

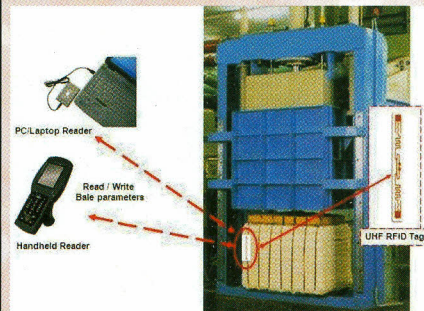
# Cotton Bale Tagging Using Barcode and RFID Technologies

A Unique Identification System for Management of Cotton Bales at Ginneries and Trade

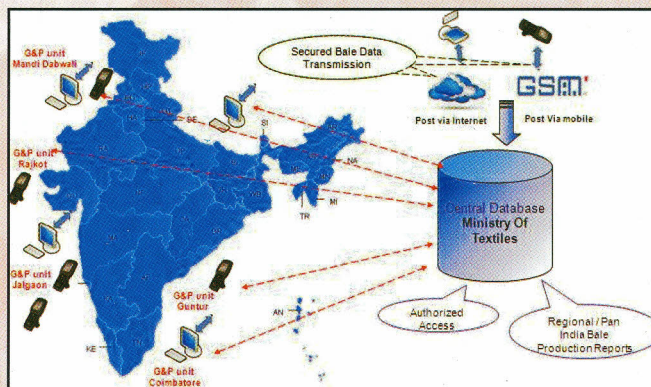
## Barcoded Cotton Bale Labelling



## RFID Tagging of Cotton Bales



## Centralized Bale Information Storage and Access Across India



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### **Introduction**

The cotton industry worldwide has rapidly adopted improvements in information technology such as high volume instrumentation (HVI) quality testing, electronic warehouse receipts and barcode-based permanent bale identification systems. HVI data for every bale is a prerequisite as it greatly reduces risks related to unexpected reductions in mill and product performance.

In India about 347 lakh bales of cotton are produced last year in more than 4000 ginneries. A ginnery processes about five thousand to one lakh bales in a year depending on its size. Manual method of bale marking and record keeping is followed in India which is very tedious and cumbersome work. Fibre quality is likely to be affected due to spreading of ink used for bale marking. Also after prolonged storage, readability of markings on bales becomes difficult due to ink fading. Further marking of fibre quality parameter on bale is not practiced in India because of limitations of manual bale marking method. Ginners have started adopting printed bale labels but a uniform practice need to be enforced for streamlining bale management and trading in the country as per requirement worldwide.

To overcome these lacunae and to have co-ordination among supplier and buyer while trading of bales – A cotton bale tagging system has been developed using Barcode and RFID technologies.

### **Barcoded Bale Label Generation**

A software 'Cotton Bale Manager' has been developed to generate unique barcoded labels for cotton bales which is integrated with bale production information along with its fibre properties. User can generate a sequence of customized labels with 16 bit barcoded bale ID. Each bale label includes information on factory name, press mark number, year of

production, lot number and barcoded bale ID. User can edit, save, and print designed labels along with search facility to access information on previously designed labels. Barcoded tags could be easily affixed over the bales. Cotton Bale Manager also assists in computerized management of bale information viz. grade, variety, bale weight, fibre length, micronaire, tenacity, uniformity ratio etc.

A fully functional query based database has been integrated with bale information for easy retrieval of vital information. The barcoded labels of 100 x 75 mm size were prepared with plastic stickers. Application of 'Cotton Bale Manager' for generation of barcoded labels would be a better alternative to conventional bale marking system and it would aid in record keeping of bales at ginnery and for efficient marketing of bales in domestic and export market.

Generate Barcode & Bale Label

Edit Product Details

Factory Name: GIMA Manufacturing Pvt Ltd


Place: Hinganghat

Press Mark: MS667 Year Of Prod: 2012 Lot Number: 0001

How many barcode needs to be generated?: 10

Generate Barcode & Bale Label

GIMA Manufacturing Pvt Ltd  
Hinganghat



MS66720120001029  
Press Mark No: MS667  
Year of Production: 2012  
Lot No: 0001

GIMA Manufacturing Pvt Ltd  
Hinganghat  
Press Mark No: MS667

Bar Code Value: BALE01

Bale Information

Year of Prod: 2012 Lot Number: 10 Current Record ID: 1

Variety: A.Comilla

Bale Weight: 170 Grade: Super

Fibre Quality

2.5% Span Length (mm): 17 UPL (%): 52

Tenacity (g/l): 14.1 MIC: 5.7

Go to a Record

Enter Identification Number: 10 Go to the Record

Current Record No: 1 Total Records: 634

<< First < Previous Next > Last >>

Edit Database Add Delete Cancel Save

Close Database

GIMA Manufacturing Pvt Ltd  
Hinganghat  
Press Mark No: MS667

Show All Search Keyword Search Quality

Search in Fields

Bale Code  Year  Lot No  Variety  Grade  All Fields

Enter Search Keywords: 2012 Search Record

Search Results

Total 12 records were found.

