

URANIUM CORPORATION OF INDIA LIMITED
JADUGUDA MINES

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Tender No.: PUR/2/22/8047/1210

Item: Drainage Belt for Horizontal Belt Filter.

Revised Technical Specification for Supply, replacement, installation, training, drilling, curbing, alignment, testing and commissioning of drainage belt for acidic/neutral Horizontal Belt Filter complete in all respect as per specifications & drawing attached.

SCOPE OF SUPPLY & WORK

A. Site Inspection:

1. The Tenderer may visit the site for factual assessment of the area earmarked for the installation / replacement of drainage belt for horizontal belt filter before submission of the offer so that space constraint, existing restrictions, obstructions ,limitations and site working conditions etc. can be understood before submission of offer. They make themselves fully conversant with the conditions of tendering, general conditions and Special conditions etc.
2. The Tenderer is advised to check the design, dimensions & specifications of drainage belt at site before submission of their offer.

B. Supply:

3. The drainage belt is the most important component of every filtration plant. Every single belt is designed and tailored to meet all the requirements related to the plant process data. So supplied Drainage belt shall be identical to existing one supplied by **FL Smidth/ VMix Mineral/ Tenova** suitable for Extractor Filter 3.2M 83.

Machine Group: EA14951M

Tag No: - 5FL-1A-E (HBF for acid leached slurry), 3FL-1A-C (for neutral slurry)

Job code: 04-2457(HBF-UCIL-INDIA)

4. Drainage belt to be procured through M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle) with submission of documentary evidence at the time of supply with each Belt. The transporter belt shall have a minimum thickness of 38 mm and shall be made of SBR with hardness of $60 \pm 5^\circ$ Shore A & shall have polyester carcass. The main transporter belt shall have facility to reduce friction while moving on the natural rubber lined belt support rollers / supports etc. Supply of two numbers (02nos.) endless drainage belts identical to existing for Horizontal belt filter (HBF) system –for neutral slurry filtration & for acid slurry filtration each having filtration area of 87.5 m² having specifications as below:

The drainage belt is most critical part of the filter. It shall be designed to carry the filter cloth, slurry and filter cake. It distributes the vacuum from the vacuum box in to the filtration area and transport the filtrate into the vacuum box. The drainage belt shall be grooved to provide maximum flow through the grooves with uniform vacuum distribution to form a uniform cake. The grooves are cut on automatic grooving equipment.

For excellent shear strength in the carcass for all loads, the drainage belt shall be factory spliced. After installation, the belt will be tensioned, run and stabilized over the vacuum pan. The belt is then trimmed on the edges to stringent requirements for belt straightness.

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The belt edge flanges shall uniformly support the cloth edges, form a good vacuum seal and shall provide excellent flex life. The flanges will deform as they travel around the pulleys, to seek a state of lowest stress.

The ends of each groove will be hand finished to a point 12 mm (0.5") from the base of each flange. This is to provide uniform drainage in the belt and eliminate the possibility of any wet edges on the filter cake.

The drainage holes are drilled in the centre of the belt through every other drainage "ridge" so as to maintain maximum strength of the belt through its centre. Each hole therefore drains two belt grooves. The edges of the holes are chamfered to maximize filtrate removal.

Before submission of offer bidders are requested to check the details physically and there will be no deviation.

Drainage Belt	SBR Elastomer covered
- Belt MOC	SBR
- Belt Width	3200 mm
- Belt Thickness (overall)	38 mm
- No. of ply	4
-Top Cover (mm)	20
- Bottom cover (mm)	6
- Hardness of cover	60 ± 5° shore A
- Carcass Material	Polyester
- Center/Edges	Carcass free
- Method of Bonding	Hot Vulcanizing
- Groove width	16 mm
- Groove depth (at edge)	16 mm
- Groove depth (at centre)	16 mm
- Hole Diameter at centre (mm)	18 mm
- Curb height	125 mm
- Method of bonding	Lateral Curbs (Straight Shape Design) with good flexibility and wrapping on head and tail pulleys, a good rebound to get back to the original shape (elasticity). Curbs will be fixed by cold (glueing)

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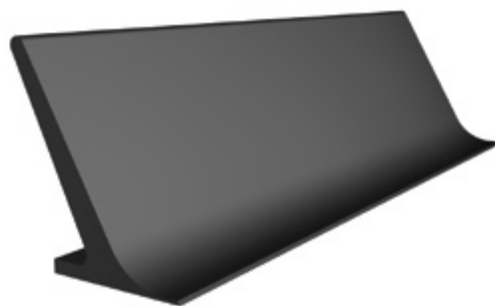
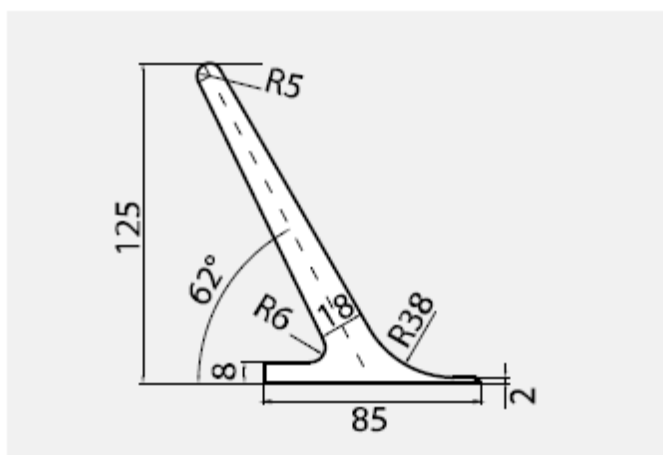
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5. Supply of two numbers of curbs (edge flanges) for each drainage belt identical to existing. Hence four (04) nos. curbs (i.e., two sets) will be required for two numbers drainage belts. This item also to be procured through M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle)

Only straight curbs are acceptable. Width of belt surface from top of one side of the curb to the top of other side of the curb is 3330 mm. This is to be maintained during bonding of curbs with drainage belt.



6. Supply of two sets of slide blocks as detailed below:

Sl. No.	Description (Yellow grade UHMWPE)	Qty. Required per set
01.	Slide blocks (long) for Acid/Neutral Belt Filters, Item No.:03A, Part No.: EA14676D...AC as per Drg. No.: UCT-2/MECH/BELT FILTER/05	30 Nos.
02.	Slide blocks (long) for Acid/Neutral Belt Filters, Item No.:03B, Part No.: EA14676D...AD as per Drg. No.: UCT-2/MECH/BELT FILTER/05	30 Nos.
03.	Seal Feed End & Seal Discharge End for Acid / Neutral Belt Filter, Item No.: 01, Part No.: EA14677C...C as per Drg. No.: UCT-2/MECH/BELT FILTER/06	03 Nos.
04.	Seal Feed End & Seal Discharge End for Acid / Neutral Belt Filter, Item No.: 02, Part No.: EA14677C...A as per Drg. No.: UCT-2/MECH/BELT FILTER/06	03 Nos.
05.	Slide blocks (Short) for Acid/ Neutral Belt Filters, Item No.:04A, Part No.: EA14676D...H as per Drg. No.: UCT-2/MECH/BELT FILTER/23	03 Nos.
06.	Slide blocks (Short) for Acid/ Neutral Belt Filters, Item No.:04B, Part No.: EA14676D...J as per Drg. No.: UCT-2/MECH/BELT FILTER/23	03 Nos.
07.	Take-up block Vacuum Pan for Acid/ Neutral Belt Filters, Item No.:05, Part No.: EA14677C...F as per Drg. No.: UCT-2/MECH/BELT FILTER/07	12 Nos.

Drawings for above items enclosed with NIT.

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7. Supply of SS-316 fasteners for reassembly of air deck assembly, vacuum pan etc. during replacement of drainage belt.
8. Supply of other consumables like silicon sealant, packing strips, packing rubber etc.
9. Supply of SS 316 Plates of quantity 10 Nos. each of size: 3000 x 1250 x 4 mm.
10. Supply of 2 sets (4nos.) of wear belts which will be installed with drainage belts for satisfactory performance.

<u>SPECIFICATION FOR HBF WEAR BELT</u>	
Duty :	To work as vacuum seal belt for horizontal belt filter under 600 mm Hg vacuum. Top surface will be sealing surface and bottom surface will slide on UHMWPE slide blocks. Plain water will be lubricant.
Equipment :	Horizontal Belt Filter Size 3.2 mtr x 83 mtr.
Manufacturer Code :	BYC 2040151
Wear Belt Part No. :	EA14948 D
Type of Belt :	Endless
Total Belt Length :	56.9 meter
Belt width :	55 mm
Total Belt Thickness :	8 mm (+0.00, -0.5 mm)
No. of Ply :	3 (Cotton carcass)
Top Cover Surface :	Rubber 3 mm thick
Bottom Surface :	Carcass
Top Surface Hardness :	55 ± 5° Shore A
Elongation :	½ % Max

C. Supervision, installation & commissioning of the drainage belt

11. The drainage belt covered under this offer shall come in safe for shipment condition from M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle) and any damage, misalignment or losses may occur in transit shall be in bidder's scope.

12. Safely unloading and handling of material at site / from stores to erection site shall be in bidder's scope.

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13. The party should have pool of experienced engineers, supervisors and technicians. Persons deputed at site should be capable to take-up the job assigned to them without need of any sort of training.

The drainage belt along with other items after receipt and acceptance shall be erected and commissioned as per the agreed schedule, by your team (skilled & unskilled labour) including tools and tackles, Safety appliances etc. under guidance and supervision of your service / erection engineers upon written information from us.

The bidder shall be responsible for daily minimum wage, PF & ESI for the engaged manpower.

14. Drainage belt is to be replaced on the existing 10 m concrete floor in the Chemical House building at Turamdih Mill in such a way as not to affect the normal operation of the running plant.

15. The existing equipments in Chemical House should be kept running during entire installation / replacement period and area of execution will be made available on piecemeal basis broadly based on schedule to be prepared by contractor and approved by engineer – in – charge before commencement of work.

16. The diversion of instrumentation /electrical cables, pipe lines, removal and shifting of structural support / platform, launders etc. if found necessary, for the progress / completion of work will have to be covered under the scope of the Tenderer. After completion of work diverted items to be reinstalled in their original position.

17. Fabrication and installation of the mechanical structure, platform, beams etc. for handling & replacement of drainage belt. Required structural steel may be used from site as per availability only.

UCIL does not ensure the bidder for such type of availability.

20. Liaisoning with government authority for installation /supervision visit of representatives of M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle) shall under be in the scope of work of the bidder only. UCIL will only forward the documents for approval of competent authority for issue of gate pass after fulfillment of statutory requirement.

21. Replacement of drainage belt includes

- dismantling of the old drainage belt & disposal to assigned place within 500 meters of UCIL premises.
- onsite installation of the new one endless drainage belt
- alignment of air deck assembly & vacuum pan
- Installation of new slide blocks and wear belt
- centering and tracking of drainage belt by representative of M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle).
- Lateral sides trimming by representative of M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle).

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- application of lateral curbs by cold bonding by means of specific cements or by hot vulcanization in the supervision of representative of M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle).
 - drilling holes on drainage belt by representative of M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle).
 - final tracking and belt stabilization by representative of M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle).
 - belt performance test and handing over
22. Commissioning of the complete filtration system comprises successful continuous uninterrupted run of HBF with all accessories, electrical, instrumentation etc. for 7 days at desired performance as per NIT.
23. Work completion period : Replacement work of each drainage belt to be completed in all respects within two (02) months from the date of giving shutdown of horizontal belt filter. Only one belt filter will be handed over for replacement work at a time. The next belt filter will be handed over only after completion of work of previous belt filter in all respect.
24. Removal of all scraps separately to designated area within 500 mtr range as directed by the Engineer-in-charge.
25. Any other changes will be as per Minutes of Meetings & subsequent correspondences.
26. Any other items or work not specifically mentioned above but required for the replacement of drainage belt will have to be arranged by bidder with no extra payment.

D. SCHEDULE OF ITEMS

Sl. No.	Item	Qty. Required	Source of Supply
01.	Drainage Belt	02 Nos.	M/s Belt TS/ ContiTech Deutschland GmbH/ DRB (earlier name was Dongle)
02.	Belt Curbs	02 Sets	
03.	Slide Blocks	02 Sets	As per drawing
04.	Wear belt	04 Nos.	As per Specification
05.	SS-316 fasteners	As per requirement	APL /TVS /Unbrako
06.	Silicon sealant	As per requirement	Pidilite /Equivalent
07.	SS-316 packing strips	As per requirement	SAIL/ JINDAL/ TATA, Party shall ensure confirmation of MOC
08.	SS 316 Plate (Size: 3000x 1250 x 4 mm)	10 Nos.	SAIL/ JINDAL/ TATA, Party shall ensure confirmation of MOC

E. DELIVERY AND REPLACEMENT SCHEDULE

Item Category	Delivery Schedule
Supply of 1 st Drainage Belt	: within 10 months of PO

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Replacement, Commissioning and PG Test of 1 st Drainage Belt	: within 3 months of receipt and acceptance of 1 st Drainage Belt or within 2 months from the date of handing over of Belt
Supply of 2 nd Drainage Belt	: within 15 months of PO
Replacement, Commissioning and PG Test of 2 nd Drainage Belt	: within 3 months of receipt and acceptance of 2 nd Drainage Belt or within 2 months from the date of handing over of Belt

Total job to be completed within 18 months of PO

In case of urgent requirement of materials, party shall expedite the delivery & replacement schedule as per instruction of Engineer-in-Charge.

Party shall take safety work permit from concerned section in-charge, safety department & electrical section to ensure isolation of control panel before start of replacement activity of drainage belt. UCIL will remove /dismantle & reassemble the following components before and after completion of work, if required:

- Feed distribution & overflow pipe line from feed flocculator
- HBF cake discharge repulper assembly and spray water lines
- Filter media
- HBF drive planetary gear box and motor
- Limit switches & instruments
- Power supply incomer terminals to local equipments & earthlings

After removal of above items complete HBF will be handed over to the party for replacement of drainage belt as per standard procedure and guidelines by belt manufacturer.

F. DEFECT LIABILITY PERIOD:

The equipment shall be warranted against defects in material, workmanship and performance for a period of 12 months from the date of commissioning or 18 months from the date of supply whichever is later.

G. EXCLUSIONS

The following articles and work do not form a part of the tender

1. Supply of HBF accessories like feed flocculator cum Distributor, Wash Distributor, Flap Dams, Vacuum Pipeline, Vacuum Box, Belt / repulper drive Reducer/Gear Box, Drainage Belt Support rollers, guide rollers, Side Gutters, Cloth Tracking arrangement, gravity take up roller, Limit switches, Drive & Tail pulley, Bearings, Safety Trip Switches, Drip pan, Cake discharge repulper unit, Filter Basin, Ventilation System etc.

2. Any kind of civil work in extractor area for replacement of drainage belt.

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3. Raw water, acidified water and lubricating oil.
4. Utilities (water, power, air, gas, etc.) and filter media required for commissioning of belt filter
5. Feed slurry and water for the belt filter operation after start up.
6. Spares for maintenance of belt filter

H. TEST REPORT/DOCUMENTATION (3 sets each):

Party shall submit the following documents :

- Drainage belt and curbs purchase certificate from manufacturer.
- Custom clearance and bill of entry for imported items.
- Pre-dispatch internal inspection / test reports of bought out items
- Drainage belt drawing showing overall length, width, thickness, cross sectional & carcass details, grooving and hole drilling pattern, curbing details, detailed specifications and MOC of belt etc.
- Drainage belt replacement standard procedure and guidelines by belt manufacturer.

I. Facilities to be provided by UCIL:

- Utilities like power, water, compressed air etc shall be provided by UCIL at free of cost
- EOT crane of 10 MT capacities are available on belt filter floor at feed end and discharge end of belt filter. It may be spared if any maintenance work is not going on in any other filters.
- Handling equipment like Forklift, Crane may be provided subject to availability.
- Consumables like cutting gas cylinders, welding machine may be provided at site for a mutually agreed time period subject to availability
- Guest House accommodation is not available at our site. Lodging/ boarding for erection team to be arranged by bidder.

J. General:

a. **Warranty** : The drainage belt and curb joints must be warranted for manufacturing defects / poor workmanship for trouble free performance for 12 months from the date of commissioning.

b. **Population List**: The Tenderers should furnish the list of customers to whom they have supplied and commissioned complete belt filter unit or drainage belt in the last seven years giving the contact person's name, telephone numbers and addresses of the customers, date of commissioning, with copies of purchase orders and certificate of performance from the customers.

c. The Tenderer shall submit his tender strictly in accordance with the tender specification and terms & conditions laid down in the tender document.

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d. By submitting a tender for the work, a Tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the work, if so required and that the rates quoted by him in the tender will be adequate to complete the work in all respect according to the specification and other working conditions.

e. **Storage and Handling:** Storage, handling, securities of all supplies, erection etc. will be completely in the scope of the bidder. The corporation will not provide and facility for the above. However the bidder may use installed crane facility for erection purpose whenever it is available. The corporation may provide space for construction of storage facility and office near the work site.

f. Consumables, tools & tackles, safety appliances, material-handling equipments etc. required for erection & commissioning of the system will have to be arranged by the bidder at his own cost.

g. Power supply & water : The corporation will provide power supply free of cost at one point from where the bidder will have to make his own arrangement for its distribution. Water may be used from existing tapings available in the plant with prior permission.

h. **Submission of drawings:** Complete set of drawing for approval shall be submitted within 1 (one) months of date of issue of Purchase Order. UCIL will send back the approved copy of drawing within 30 days of its receipt. The party has to submit six (6) hard copies of final approved drawing and one (1) soft copy.

i. Proper care should be taken to ensure safety and security of workers engaged in the job. In case of any accident and injury to the workers or any other person directly or indirectly involved in the work during execution of the job, the contractor shall have to compensate them at their own cost. UCIL will have no responsibility, whatsoever, and will be kept fully indemnified and harmless in this regard. The contractor shall make adequate insurance policy at their own cost so that the workmen employed by them are sufficiently covered against risk of any accident.

j. Contractor shall appoint full time Safety officer. In case of non-availability of safety officer, EIC may close the work & impose a fine of Rs 1000/- per day.

k. Statutory central minimum wages alongwith PF and ESI to all skilled/unskilled labour shall be paid by the contractor as per the latest notification of the government/ local authority. Documentary evidences of payments shall be submitted to the EIC.

l. The contractor shall have to maintain all statutory register as required under the Contract Labour Regulation and Abolition Act, Payment of Wages act, Minimum Wages Act, Factory Act etc. the statutory return to be submitted to the personnel Department / Statutory bodies as required under the acts and Rules.

m. The contractor has to maintain details on

- Records of medical examination of their employees before joining
- Records of initial training before engagement to job

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- Records of contractor workers mentioning their category of employment, age, Father's name, Address, contact number, photographs, police verification details, ID proof etc.
 - Records of issuing PPE's to contract workers
 - Records of re-training to contract workers
 - Records of affidavit cum declaration regarding no claim for employment with UCIL by contract workers on non-judicial paper of Rs 20/- duly attested by Notary Public.

n. All materials except those agreed to be supplied by the Owner shall be supplied by the contractor at his own cost and the rates quoted by the Contractor should be inclusive of all royalties, rents, taxes, duties, octroi, statutory levies, if any, etc.

o. The contractor shall make all arrangements at his own cost to transport the required materials outside and inside the working places and leaving the premises in a neat and tidy condition after completion of the job to the satisfaction of Owner.

K. PERFORMANCE CRITERIA

Performance Guarantee and Penalty Clause

The following factors shall be guaranteed during continuous operation of Filtration system after successful commissioning :

A. Soluble uranium loss with the cake discharged after filtration in the HBF (in case of drainage belt installation in acidic belt filter only. This will not be applicable for neutral belt filter) – It must be less than 2 % of the total uranium input with the rated feed slurry to the HBF. Sample for analysis to establish this guarantee will be drawn on 8 hours shift basis.

B. Feed handling capacity – (a) 50 Tons per hour of dry solid at 55 % (w/w) feed consistency for acid slurry filter & (b) 70 tons per hours of dry solid at 55 % (w/w) feed consistency for neutral filter.

C. Total volume of liquor and filtrate generated – It shall be less than 1 cubic meter per ton of dry solid filtered through the HBF in acid slurry filter.

Penalty:-

1. For every 5% less feed rate, L.D. shall be levied @ 1% of PO Value of each belt subject to a max. of 5% of PO Value of each belt or part thereof.

2. For every 0.5% increase in uranium loss in the cake (in acid belt filter), L.D. shall be levied @1% of PO Value of each belt subject to a max. of 5% of PO Value of each belt or part thereof.

The maximum aggregate liability towards non-performance and late delivery shall not exceed 10% of the total PO value.

Analysis of discharge filter cake for soluble uranium (filtration) loss shall be done in laboratory of UCIL, Turamdih only, result of which shall be final & binding for both the parties

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Average result of seven days continuous run after successful commissioning will be considered to establish the achievement of performance clauses mentioned above. Repeat run or event of failure in the previous run to establish the performance guarantee clauses must be completed within one (01) month of start of first P.G. test. Maximum Four Repeat Tests are allowable. The results of last P.G. test shall be taken as full & final for release of related payment with no further consideration.

Consequential damages and Limitations of Liability:

Supplier shall not be liable towards the purchaser and purchaser shall not be liable towards the supplier for loss of production, loss of profit, loss of use, loss of contracts, or for any other consequential, incidental, special or indirect loss whatsoever. The total aggregate liability shall be limited to 100% of the purchase order value.

L. TECHNICAL SPECIFICATIONS OF HORIZONTAL BELT FILTER FOR WHICH DRAINAGE BELT IS REQUIRED

The drainage belt for HBF shall be designed for the following conditions:

Description	Neutral Slurry HBF	Acid Slurry HBF
Feed TPH of dry solid	70	50
Feed slurry consistency	45 - 50 % solid (w/w)	55-61 % solid (w/w)
Specific Gravity of solid	2.8	2.8
Specific Gravity of liquid	1.0	1.05
Temp. of feed slurry	Ambient	55 – 60°C
Size distribution of solid in slurry	1% + 48 mesh	1% + 48 mesh
	60% – 200 + 325 mesh	60% – 200 + 325 mesh
	rest – 48 and + 200 mesh	rest – 48 and + 200 mesh
Cake wash water	Not required	19.5 m ³ /hr
Cloth wash water	14 m ³ /hr	14 m ³ /hr
Belt wash water	7 m ³ /hr	7 m ³ /hr
Vacuum Box Seal	3.5 m ³ /hr	3.5 m ³ /hr
Belt lubrication water	2.4 m ³ /hr	2.4 m ³ /hr
Support Deck air flow rate	9952 m ³ /hr	9952 m ³ /hr
Cake moisture	20-22 %	20-22 %
pH of slurry	6.5 – 7.5	1.5 – 2.0
Moisture content of discharge cake	< 22% (w/w)	< 22% (w/w)
Clarity of filtrate / washings	< 1000 ppm solid	< 1000 ppm solid
Belt width	3.2 m	3.2 m
Soluble uranium loss in discharge cake of HBF	-	< 2% (w/w) of total U ₃ O ₈ present in the feed slurry to HBF
Total volume of filtrate and washing generated	-	< 1.0 m ³ per ton of dry solid filtered (inclusive of mother liquor)
Stages of washing	Nil	One with fresh acidified water and two with counter current washing by recycle.
Temperature of vapour entering vacuum pump	35°C	35°C

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Filtration area	83 Sq.mtr.	83 Sq.mtr.
Vacuum pan length	27.735 meter	27.735 meter
Duty	Continuous	Continuous
Air deck /vacuum pan MOC	SS-316	SS-316
Operational vacuum	430-550 mm of Hg	430-550 mm of Hg
Capacity of vacuum pump	8250 m ³ /hr@600 mm of Hg	8250 m ³ /hr@600 mm of Hg

Details of filter fabric used for Filtration:

Type: PP Monofilament Double layer weaved

Thickness: 920 micron (approx.)

Air permeability: 1400 ± 10% (litres /m².sec @2mb)

Flocculent used: Synthetic Polyacrylamide (Non-ionic grade)