GNFC

# Technical Specifications of HDPE Bags

## General Specifications for Circular Woven, Laminated High Density Polyethylene (HDPE) Bags.

### 1. General

1.1. The supplier shall manufacture and supply HDPE bags for packing of Neem coated Urea / Imported Urea / Technical Grade Urea / TDI Tar Powder strictly conforming to IS-9755: 2021 and following specifications.

1.2. The bags to be supplied shall be of HDPE fabric woven in circular looms (having no twisting of WEFT) with inside lamination by way of inverting the cylinder of fabric after it is laminated. The bags shall be without any side seam. 'L' stitched bags made of circular woven HDPE fabric shall not be accepted.

1.3. HDPE fabric will be woven with identification strips as specified below.

### 2. Size & Capacity

2.1. The capacity of each HDPE bag to fill Neem Coated Urea, Imported Urea & TG urea bag shall be to hold 45 kg of product. The capacity of each **TDI Tar Powder bag** shall be to hold 50 kg of product.

The inside dimensions of bags of different product shall be as under:

| Bag type | Length | Width | Minimum inside area |
|---|---|---|---|
| **HDPE BAG** | 880 +20 mm / - 10 mm | 600 + 20mm / - 10 mm | 0.519 $m^2$ |

Length and width both should not be short simultaneously. The dimensions of bags shall be within above mentioned tolerance and within specified limit of minimum inside area.

### 3. Fabric:

3.1. The fabric shall be woven from HDPE tapes conforming to IS-6192 (Latest) and shall be free from all major weaving defects like pick points, missing tapes etc. and it shall

be free from biasness also.

3.2. The construction of the HDPE fabric shall be as per the specifications given below.

3.3. The bag shall be made from single piece of laminated HDPE woven fabric. The appearance of bag shall be (i) Yellow for Bharat Urea (Neem coated urea) & Imported Urea and (ii) Milky white with Blue tone for Technical Grade Urea and TDI Tar Powder bags. Required quantity of correct quality of Master Batch should be used for Yellow / Milky white with Blue tone appearance of the fabric and Bag. Vendor to submit sample before bulk supply for approval of appearance of bag.

## 4. Calcium Carbonate ($CaCO_3$)/Ash Content :

4.1. Testing shall be carried out by GNFC or GNFC appointed laboratory as per IS 9755:2021 Annexure-C.

4.2. Maximum limit of $CaCO_3$ allowed is 10% (Ash Content 6%). In case test result exceeds $CaCO_3$ limit of 10% (Ash Content 6%), the lot is to be accepted up to 12% Calcium Carbonate content (7% Ash content) with applying penalty at the rate double by which Calcium Carbonate content is higher than 10% (Ash Content 6%). If test result exceeds 12% of Calcium Carbonate content (Ash Content 7%), the lot is to be rejected.

4.3. In case of more than two incidents of $CaCO_3$ exceeding 12% (Ash Content 7%), the supplier will be put in holiday list.

## 5. Lamination :

5.1. The circular woven fabric shall be inside lamination by way of inverting the cylinder of fabric after it is laminated on outer side with virgin quality low density polyethylene (LDPE) film on a lamination plant. The laminated film should overlap and seal each other at side crease and should be kept minimum 5 mm extra and not more than 10 mm after trimming. The lamination shall be free from pinholes, porosity, patches, tears, poor lamination, blisters or any other visible defects.

5.2. The thickness of lamination shall be 100 gauge (25 micron) with tolerance of ± 5%. The lamination mass shall be 23 $g/m^2$. The lamination shall cover the entire outside area of the fabric used in the bag.

5.3. The suppliers before dispatching the laminated bags should ensure the quality of lamination. Any lamination failure at GNFC during sample testing or during use of bags if noticed, the entire lot of bags shall be rejected and unused bags shall be cross marked. Payment shall be recovered from any pending bills.

5.4. During lamination of HDPE fabric, required quantity of Master batch shall be used to give Yellow / Milky white with Blue tone appearance to Bag.

**6. Stitching :**

6.1. Stitching threads at the bottom of bags should be postal red color.

6.2. The bottom of the bag shall have minimum 25 mm folding when measured from outside. The bottom of bags shall have two fold (6 layers).

