for cotton cleaning is not convenient for maintenance, with disadvantage of small blowing, airflow block and not easy for hair debug, so it shall be changed to A045B cotton condensing equipment; Dust catcher A171-21 is inefficient, it was fallen into disuse in China, no spare parts, it shall be changed to JYFO alveolate dust catcher.

1.2 Cotton Combing Section: The start and transmission of the original equipment was not well, it affected the quality of cotton net and made the head bar and coil arrangement not well, so it shall



make a reconstruction for the transmission and head bar and coil. Meanwhile, the advanced Graff needle clothes to make the better quality can also replace it. The dust catcher system for combing section is the same with cotton cleaning section, JYFO alveolate dust catcher is recommended to use.

- 1.3 Drawing section: The pull & extend type of original drawing machine A272 is three-up-four-down curve drawing, it is not good for the fiber control shout hair discharge, it is easy to make yarn flaw. So the plan will use FA315 drawing machine instead of A272A drawing machine, It use three-up-three-down press stick drawing form for which the fiber can be well controlled. The drawing method is also called as “dedust press stick”, it can avoid the yarn flaw caused by dust mound of press stick
- 1.4 Coarse yarn processing section: the 7 sets of original coarse yarn processing machine use drawing form of three-up-four-down, it can not meet the requirement of high quality for yarn production. So this time, we will eliminate them all, and use 7 sets of FA415A Suspended-flyer Roving Frame (108 spindles/set) instead of them. The machine is new type of suspended-spindle coarse yarn processing machine, it has the advantages of high production capacity, stable quality, and perfect function. It adopts the drawing type of three-up-three-down double belt drawing.
- 1.5 Spun yarn processing section: We will make the reconstruction for the part of drawing, transmission, coarse yarn frame, the frame is changed to YJ2-142, transmission is changed by oblique gear and the coarse yarn frame is replace by suspended spindles.
After changing weaving machine with 96 sets of sword rod weaving machine, the consumption of direct weft yarn has been reduced; the consumption of tube yarn has been increased, the actual requirement need to change 5 sets of weft yarn weaving machine with warp yarn weaving machine.
- 1.6 Winder processing section: Since consumption of tube yarn is increased after 96 sets sword rod weaving machine arrived, two new GA015 Winders are needed. Meanwhile, on the original winder, it need to add the fold proof equipment, electric yarn cleaner, air connector and circuit fan, it is effort to reduce the yarn defect, reach the purpose of producing high quality and no yarn defect.
2. Weaving Section
Renew a no shuttle & wide-width weaving production line, meanwhile, make a good reconstruction for the remaining.
 - 2.1 Warping section: Eliminating a set of 1452A-180 type warping machine, and replacing a set of G1201-180 high speed warping machine, it can equip well with renewed sizing machine and meet the production requirement of shuttleless loom.
We make a parallel pressure for the remaining 2 sets of warping machine for the tension of yarn equably.
 - 2.2 Sizing section: Eliminating a set of G142-180 Sizing machine, and replacing a set of wide-width & double-trough sizing machine, can meet the requirement of width: 0 – 190cm rapier loom.
Add 2 sets of high-speed size mixing bucket, can meet the sizing requirement for Dacron & cotton.
 - 2.3 Reeding machine: Replacing 6 sets of G177-180 reeding machine.



2.4 Weaving section: Eliminating 198 sets of 1515-56" shuttle loom, and renewing them with 96 sets of reeding width: 190cm rapier loom, it can accommodate weaving of twill products 20x16, 128x60, 20x20 and 108x58.

Making part reconstruction for remaining 290 sets of shuttle machine:

2.4.1 Equipping central weft cutting equipment (like chicken pecking at rice).

2.4.2 For 120 sets of shuttle machine, we add outboard warping feed equipment, rubber guide roller for cotton coil, make more spring tension of roller bracket, increase numbers of reed nose and replace quick-wear part to accommodate the weaving of compact textile.

2.5 Reorganizing Section: Eliminating 3 sets of G312-160 Inspecting machine and a G351-160 Folding machine, Renew 3 sets of GA801-180 Inspecting machine and a GA841-180 Folding machine. We add a big baling press to meet the requirement of bolt clothes storage.

2.6 Inspecting instrument: For analyzing and get fluctuating situation of product quality at any time, and making the amendment and advancing the technology ceaseless, we add a homogenous degree instrument for Wust bar and tension instrument for single yarn.