Year	Lot No	Variety	Bale Wt (kg)	Grade	Span Length (mm)	UPL (%)
2012	10	A.Comilla	170	Super	17	52
2012	10	A.Comilla	167	Super	17.4	52
2012	10	A.Comilla	171	Super	17.5	54
2012	10	A.Comilla	170	Super	17.9	52
2012	10	A.Comilla	167	Super	17.9	53
2012	10	A.Comilla	171	Super	18.3	52
2012	10	A.Comilla	170	Super	18.4	50
2012	10	A.Comilla	167	Super	18.5	52

Save Results Print Results Close

GIMA Manufacturing Pvt Ltd  
Hinganghat  
Press Mark No: MS667

Show All Search Keyword Search Quality

Span Length (mm): Long 27.5 to 32.4 MIC: Fine 3.0 to 3.9

UPL (%): None Tenacity (g/l): None

Search Record

Search Results

Total 130 records were found.

Variety	Bale Wt (kg)	Grade	Span Length (mm)	UPL (%)	Tenacity (g/l)	MIC
JKHV1	166	Super	30.3	46	24.4	3.6
JKHV1	169	Super	27.9	47	23	3.7
JKHV1	169	Super	28.5	48	24.1	3.7
JKHV1	169	Super	29.2	49	23.4	3.9
JKHV1	164	Super	30.6	46	25	3.9
JKHV1	169	Super	31.3	47	23	3.9
JKHV1	171	Super	29.2	45	23.4	3.9
JKHV1	170	Super	29.4	45	24.7	3.6

Save Results Print Results Close

Cotton Bale Manager Software for Barcoded Bale Label Generation and Bale Database Management

### **RFID Cotton Bale Tagging**

Cotton Bale Manager assists G&P units for record keeping of bale information and sharing the same while bale trading. Barcoding is a cheapest identification system but has its own limitations. It is not remotely accessible and its readability is affected by dust. Given application has been enhanced by implementing RFID tags in addition to barcoded labels. RFID has remote accessibility, readability not impaired by dust, information can be written / read from a distance of few centimetres to 8 meters.

### **RFID Bale Tagging System requires**

- UHF Radio frequency tags
- UHF Desktop readers/writers
- Desktop software for Ginners
- Server software for central logging of bale data and thereby enabling pairing of information

### **Features**

Mechanism to uniquely identify and track cotton bales will have

- ❖ A unique RFID tag attached to each bale during the packing operation after a bale is pressed.
- ❖ RFID software and RFID reader and writer hardware will make available the following tag parameters:
  - **Mandatory Parameters :**  
Mandatory parameters (Press mark No, Year of manufacture, Lot number, Bale number and Weight) will be written during the tagging of bale.

- **Optional Quality Parameters :**  
Optional parameters (Grade, Variety, Fibre Length, Micronaire, %UR, Trash and Moisture) can be updated at the online centralized database by G & P units after the bale is tagged and dispatched.
  
- ❖ The centralized online database of bales produced in the country will be made available for statistical analysis. Authorized access mechanism will be provided to obtain reports such as “Total number of bales produced in given year” and “Bales produced in a particular region” etc. The centralized online database consists of all confirmed entries made by individual ginner using RFID hardware and software system provided for bale tagging application.

#### **Benefits of RFID Bale Tagging and Management**

Bale tagging and tracking is not yet practiced by the cotton industry in India. This is to initiate the standard bale tagging practices followed in other leading cotton-producing countries. Mills randomly draw samples and check fibre qualities of few bales from a lot. HVI data for every bale is a prerequisite as it greatly reduces risks related to unexpected reductions in mill and product performance. Hence implementing trading of bales with fibre quality information will be very much useful to its end users. Also it is difficult to draw accurate figure on the total bale production in the country. Implementing bale tagging and centralized online record keeping will ease bale transactions and assist in organizing bale production information. It will give first hand information to the policy making authority of the country.

## RFID Tagging and Record Keeping of Bale Information at G & P Units

**SSPS - Bale Management Module** \_ □ ×

Bale Information Details

TAG ID

	Mill	Year	Lot No.	Bale No.
SERIAL NUMBER:	AP123	2011	1234	497

VARIETY:  GRADE:

WEIGHT:  Kgs

SPAN Length:  mm

UR:  %

TENACITY:  g/t

MIC:

Tag_id	Year	Mill	LotNo	BaleNo	Variety	Weight	Grade	SpanLength	UR	MIC	Tenacity
49573843	2011	AP123	1234	284	BRAHMA	170.00	Super	32.00	43	4.00	27.20
A717F643	2011	AP123	1234	299	A.Comilla	171.00	Super	32.50	44	3.90	22.00
700FAB2B	2011	AP123	1234	290	A.Comilla	156.00	Super	23.00	47	3.00	25.00
B4CB2683	2011	AP123	1234	303	DCH32	170.00	FAQ	32.20	47	3.30	23.00
7409CF9B	2011	AP123	1234	297	DCH32	171.00	Fair	32.40	47	4.10	23.10
740740BB	2011	AP123	1234	294	BANNI	171.00	FAQ	32.40	47	4.40	23.50
7405B61B	2011	AP123	1234	293	AKH4	170.55	Fair	31.10	44	3.90	26.40
7409A52B	2011	AP123	1234	296	BRAHMA	170.00	Fair	29.40	42	4.70	26.80
7409A24B	2011	AP123	1234	295	AGETI	170.00	FAQ	30.00	41	4.00	26.00
5E88A37B	2011	AP123	1234	288	BRAHMA	171.22	Kawadi	32.00	42	6.00	24.00
70149EFB	2011	AP123	1234	292	AKH4	170.98	Fair	30.00	44	4.00	28.00
701308CB	2011	AP123	1234	291	AKH4	172.00	Fair	31.10	42	4.00	26.00
B4CBD2...	2011	AP123	1234	304	AKH4	171.00	Fair	20.10	46	5.00	20.10
A5BC4326	2011	AP123	1234	298	A.Comilla	165.50	Super	22.20	44	4.50	22.50
B4537DC5	2011	AP123	1234	302	A.Comilla	169.20	Fair	21.50	43	4.25	22.70
C34567A6	2011	AP123	1234	305	A.Comilla	166.30	Kawadi	24.50	43	5.00	22.90
53421AB4	2011	AP123	1234	285	A.Comilla	169.45	Kawadi	23.75	42	3.95	23.10
2678CA42	2011	AP123	1234	277	A.Comilla	167.60	Super	24.57	46	4.25	24.20
42367BC0	2011	AP123	1234	282	BRAHMA	170.20	Super	25.20	44	4.15	22.25
6543ECA7	2011	Ap123	1234	289	BRAHMA	168.40	Fair	26.75	43	5.15	23.45
5E88A37B	2011	AP123	1234	287	A.Comilla	165.00	Super	23.00	47	6.10	22.00

## Online Login and Search for Cotton Bale Production and Availability

**Search Criteria**


Mill  Tag Id  Year  Lot Number

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Variety  Grade  Span Length(mm)  UR(%)  Tenacity(g/t)

**Search results**

SerialNo	Tag Id	Mill	Year	LotNo	BaleNo	Variety	Weight	Grade	SpanLength	UR	MFC
491	197AC140	AP123	2011	1234	496	DCH32	170.40	FAQ	23.50	43	4.25
490	A978C140	AP123	2011	1234	495	DCH32	167.60	Super	24.57	46	4.25
489	1A421AC4	AP123	2011	1234	494	DCH32	169.45	Kawadi	23.75	40	3.95
488	2610CA42	AP123	2011	1234	493	DCH32	171.60	Super	24.57	46	4.25
487	53001AB4	AP123	2011	1234	492	DCH32	169.45	Kawadi	23.75	42	3.95
486	C345B1A6	AP123	2011	1234	491	DCH32	170.30	FAQ	24.50	43	5.10
485	B4512DC5	AP123	2011	1234	490	DCH32	168.20	Fair	21.60	41	4.25
426	469BD56B	AP123	2011	1234	431	DCH32	169.10	Super	27.15	46	3.10
425	457AD56A	AP123	2011	1234	430	DCH32	170.80	Super	27.25	45	3.00
424	447CD34A	AP123	2011	1234	429	DCH32	169.25	Super	33.00	48	2.90
423	4367AD91	AP123	2011	1234	428	DCH32	170.10	FAQ	27.25	42	5.20
422	4262CD90	AP123	2011	1234	427	DCH32	171.50	Fair	26.25	45	4.20
421	4167CD36	AP123	2011	1234	426	DCH32	168.60	Super	27.45	46	5.10
420	407ACD51	AP123	2011	1234	425	DCH32	170.20	Kawadi	27.25	43	5.00
419	56A7CD54	AP123	2011	1234	424	DCH32	169.20	FAQ	28.25	44	4.00
418	576ACD87	AP123	2011	1234	423	DCH32	170.70	Fair	27.25	46	3.00



### Indian Cotton Bale Management









Total No. Of Bales : 226

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**Sign In**

Username

Password

- Download Ginning Mill RFID Software
- Total Bale Data Security
- View and Retrieve Data of Current and Previous 5 Years
- Choice of Reading Writing and Posting Data from PC or Hand Held RF Readers
- 24/7 Call Center and Online Support

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