6.3. The bag shall be stitched at the bottom with two rows of chain stitches with number of stitches shall be 12 ± 2 per dm. The materials used for stitching shall be Polyethylene or polypropylene multifilament yarn, spun yarn twisted thread or fibrillated tape yarn suitable for the purpose having breaking load not less than 90 N. The material for stitching shall be UV stabilized. The stitching shall be uniform without any loose thread or knot.

6.4. The distance between the rows shall be minimum 5 mm. The outer row shall be minimum 8 mm from the outer edge of the bottom of the bag.

**7. Strength :**

7.1. The minimum breaking strength of the samples drawn from the lot of laminated bags shall be as follows :

| | |
|---|---|
| Lengthwise | : Minimum 91.8 kgf. |
| Widthwise | : Minimum 91.8 kgf. |
| Widthwise at lamination joint | : Minimum 91.8 kgf |
| Bottom seam | : Minimum 40.8 kgf. |

7.2. The elongation of the laminated fabric, while testing shall not be less than 15% and more than 25%.

**8. Mesh, Denier :**

8.1. The bags shall be 10 x 10 mesh with minimum 2.5 mm tape width. The bags shall have close weaving. The denier of the tape used for fabric shall be 1000 denier for all types of bags.

**9. Mouth Of Bag :**

The mouth of the bag shall be selvedge hammed or heat cut so that the tapes do not fray.

## 10. Printing :

10.1. The printing will be on Single side of bags as per the art work given by GNFC. The supplier shall have to obtain sample approval for the colour / printing matter / shade / ink quality before bulk supply. The printing matter layout should be exactly as per the sample transparency (supplied to vendor) in terms of total matters including font type size, logo size spacing of letters, spacing of words, spacing of lines and overall size / dimensions of the printing matter.

10.2. Colour of printing matter should match the specification including multi-colour image. You shall use Rub Resistant Ink / Reducer of good quality which shall pass rub resistance test. Please specify the ink used, in the Quality Assurance Certificate.

10.3. For rub resistant test, we shall use yellow duster / buff cloth for rubbing before dispatch of bags, you shall carry out rub resistance test and peel test at your end to avoid rejection after receipt at GNFC.

10.4. The ink used shall give smudge free, indelible, clean marking, and resistant to UV rays. The ink and the other ingredients to be used for such printing shall be waterproof, scratchproof, and harmless to fabric.

10.5. Bags with colour back impression will not be acceptable. Colour should not fade during handling and transportation of bags to various locations.

10.6. The ink and the other ingredients to be used for such printing shall be waterproof, scratchproof, and harmless to fabric and shall be of sack branding quality manufactured by reputed firms. The ink used shall give smudge free, indelible and clean marking. Only Polyamide Resin based ink shall be used and only Butanol shall be used as reducing agent.

10.7. Each bag for identification shall be marked with party's code, year, month and lot number on the bottom right hand corner. Example: If you supply 2 lots in October-23 & 2 lots in November-23 it should be printed as :

Party's code : 23/10/1
Party's code : 23/10/2
Party's code : 23/11/1
Party's code : 23/11/2

Minimum lot should be 25000 nos. Bag and shall be in multiple of 500 nos.

10.8. For identification of the supplier, code no. shall be printed on each bag at the left hand side in line of "Month & Year of Manufacture". Code no. shall be specified by GNFC at the time of placement of order. You will use capital letters for code no. given to you instead of using your company monogram. These details will be in the letter size of 12

mm height only.

10.9. The bag branding testing has been indicated as above. GNFC recommends that the supplier should test the quality of branding as per the procedure narrated below, prior to dispatch of the lot.

10.10. Test procedure and details for branding shall be as follows:

## 11. Testing Procedure :

11.1. Prepare 50% Alkali solution by dissolving 250 g ram of sodium Hydroxide (Caustic Soda) in ½ Liter water (preferably distilled water). This is solution 'A'. Prepare a 50% Urea/SSP/Imported DAP/Imported MOP solution by dissolving 250 Gram of product in ½ liter water (preferably distilled water). This is solution 'B'. Cut three strips measuring 3 cm x 15 cm each from branded portion of the HDPE bag.