2.7 Others: Relevant equipment and part for the machine reconstruction:

2.7.1 Card clothing, cotton bar bucket, rubber roller, rubber ring, spindle, rings, yarn pipe.

2.7.2 Thread, frame and shuttle.

3. The schedule of renewed and reconstruction machine of textile:

| Item No. | Description | Content for renew and reconstruction | Qty (Set) | Remark |
|----------|---------------------------------|---|-----------|--------|
| 1 | A002A Automatic cotton catcher | a. Change beaters pf catcher b. Reform transmission part c. Add wallboards | 4 | |
| 2 | A036 Porcupine cotton separator | a. Change nose beater for cotton spinning b. Change with carding-pin beater c. Add safety equipment | 4 | |
| 3 | A034 6-roller cleaner | Renew with single axle-flow cleaner | 2 | |
| 4 | | Add FA022 multi cotton mixer | 2 | |
| 5 | A076A Single beater lapper | Reform head part | 4 | |
| 6 | A041 Cotton condenser | Renew with A045B Condenser | 4 | |
| 7 | A171-21 Dust filter | Renew with JYFO Honeycomb dust cleaner | | |
| 8 | A186-600 Carding machine | Reform a. tap part, b. transmission part c. Card clothing | 30 | |
| 9 | A171-21 Dust filter | Renew with JYFO Honeycomb dust cleaner | 2 | |
| 10 | A272 Drawing frame | Renew with FA315 machine | | |
| 11 | A453 Roving frame | Renew with FA415A Suspended-flyer roving frame | | |
| 12 | A512 Spinning frame | Reform a. drawing part, b. yarn c. Card clothing | | |



| | | | | | |
|----|---|--|--|--|----------------------------------|
| 13 | 1332M Winder frame | | a. Add fold proof equipment, electric yarn cleaner, air twiner, and mobile fan. b. Add GA015 Winder frame | | Include Air compressor |
| 14 | 1452A-180 Warping machine | | a. Reform pressure part b. Renew with G1201 Warping machine | | |
| 15 | G142-180 Sizing machine | | Renew with wide width, double through sizing machine. | | |
| 16 | G921 Size mixing bucket | | Replace with High-speed size mixing bucket | | |
| 17 | G177-160 Automatic reeding machine | | Replace with G177-180 Automatic reeding machine | | |
| 18 | 1515-56" Automatic shuttle changing weaving machine | | a. Reform warp feed part, crimping part. b. Equipped central weft breaking probe. c. Renew with width of 190cm rapier loom | | Eliminate 198 sets Shuttle frame |
| 19 | G312-160 Cloth inspecting machine | | Renew GA801-180 Cloth inspecting machine | | |
| 20 | G312-160 Cloth inspecting machine | | Renew with GA841-180 Folding machine | | |
| 21 | | | Add A761 Hydraulic balling press | | |

4 Plane layout of textile plant sees: Drawing 200108-02

II. Reform scheme for dyeing and printing equipment

The original dyeing and printing plant use 71 serious dyeing and printing equipment with 56" weaving machine form 160 series production line. The design capacity for pure cotton is 100,000,000 meters/year, the variety content: white cloth 20%, dyed cloth 50% and printed cloth 30%. According to the survey, the machines in plant have not been advanced and reformed in last 20 years. Now the production line is old, it cannot produce wide width blending fabric. It is important for the to add a new line to produce wide width and accommodate production of Dacron & cotton blending fabric.

For original line, we must make a relevant repair and reformation work, employing senior technicians, use advanced dyeing materials and increase technology to make better quality cloths.

Summing up, we decide the reforming scheme for Hetuda textile plant: Reforming the original 160 series pure cotton production line, add a new wide width 180 series production line for dyeing & printing cotton and Dacron blending fabric.

The products made from 180 series production line shall meet the market requirement of USA and Europe Union for 108x58, 128x60 pure cotton, Dacron blending fabric. The equipment and technology for this plant are extensive use in China.

The detailed technology process is as follows:

Pure cotton series:



Singeing → Desizing → Potting → Bleach → Mercerizing → Dyeing → Drying → Sizing & Stentering → Preshrinking → Coil checking → Packing

Dacron/Cotton series:

Singeing → Sizing removing → Potting → Bleach → Mercerizing → Setting → Dyeing → Drying → Sizing & Stentering → Preshrinking → Coil checking → Packing

Detailed equipment decision:

1. Singeing: The key technology for singeing machine is flame technology. Now, Chinese flame treatment has renewed for several generation, it is at advanced level in the world. The new singeing machine adopt XH series high-efficiency mixed-rotating flame, the flame temperature and gasoline consumption is at advanced international level. The technology for fire extinguisher, dust cleaner, center control equipment and fire amplitude modulation have been advanced a lot before. It has automatic control system, it is easy operation, good adaptability, safety and beautiful. According to the product requirement, the line equipped a set of Chinese air singeing machine.
2. Sizing removing, Potting and Bleach: The preparation treatment technology is important in whole dyeing finishing line. As the textile series is thicker, more sizing, ease fold, we use flat continuous sectional pretreatment technology and relevant equipment. The sizing removing process operated in crawler steamer; the potting process is in R-Box; the bleach process is in caterpillar steamer. In crawler steamer, the textile are piled loose on crawler plate, the steam is easy input from circular hole of crawler plate to textile, preventing air-dry, scaled or crease. For pile loose, the head of textile is less pressed and easy drawn from box during cloth output, preventing crease occurred. The upper half part of R-box composite with straight guide roller in which cloth quantity is not big and two steam-spray pipe, it is same with plate steam box. The pile part of down half box is composite with roller with center hole and arc screen. The textile is folded between their layers. With the rotating and putting forward, the down half part of roller with center hole under the axis is chemical auxiliary solution. It is heated and boiled by indirect steam pipe, textile is treated in boiled solution. The Chinese equipment for sizing removing, potting and bleach pretreatment is with high efficiency, it is good repetitive performance and the price is favorable.
3. Mercerizing: The effort of mercerizing influenced dyeing directly for the feature of processing textile. We use single layer clip-chain mercerizing range. The new type of the single layer clip-chain mercerizing range assimilate the advantage of advanced foreign equipment, renew the automatic control equipment which is tested for the technical data online. It solves the problem of self-control system for alkaline concentration; add a display instrument for textile expansion inspection and tension inspection. Electric drawing sys uses AC frequency conversion governing system, add alkaline filter for mercerizing of loose pile and preventing off-clip-chain. T meet the capacity: 10 million meters per year, we use a single layer clip-chain mercerizing range.
4. Dyeing: for specific market requirement: more types, less lots, quick delivery and production for pure cotton and Dacron & cotton blending products, we use normal pressure and temperature jigger and high pressure and temperature jigger. The new type of jigger improves a lot than old one at tension, automatic control for time, temperature, pressure, and programmed performance. According to the capacity, the plant needs 14 sets of normal pressure &



- temperature jigger and 3 sets of high pressure & temperature jiggers.
5. Forming: To ensure the dyeing quality, Dacron cotton products shall be formed before dyeing. Considering the original plant have no boiler, cheap electricity and not more power loss for Dacron cotton products dyeing, we use electrical heating method which is quick, low power lose and flexible reaction. The stentering guide system adopts new materials and construction, it work continuously under the condition of high temperature and high speed, it does not need to add lube, and it control chain tension automatically, the chain is heated expansion and cold shrinkage during temperature variations, and the tension of chain can kept no change. So the chain works under a static tension, and extend the life of lubricating thin-film, chain pin-jacket and pin-axle, the cordwood structure, circulating blower's simple structure makes great blowing. It is high efficiency for heat circulating blowing, easy maintenance and cleaning, high class for automatic control. So we use a set of six-unit stove and forming machine.
 6. Stentering: For finishing of pure cotton and Dacron cotton products, we add a rolling equipment at the head of the machine for various type of sizing rolling finishing like soft finishing, deflection finishing, insect-proof finishing and health protection finishing. We adopt a set of stenter.
 7. Preshrinking: Now the garment market is having more requirements for shrinkage and handle feeling. For the size stability of textile, the cloth must have preshrinking finishing. The compressive shrinking range contends the sections of cloth feeding, moisture feeding, steaming preheating, preshrinking with rubber carpet, wood carpet finishing and clothe falling. We use a set of compressive shrinking range, we use imported rubber of 65mm for the rubber carpet shrinking section.
 8. Cloth inspecting and packing: We use a set of cloth inspecting and folding machine and a set of packing machine.

Please see following abovementioned equipment list for 180 series dyeing finishing line:

| Item No. | Description | Quantity |
|----------|---|----------|
| 1 | Double face gas singeing rang CLMA003-200 | 1 |
| 2 | Desizing, scouring and bleaching range LMA043 | 1 |
| 3 | Single layer clip-chain mercerizing range LMH201C-180 | 1 |
| 4 | Heat setting machine LSR798-180 | 1 |
| 5 | Axle coiler and hoist MH141-180 | 1 |
| 6 | Normal temperature and pressure jigger M125A-180 | 1 |
| | High temperature and pressure jigger M141-180 | 1 |
| 7 | Water mill and dryer LMH101-180 | 1 |
| 8 | Hot air clip stenter LM734N-180 | 1 |
| 9 | Compressive shrinking range HLMA838-180 | 1 |
| 10 | Combined inspecting and folding machine LM882 | 1 |
| 11 | Hydraulic baling pressA752 | 1 |

For reasonable and smooth arrangement, we shall build a printing and dyeing workshop for the new wide-width printing & dyeing workshop for the new wide-width printing dyeing production line.



Please see attached 200108-03 Drawing.

Remark:

1. Considering products structure, technical difficulty and invest, the technical reconstruction plan of production line is for dyeing products. If the client needs to produce printing products in future when the condition is ripe. We'd like to supply a new printing production line.
2. If the new wide-width cotton and Dacron cotton production line operates in the same time with the original 160 series production line, the capacity for civil works, water, electricity, steam and gas is not enough. So the enterprise shall arrange well for production or increase more capacity during the développement.
3. The plant has no sewage process plant; the plant shall be built according to the requirement of environmental protection.

III The technical level and quality level after reconstruction

After the reconstruction work finishing, the technical level for weaving part can reach the current middle and high technical level of China. Dyeing part can reach the advance level of China. If the client can employ senior manager and technical engineer and experienced worker for important section, the quality of cotton yarn can meet 50% standard of Wooster Communiqué 97.

Please see the sample:

