NTPC LTD
CC-OS
EOC NOIDA

A)	**Details of MEG** (MATERIAL ENLISTMENT GROUP)	
	1.0 MEG No.	55MEG-28
	2.0 MEG Description	STEEL CORD CONVEYOR BELT up to 1400 mm width
	3.0 Responsibility centre	CC

B) **Technical Criteria of QR:**

1. The applicant should be a manufacturer of STEEL CORD Conveyor Belt of width 1400 mm or higher & strength 630 kN/Mtr and above. The applicant should have supplied Steel Cord conveyor belt of width 1400 mm or higher and strength 630 kN/Mtr and above, to actual user(s) or to main contractors of bulk material handling plant package having conveyors.

2. The applicant should have Conveyor production unit with following facilities:
   I. The production unit should have "a closed chamber internal mixer (Excluding kneaders) in operating condition" at his own manufacturing unit with the following features and functionalities:
      - With an absolute volume of minimum 65 Litres.
      - With auto timer to indicate set time and elapsed time.
      - With auto temperature control with Cycle temperature chart showing set temperature and actual.
      - Input energy indicator for mixing
      - Ram pressure controller and indicator.
   II. The production unit should have cold /hot feed extruder to draw cover rubber in single sheet with no longitudinal joints.
   III. The production unit should have a transparent standard practice of traceability of end product (belt) with raw materials.
   IV. The production unit should have a standard practice of rheological tests.
   V. The production unit should have a separate internal Quality Assurance (QA) wing with Rubber Technologist. The Rubber Technologist should meet the following criteria.

   BE/BTech/MTech/PhD, in "Rubber Technology / Polymer Science & Rubber technology / Polymer Science & technology / Polymer Science & Engineering / Polymer Technology" with minimum 5 years of *experience in Conveyor belt industry / Tyre Industry / Transmission belt industry.

   OR

   M.Sc, in Polymer science / Polymer Chemistry / Chemistry with specialization in organic chemistry / Industrial polymer chemistry with minimum 10 years of *experience in Conveyor belt industry / tyre industry / Transmission belt industry. A certificate course in "Rubber Technology" from a reputed institute such as IIT (Kharagpur), IRMRA or Rubber Research Institute of India (RRII, Kottayam, Kerala) or any internationally certified courses in Rubber technology conducted by institutes like ARDL, LRCCP, UNESCO and Smithers is preferable.

   OR

   B.Sc, in Chemistry with minimum 15 years of *experience in Conveyor belt industry / Tyre Industry / Transmission belt industry. A certificate course in "Rubber Technology" from a reputed institute such as IIT (Kharagpur), IRMRA or Rubber Research Institute of INDIA (RRII, Kottayam, Kerala) or any internationally certified courses in Rubber technology conducted by institutes like ARDL, LRCCP, UNESCO and Smithers is preferable.

	VI. The production unit should have following testing / measurement facilities: a. Drum Friction Test Arrangement as per CAN/CSA b. Abrasion Resistance Test apparatus & Standard Rubber Sample for cover rubber as per DIN:53516 c. Arrangement for Flame Test as per ISO 340 d. Arrangement for Electrical Surface Resistance Test as per CAN/CSA e. Troughability Measuring arrangement with Measuring Instruments. f. Humidity & Temperature Controlled testing room / chamber for samples conditioning. g. Rheological Test Instrument. h. Tensile Strength for belt & cover as per DIN 22131/ IS-15427/ AS1333/ ISO 15236 i. Tear Strength Test for cover as per ASTM D624 j. Oven for ageing test with temperature recorder k. Cord breaking strength test facility l. Individual Cord tensioning facility with separate tensioning measuring instrument m. Dynamic cord pull out test facility n. Air penetration test facility * As proof of Industry exposure, 'Experience Certificate', 'Appointment Letter & Relieving Letter', 'Salary Slips', Form 16', etc. can be the credentials. The experience certificate issued by any industry as mentioned above is acceptable.
C)	**<u>Documents to be submitted by the applicants against qualifying requirements:</u>** i. QR Sl. (1) - Catalog / Brochure / Leaflet of Steel Cord Belt being manufactured by the applicant or any other relevant documents like ISO Certificate, Customer approved manufacturing quality plan. + LOA / Purchase Order and execution proofs of same LOA / PO in support of supply of Steel Cord Conveyor Belt of width 1400 mm or higher having minimum strength 630 kN/Mtr. ii. QR Serial 2 – Self declaration along with regarding availability of all the stipulated machines/ facilities along with supporting proofs like invoice/ calibration certificate/ photograph/ other supporting documents as applicable. <u>Other documents to be submitted:</u> 1. Three POs of highest executed values of similar work during last five years from the date of application (PO date should not be more than five (5) years old as on the date of the application) along with copy of invoice / completion certificate from the concerned buyer/s in support of successful execution of supply against POs. 2. Audited balance sheet including profit and loss statement for the previous three completed financial years reckoned from the date of application. In case the audited results for the preceding financial year is not available, certification of financial statements from a practicing chartered account may be submitted. In case, Applicant is not able to submit the certificate from practicing chartered Account certifying its financial parameters, the audited results of three consecutive financial years preceding the last financial year shall be considered for evaluating the financial parameters. Further a Certificate would be required from the CEO/CFO as per the format enclosed in the application format documents stating that the financial results of the company are under audit as on the date of Application and the Certificate from the practicing Chartered Accountant certifying the financial parameters is not available. 3. Any other document in addition to the above which the applicant wants to submit.

D)	Note-1	Similar works means: Supply of Steel Cord Conveyor Belt of minimum width 1400 mm.
	Note-2	The executed value means basic value of quantity of similar works executed / supplied against the reference PO (also applicable to partly executed POs as on the date of application). Where PO value is composite (i.e., including taxes etc.) the applicant to give item-wise break up of composite PO mentioning basic value, taxes etc.

Technical Specification for Steel Cord Conveyor Belt

Sl	Description
1	**Intent of Technical Specifications** This technical specification is intended to cover the supply of spare steel cord belting of Coal Handling Plants at various stations of NTPC as per attached details and requirement.
2	**Material to be handled** Conveyor belts shall handle coal upto 250 mm size (occasionally 1-2 % 400 mm size lumps). Coal may contain shale/stone upto about 20%. Total Moisture can be as high as 40%. HGI of coal shall be around 44-65. Coal may occasionally carry metal pieces also. Conveyor can be started in loaded condition at 110% of rated capacity
3	**Bulk density of coal** For the purpose of volumetric calculations bulk density of coal is taken as 800 kg/m3. However, for load calculations bulk density is 1100 kg/m3. Belt speed is max. 3.4 m/sec. Pulleys are lagged with grooved rubber or ceramic tiles.
4	**Environmental conditions** Belt can be used either in conveyor galleries or in the open yard where it is subjected to heavy rains, sunlights, dust storms, hails etc. The belt shall be suitable for tropical environment with temperatures ranging from 0- 50 deg C. The belt can be used in track hoppers/ underground conveyor galleries where extreme humid conditions and pouring water is not uncommon.
5	**Codes and Standards** The belt shall conform in all respects to the latest applicable Indian Standards or equivalent International Standards except where specifically modified or supplemented by this specification in the relevant paras below : The conveyor belt under this technical specification shall conform to : Fire Resistant Grade, Steel cord construction, as detailed below. All the standards applicable should be latest version, published 60 days prior to techno commercial bid opening date: (a) IS:15427 (b) DIN 22131 (c) AS:1333 (d) ISO 15236 (e) IS : 3400 (f) ISO : 340 (g) ASTM D624 (h) CAN CSA - M422 M87 (i) Additional requirement as specified below In case of any conflict in the standards and specifications, generally, specified value shall prevail and the decision of the Purchaser shall be final and binding.

TECHNICAL SPECIFICATION FOR STEEL CORD CONVEYOR BELT				
Sl no	**Description**	**Value**	**Ref. Standard**	**Remarks**
1.0	Belt designation, type, rating/ strength	Refer annexure A		
2.0	Belt Construction			
2.1	Belt Width	Refer annexure A	IS-15427 /DIN 22131/ AS1333/ ISO 15236	No longitudinal joint of cover rubber is allowed.
2.2	Number of Cords, Cord Diameter, Cord Pitch & Cord construction	Refer Annexure A	Refer standard at annexure A	No joint of cord is allowed.
2.3	Top Cover Thickness (Minimum)	8.00 mm		Refer cl. No. 10.0
2.4	Bottom Cover Thickness(Minimum)	6.00 mm		Refer cl. No. 10.0
2.5	Edge width free of cord	Min 15 mm, Max 50 mm		
2.6	Cover rubber grade	FR, as per ISO 340	ISO 340	
3.0	Cord Breaking strength	Refer standard at Annexure A		
4.0	Adhesion			
4.1	Cord to Bonder Adhesion (Cord pull out) before ageing	As per DIN 22131	DIN 22131	
4.2	Cord to Bonder Adhesion after ageing	As per DIN 22131	DIN 22131	
4.3	Cover to Bonder Adhesion (Peeling)	As per DIN 22131	DIN 22131	
4.4	Dynamic Cord pull out	10000 cycles	IS- 15427/ AS1333	
5.0	Cover Rubber Physical Properties			
5.1	Tensile strength (Minimum)	17 MPa		IS3400 (Test method)
5.2	Elongation at Break (Minimum)	400%		IS3400 (Test method)
5.3	Abrasion loss (Maximum)	175 mm3		IS3400 (Test method)
5.4	Tear resistance (Minimum)	30 N/mm		ASTM D624 (Test method)
5.5	Hardness	Shore-A: 70 +/-5		IS3400 (Test method)
5.6	Change in tensile strength after ageing at 70 deg c for 168 hrs.	+/ -25%		IS3400 (Test method)

TECHNICAL SPECIFICATION FOR STEEL CORD CONVEYOR BELT				
Sl no	**Description**	**Value**	**Ref. Standard**	**Remarks**
5.7	Change in Elongation at break after ageing at 70 deg c for 168 hrs.	+/ -25%		IS3400 (Test method)
6.0	Troughability at 35 degree(Minimum)	0.14		ISO 703 (Test method)
7.0	Fire Resistance Properties			
7.1	Flame resistivity	As per ISO 340	ISO 340	
7.2	Electrical resistivity	As per CAN CSA M422 M87-Type-C	CAN CSA M422 M87-Type-C	
7.3	Drum Friction Test	As per CAN CSA M422 M87-Type-C	CAN CSA M422 M87-Type-C	
8.1	Length of belt roll	Refer annexure A		
8.2	Tolerance in belt length	As per DIN 22131	DIN 22131	No negative tolerance allowed.
9.0	Marking on belt	As per IS-15427/ DIN 22131/ AS1333/ ISO 15236	IS-15427/ DIN 22131/ AS1333/ ISO 15236	
10.0	Rip Protection (Rip check fabric)	Rip protection shall be of Nylon fabric breaker (of weft strength minimum 150kN/m) for top cover continuously. Cover thickness shall include breaker layers.		
11.0	Marking on belt drum	Each drum shall have following information written on it by indelible ink/painting. Contract/ Award no Name and address of consignee Manufactures name and address Drum no Size of the drum Belt length in mtr Gross weight of the drum with belt Belt detail Arrow marking for uncoiling		
12.0	Packing	Belt roll shall be packed with metal frame having central metallic core pipe and suitable for handling and storage.		

TECHNICAL SPECIFICATION FOR STEEL CORD CONVEYOR BELT				
Sl no	**Description**	**Value**	**Ref. Standard**	**Remarks**
13.0	Patch repair norms	1. **Edge Repair**: The edge rubber being largely unsupported, is susceptible to surface blemishes at the time of curing. Such blemishes often required to be repaired and such cases are usually longer along the belt length and narrow in width and localized on the belt edge with slight spill over to the top/bottom cover adjacent to the edge. 2. **Patch Repair**: Localised rectification of surface blemishes/defects in cured belt by using rubber compound similar to the mother compound upto the cords followed by vulcanization. 3. **Buffing/Dough filling**: Entrapment of foreign matters may be buffed suitably. Depth of buffing should not exceed the difference in thickness of cover rubber (as measured in test sample for the purpose of acceptance of cover rubber thickness) and the specified minimum cover thickness. Where indentation depth is more, the same may be filled with rubber compound followed by vulcanization locally. Small local repair by dough filling of size 25mmx25mm to a limited extent shall not be counted as repairs. However incase of cluster of repairs, the same shall be counted as patch repair. 4. Maximum number of repairs as per slno 2, shall be limited to 5 nos per 100mtr belt length.(rounded upto higher unit). Eg for 250mtr belt length, max no of repairs allowed shall be 5 x (250/100)=12.5 ie 13 nos. 5.Total number of repair as per sl no 2 & 3 shall not exceed 10 nos per 100mtr of belt length (rounded upto higher unit) 6. In case of patch repair as indicated in sl no 2,the maximum size/area shall be limited to 1/5 Wx1/5 W (W is belt width). No single dimension shall exceed the one fifth of belt width.		

Annexure-A

(To be filled by station)

Sno	Description	Belt Type 1	Belt type 2	Belt type 3	Belt type 4
1	Belt Designation (Type, Rating/ Strength in kN/m)				
2	Belt Width (in mm)				
3	No. of cords (in no.)				
4	Cord diameter (in mm)				
5	Cord pitch (in mm)				
6	Standard to be followed (for no. of cords, cord diameter, cord pitch, cord construction and cord breaking strength)	**	**	**	**
7	Length of belt roll (in meter)				

**** Any one of these standards viz. DIN 22131 or AS1333 or IS 15427 or ISO 15236 as per existing site requirement to be indicated**

	ITEM: STEEL CORD CONVEYOR BELT	QUALITY PLAN (CONFORMING TO CODE: IS-15427/ DIN-22131/ AS-1333/ ISO-15236)	QP NO.: 0000-999-QOM –S -090 REV. NO: 0 DATE :14.12.2016 VALID UP TO: PAGE 1 OF 2	REVIEWED BY:	APPROVED BY:

S.N.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	10.			11.
1.0	**FINAL INSPECTION: SAMPLE SHALL BE TAKEN FROM ANY ROLL AND FOR FR PROPERTIES COVER RUBBER SAMPLE CAN BE TAKEN FROM ANYWHERE OF BELT**													
1.1	Rubber Cover Properties	Cover TS & Elongation at break: a) Before ageing b) After ageing	Critical	Physical	As per sampling plan DIN 22131		Technical Specification	Technical Specification / IS 3400	Test Report	√	P	W	W	
1.2		Abrasion loss	-do-	-do-	-do-		-do-	-do-	-do-	√	P	W	W	
1.3		Tear strength	-do-	-do-	-do-		ASTM D624 / Tech Spec	Technical Specification	-do-	√	P	W	W	
1.4		Shore Hardness	-do-	-do-	-do-		-do-	-do-	-do-	√	P	W	W	Hardness to be checked during surface checking throughout the belt
2.1	Adhesion Test	Cord Pull out strength before ageing and after ageing	-do-	-do-	-do-		Technical Specification	Technical Specification/ DIN 22131	-do-	√	P	W	W	
2.2		Peeling resistance between cover & bonder	-do-	-do-	-do-		-do-	-do-	-do-	√	P	W	W	
2.3		Dynamic pull out test	-do-	-do-	1 per offered lot		IS- 15427/ AS1333	Technical Specification/ IS- 15427/ AS-1333	-do-	√	P	W	W	
2.4		Air penetration test	-do-	-do-	-do-		DIN 22131	DIN 22131	-do-	√	P	W	W	
3.1	Dimension (Sample)	Width, Cover thickness, edge width, cord dia, cord pitch / location, No. of cords, position of cords	-do-	-do-	As per sampling plan DIN 22131		Technical Specification / IS-15427 /DIN- 22131/ AS-1333/ ISO- 15236	Technical Specification/ IS-15427 /DIN- 22131/ AS-1333/ ISO- 15236	-do-	√	P	W	W	
4.0	Troughability	Troughablity	-do-	-do-	-do-		Technical Specification/ ISO 703	Technical Specification	-do-	√	P	W	W	

LEGEND: * **RECORDS**, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
** M**:** MANUFACTURER/SUB-SUPPLIER **C:** MAIN SUPPLIER/TPIA, **N**: NTPC **P:** PERFORM **W**: WITNESS AND **V:** VERIFICATION. AS APPROPRIATE, **CHP:** NTPC SHALL IDENTIFY IN COLUM "N" AS 'W' DP- DUTY POINT , UT- ULTRASONIC TEST,IR- INSPECTION REPORT,MTC- MATERIAL TEST CERTIFICATE

NOTE:# NTPC INSPECTION ENGINEER TO CHECK, APPROVAL DATE/ REVISION NO. OF REFERENCE DOCUMENTS AT THE TIME OF INSPECTION

एनटीपीसी NTPC	ITEM: STEEL CORD CONVEYOR BELT	QUALITY PLAN (CONFORMING TO CODE: IS-15427/ DIN-22131/ AS-1333/ ISO-15236)	QP NO.: 0000-999-QOM –S -090 REV. NO: 0 DATE :14.12.2016 VALID UP TO: PAGE 2 OF 2	REVIEWED BY:	APPROVED BY:

S.N.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	10.			11.
5.0	RIP Protection	Nylon Breaker	Critical	Visual	As per sampling plan DIN 22131		Technical Specification	Technical Specification	-do-	√	P	W	W	
6.1	Fire Resistivity Test	Flame test	-do-	Physical	-do-		ISO-340	ISO-340	-do-	√	P	W	W	
6.2		Drum Friction Test	-do-	-do-	-do-		CAN/CSA/ M422/M87 (TYPE-C)	CAN/CSA/M422 /M87(TYPE- C)	-do-	√	P	W	W	
6.3		Antistatic Test (Electrical resistivity	-do-	-do-	-do-				-do-	√	P	W	W	
7.0	Steel Cord	Cord Breaking Strength	-do-	-do-	-do-		Technical Specification	Technical Specification	-do-	√	P	W	W	Cord Strength shall match with manufacturer's TC
8.0	Surface Appearance	Surface repairs	-do-	Visual	-do-		Technical Specification	Technical Specification	-do-	√	P	W	W	
9.0	Packing & Marking	Packing Procedure	Major	Visual	100%		Mfr's std	Mfr's std	-do-	-	P	V	-	

Marking & Identification: Belt Nos offered for inspection & Belt Nos. from which samples are drawn for testing, shall be indicated in CHP. Accepted Belt No. shall be identified with signature with date using permanent marker as well as NTPC hard punch in white paint. The identification marks shall be preserved by the manufacturer.

NOTE A: FOR FLAME TEST SAMPLE SHALL BE TAKEN FROM ANYWHERE OF BELT OFFERED FOR INSPECTION:

1) Cut sample piece of size 300mm x 300mm from the belt end sample collected during inspection and remove cover rubber from it. Put sign by marker pen on the remaining bonded sample.
2) Remove top cover rubber and bottom cover rubber from any position from the belt as desired by NTPC representative / Inspection Engineer so that 300 x 300 size top & bottom cover samples are available. Top and bottom rubber shall not be removed from the same spot. Put sign by marker pen on the cover rubber samples.
3) Put removed Top and Bottom cover rubber (removed from anywhere in the belt - refer Sl no 2) on to the bonded sample (refer sl no -1) to make the full sample piece at laboratory.
4) Vulcanize the sample at lab press keeping same curing condition as in mother belt.
5) After cooling down, buff both sides of the sample piece.
6) The above process shall be carried out in presence of NTPC representative / Inspection Engineer
7) Prepare the test sample as per ISO 340 for flame test to perform.
8) Repair the top and bottom cover in the mother belt. These repairs will not count for total no. of repairs.

LEGEND: * **RECORDS**, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
** M**:** MANUFACTURER/SUB-SUPPLIER **C:** MAIN SUPPLIER/TPIA, **N**: NTPC **P:** PERFORM **W**: WITNESS AND **V:** VERIFICATION. AS APPROPRIATE, **CHP:** NTPC SHALL IDENTIFY IN COLUM "N" AS 'W' DP- DUTY POINT , UT- ULTRASONIC TEST,IR- INSPECTION REPORT,MTC- MATERIAL TEST CERTIFICATE

NOTE:# NTPC INSPECTION ENGINEER TO CHECK, APPROVAL DATE/ REVISION NO. OF REFERENCE DOCUMENTS AT THE TIME OF INSPECTION