11.2. Take two glass measuring cylinder with capacity 250 ml. Take solution "A" in one and solution "B" in another cylinder and dip one strip in each. Let these strips be dipped for 24 hours. Keep the third strip in air for reference.

11.3. After 24 hours, the strips are to be removed from the solutions, thoroughly washed with water and dried in air, the colour of the strips should not fade as compared to the original strip kept in air.

## 12. Packing :

12.1. The bags shall be flat packed in trusses containing 500 nos. in each truss.

12.2. The trusses shall be wrapped with a HDPE of 6½ to 7 oz and stitched properly to withstand the hazards of transportation and storage.

12.3. Each truss shall be having following marking :

a. Name of the supplier
b. Type of bags and size
c. Weight of truss and no. of bags in truss
d. Sr. No. of truss
e. Lot No.
f. Purchase Order No.

12.4. If during receipt at GNFC site, the supplier is found to make a lapse on the above respect; such lot shall be rejected and returned to party without any notice.

12.5. If any shortages found in bales, entire lot will be counted at the cost of party. If repeated and heavy shortages found from lots supplied, GNFC will terminate contract during its validity and disqualify vendor from approved vendor list. The amount will

be recovered for the shortages found in the lot from due payments/Security deposit. The counting procedure will be as per norms fixed by GNFC from time to time.

## 13. Inspection and Testing :

13.1. Over and above, all relevant IS 9755:2021, Sixth Revision specifications shall be followed.

13.2. Inspection shall be carried out by GNFC and / or by GNFC appointed agency at GNFC works and / or at Manufacturer's works as per the convenience of GNFC. However, inspection carried out by GNFC at GNFC site shall be final and binding.

13.3. The Acceptance and Penalty Norms for Bags are as mentioned here below. The suppliers are required to study the same. Any deviations to the same are not acceptable. Please categorically confirm in your offer that the same are studied and are accepted without any deviation.

13.4. Whenever re-inspection of Bags/Lot is necessary after the segregation, the re-inspection charges would be levied to party's account as under :

a. Initial (first) inspection : Nil
b. 1st re-inspection : Rs.2000/- per lot
c. 2nd re-inspection : Rs.4000/- per lot
d. 3rd re-inspection : Rs.6000/- per lot

13.5. In case the lot still becomes unacceptable, the bags will have to be taken back by the supplier at its cost after cross marking by GNFC on entire quantity of the lot.

## 14. Specification for laminated HDPE Bags :

| Sr No | Parameter | Urea / Tar |
|---|---|---|
| 1 | Packing Capacity | 45 Kg for Urea / 50 Kg for Tar |
| 2 | Length of Bag (Inside) | 880 +20 ,- 10mm |
| 3 | Width of Bag | 600 +20, - 10 mm |
| 4 | Inside area of Bag (Minimum) | 0.519 $m^2$ |
| 5 | Weight of individual bags | 122 ± 6 % grams (Minimum 114.7 gram) |
| 6 | Average weight of sampled bags drawn as per IS-9755 for inspection | 122 ± 3 % grams (Minimum 118.4 gram) |
| 7 | Tap width | 2.5 mm |
| 8 | Mesh size | 10 x10 |
| 9 | Denier | 1000 |
| 10 | Bags laminated with LDPE /LLDPE film of uniform thickness | 100 gauge (25 Micron) minimum |
| 11 | Colour of stitching thread of bottom of bag | Red |
| 12 | Nos. of stitches per dm (chain stitches) | 12 ± 2 |
| 13 | Minimum Distance between two rows of stitch | 5 mm |
| 14 | Minimum Distance of stitch from outer edge | 8 mm |
| 15 | Bottom Folding | Bag shall be double folded in 6 layers outside minimum 25 mm and stitching shall pass through all six layers of fabric. |
| 16 | Breaking Strength (length, width and at lamination joint) | 91.8 kgf Minimum |
| 17 | Breaking Strength of Bottom seam | 40.8 kgf Minimum |
| 18 | % Elongation | 15 to 25 |
| 19 | Ash Content | Max 6% |
| 20 | Colour of printing | As per GNFC print art work |
| 21 | Drop test from height of 2 meters from all side | No bags should rupture when subjected to minimum 4 nos. of drops. The bags will be dropped on the stomach during drop tests. |
| 22 | Performance of bags during actual use / bursting | During actual use of bags in bagging plant, bags should give satisfactory performance. GNFC reserves right to reject entire lot if excessive bursting (Beyond 0.10%) is found during use of bags. For such rejected lot, recovery shall be made from any due payment of party. |

## 15. Acceptance and Penalty Norms for HDPE bags:

| Sr No | Defect | Criteria for Acceptance | Norms for Penalty |
|---|---|---|---|
| 1 | <u>Physical Defects:</u><br>Skipped branding, improper logo, hook cuts, rope cuts, pin holes, back impression, weaving defects, printing mistakes, skipped or defective bottom stitching<br><br><u>Lamination Defects :</u><br>Delamination, skipped lamination<br><br><u>Type of bottom folding:</u><br>Double fold (Six layers) | (A) If such defects are observed within 10% of inspected bags, then lot shall be accepted.<br>(B) If defects are observed in more than 10% of inspected bags, party shall be asked for segregation of the defective bags at GNFC site.<br>(C) The No. of defects during inspection after segregation shall not exceed 10% of inspected bags, otherwise party shall be asked for re-segregation of the defective bags at GNFC site.<br>(D) In case during bagging, if segregated lot gives problem of stretching/bursting, then the entire lot shall be rejected and returned to the party with Cross ('X') marking on each bag. | Re-inspection charges per lot shall be as under :<br><br>1st Re-inspection : Rs. 2000/-<br>2nd Re-inspection : Rs. 4000/-<br>3rd Re-inspection :Rs. 6000/-<br><br>In case the lot still becomes unacceptable after 3 segregations, entire lot quantity will be cross marked and will be returned back to party at vendor's cost. |
| 2 | <u>Colour Fading:</u><br>Improper printing, Printing ink, colour shade of ink, colour fading etc. | Colour shade / Printing matter shall be strictly as specified by GNFC. Colour fading for the ink used shall not be acceptable.<br><br>Ink to reducer Ratio shall be maintained upto 0.5 will be the acceptance limit. | (a) If colour shade or colour fading in alkali / product solution or printing matter variation is minor (nearby to acceptable), then lot shall be accepted with penalty @ Rs 0.25 per bag.<br>(b) In case of vide variation in colour / shade / printing matter, the lot shall be rejected and returned with cross marking.<br>Acceptance of above defects with penalty will be for one time only in entire contract period and thereafter lots will not be accepted for defects of colour fading/ shade difference and will be returned to party with cross marking. |

| Sr No | Defect | Criteria for Acceptance | Norms for Penalty |
|---|---|---|---|
| 3 | No of stitches per DM (12 ± 2) : | (A) The defective bags shall be accepted one time in contract period provided seam strength is within acceptable limit after warning to party. Such defects should not be repeated in further lots supplied.<br>(B) In case during bagging, if lot gives problem of stretching / bursting, then the entire lot shall be rejected and returned to the party with 'X' marking on each bag and payment recovery of such rejection shall be made from due bills. | |
| 4 | Weight (gram) | (A1) On individual bag : - 6%<br>(A2) Average weight of samples drawn as per IS 9755 2021 Fifth Revision for inspection: - 3%<br>(B) If average weight as per (A2) is up to -3% and weight of individual sample bag is within -6%, lot shall be accepted.<br><br>(C) If average weight as per (A2) is found below -3% and if individual sample bag is within -6% limit, lot shall be accepted with penalty.<br>(D) If average weight as per (A2) is found less than -5%, or any individual bags found less than -6%, then lot shall be given for segregation at GNFC site for removal of defective bags. Such segregation would be allowed maximum 3 times per lot. Even after three segregations, if lot is not passing, it will be rejected and returned to party with "X" marking. | _<br><br>(I) Penalty shall be 10 paise /gram/bag from 122 gram and shall be on total quantity of lot.<br><br>(II) Re-inspection charges per lot shall be as under :<br><br>1st Re-inspection : Rs. 2000/-<br>2nd Re-inspection : Rs. 4000/-<br>3rd Re-inspection :Rs. 6000/- |
| 5 | Size of HDPE Bag | (A) The tolerance in length and width will be allowed +20, -10mm. However, length and width both should not be short simultaneously and minimum area as mentioned in enquiry | Re-inspection charges per lot shall be as under :<br><br>1st Re-inspection : Rs. 2000/-<br>2nd Re-inspection : Rs. |

| Sr No | Defect | Criteria for Acceptance | Norms for Penalty |
|---|---|---|---|
| | | specifications should be available.<br>(B) If size of bag/ minimum area of bag is not within specified norms in more than 10% of sampled bags, then lot will be given for segregation of removal of defective bags. Such segregation will be allowed maximum 3 times per lot. Even after three segregations, if lot is not passing, it will be rejected and returned to party with cross marking. | 4000/-<br>3rd Re-inspection :Rs. 6000/-<br><br>In case the lot still becomes unacceptable after 3 segregations, entire lot quantity will be cross marked and will be returned to party. |
| 6 | Breaking Strength :<br>(Width /Length / Lamination joint) :<br>Minimum 91.8 Kgf<br>2 samples will be cut from each bag for each length, width and lamination joint to be strength tested as per IS-9755. | (A) If strength of individual bag is greater than 82.6 kgf and average of all inspected bags is equal to or more than 91.8 kgf, then lot shall be accepted.<br><br>(B) If strength of individual bag is greater than 82.6 kgf and average of all inspected bags is between 82.6 to 91.8 Kgf, lot shall be accepted with penalty.<br><br>(C) If strength of any individual bag or average of all inspected bags is below 82.6 kgf, the entire lot shall be rejected in both individual as well as average case. Rejected lot shall be returned to the party with cross marking. | Penalty shall be :<br>15 Paise /Kgf of average/ Bag (On entire lot quantity) |
| 7 | Bottom Seam Strength 40.8 Kgf Minimum<br>2 samples will be cut from each bag to be tested as per IS-9755. | (A) If strength of individual bag is greater than 36.7 kgf and average of all inspected bags is equal to or more than 40.8 kgf, then lot shall be accepted.<br><br>(B) If strength of individual bag is greater than 36.7 kgf and average of all inspected bags is between 36.7 to 40.8 Kgf, lot shall be accepted with penalty. | Penalty shall be :<br>15 Paise /Kgf of average/ Bag (On entire lot quantity) |

| Sr No | Defect | Criteria for Acceptance | Norms for Penalty |
|---|---|---|---|
| | | (C) If strength of any individual bag or average of all inspected bags is below 36.7 kgf, the entire lot shall be rejected in both individual as well as average case. Rejected lot shall be returned to the party with cross marking. | |
| 8 | % Elongation (Length and widthwise (15 to 25%). | (A) If % elongation (Length and widthwise) of individual bag is more than 13% and average elongation is observed within the range of 15 to 25% then lot shall be accepted.<br><br>(B) If % elongation of individual bag is more than 13% and average elongation is between 13 to 15% then lot shall be accepted with penalty. | Penalty shall be:<br>15 Paise / % elongation of average/ Bag(On entire lot quantity) |
| 9 | Drop Test:<br>Bag shall be dropped 4 times from a height of 2 meters. The bag shall be<br>dropped on stomach only. | (A) During the drop test, no sample bag shall rapture. (B) if during drop test, the bags are found to rupture, the lot shall be rejected and shall be returned with 'X' marking. | |
| 10 | Bursting Rate<br>Observed during use of bag | (I) The lot during actual bagging operation if found with bursting rate exceeding limit of 0.10%, GNFC will not use such lots and same will be rejected and returned to vendor. In case lot exceeding the bursting rate beyond 0.10% and if used, GNFC will levy penalty at 3 times the actual cost of bags bursted.<br><br>(II) Lot giving problem of excessive bursting (beyond 0.10%) will be returned to vendor after cross marking. | |