Primepack Containers Pvt. Ltd.
– String up failure and its Cost

We recognize that, yarn transfer failure or AUTO DOFF failure can be a huge expense for our customers. The yarn transfer efficiency greatly depends on the quality and consistency of tubes. At Primepack we follow a stringent mechanism for qualification and selection of tubes which in turn leads to our high String up efficiency of 99.5% - dramatically reducing the process wastage of yarn. The tubes from Primepack provide high transfer efficiency due to our stringent guidelines for dimensional consistency, correct groove design and optimum crush strength.

Yarn Transfer Failure:

Here we study a high-level calculation of costs resulting from yarn transfer failures. Once the yarn does not get caught in the tube, due to the nature of continuous process manufacturing, the resultant time wasted in manually changing the tubes leads to the following wastages:

- Time wastage in manually changing the tubes on the winders.
- Yarn wastage during the time when winders have stopped.
- Opportunity loss – wasted yarn cannot be sold.
- Manual labour cost to change the tubes on the winders.
- Manual labour cost to scrap the wasted yarn.

Cost head	Units	Amount	Description
Manual String up time	Min	15	Time taken to manually change the tubes
Yarn manufacturing Cost per kg	INR/kg	₹ 150	Cost of manufacturing yarn per kg
Throughput	(Kg / hour)	25	Yarn manufactured per hour (in kg)
Labor rate	INR/hour	100	Cost of manual labour
Number of Labour	Count/Number	1	Number of labour required
Number of tubes/winder	Count/Number	5	Number of tubes per winder
Tube cost	INR	₹ 60	Cost per tube
Yarn Waste recovery/Kg	INR/Kg	₹ 3	Cost of waste yarn
Yarn Waste	INR	₹ 938	Manufacturing cost wastage due to winding being shut for 15 mins
Labor Cost	INR	₹ 25	Labour Cost to change the tubes on the winder
Opportunity Cost	INR	₹ 1,125	Wasted yarn that could not be sold
Tube waste Cost	INR	₹ 60	Wasted tube cost
Yarn waste disposal cost		₹ 33	Cost to dispose the yarn in appropriate scrap yard
Yarn waste recovery		₹ -19	Cost recovered on selling waste yarn
Failures per day	Count/Number	2	Assuming 2 tubes fail auto doff transfer
Total	INR	₹ 2,162	Cost per failure
Total per day	INR	₹ 4,324	Cost per day
Total per year	INR	**₹ 15,78,321**	**Cost per year**

The above costs of Rs.4324 per day are assuming only 2 such failures occur in a day. With an average failure rate of 2 tubes per day, in a year such failures can cost a company up to INR 1.5 Million in the Indian context (labour rates , manufacturing costs , scrap costs etc. as per Indian standards). With the constant increase in the labour rates, updated machinery which increases yarn throughput, higher winder speeds etc, this cost is bound to increase at an exponential rate.

Shown below is the calculation of higher yarn transfer failures – keeping all other parameters same.

Cost head	Units	Amount
Manual String up time	Min	15
Yarn manufacturing Cost per kg	INR/kg	₹ 150
Throughput	(Kg / hour)	25
Labor rate	INR/hour	100
Number of Labour	Count/Number	1
Number of tubes/winder	Count/Number	5
Tube cost	INR	₹ 60
Yarn Waste recovery/Kg	INR/Kg	₹ 3
Yarn Waste	INR	₹ 938
Labor Cost	INR	₹ 25
Opportunity Cost	INR	₹ 1,125
Tube waste Cost	INR	₹ 60
Yarn waste disposal cost		₹ 33
Yarn waste recovery		₹ -19
Failures per day	**Count/Number**	**3**
Total	INR	₹ 2,162
Total per day	INR	₹ 6,486
Total per year	INR	**₹ 23,67,481**

Cost head	Units	Amount
Manual String up time	Min	15
Yarn manufacturing Cost per kg	INR/kg	₹ 150
Throughput	(Kg / hour)	25
Labor rate	INR/hour	100
Number of Labour	Count/Number	1
Number of tubes/winder	Count/Number	5
Tube cost	INR	₹ 60
Yarn Waste recovery/Kg	INR/Kg	₹ 3
Yarn Waste	INR	₹ 938
Labor Cost	INR	₹ 25
Opportunity Cost	INR	₹ 1,125
Tube waste Cost	INR	₹ 60
Yarn waste disposal cost		₹ 33
Yarn waste recovery		₹ -19
Failures per day	**Count/Number**	**4**
Total	INR	₹ 2,162
Total per day	INR	₹ 8,648
Total per year	INR	**₹ 31,56,642**

The cost of yarn transfer failure can be a tremendous burden on our customers. In our experience, seen above, the cost of a single failure can be more than 80-100 times the cost of a single tube. The annual cost of such a failure in the Indian context can be as high as INR 15 to 30 Lakhs per position per WINDER. It is therefore the highest obligation of Primepack that our knowledge, expertise, tools, and processes culminate in the highest standard of tubes with industry leading string up efficiencies.

CORE Selection

A commitment to producing the highest quality finished product should be at the heart of every successful converting equipment. But the ability to deliver on that promise may literally rest with its CORE. The same fundamentals of yarn transfer failures are applicable to some extent to failure of the Core as well. Thus, while the core's cost may represent a fraction of the film's value, it can greatly affect that value in terms of total yield from the roll. Failure of the core to perform properly during winding, transportation or un-winding can jeopardize thousands of rupees worth of product. The roll performance is enhanced using the right core and the core characteristics.

Mitigation of tube / core failure

Incoming raw material is procured from leading American OCC based vendors and is subjected to intense testing to ensure it is of the highest standards. We also focus on key tube/core parameters of finished products like "Surface, straightness, ovality, moisture content, flat crush strength, radial strength, dimensional consistency, dynamic load strength, grove/notch accuracy and end cut quality. Following are some key processes followed at Primepack:

- GO and NO-GO gauges are used for checking individual tubes to ensure correct and consistent length and OD. Weight of individual tubes is checked.
- Crush strength radial / flat is checked for production samples.
- Moisture is checked with respect to relative humidity.
- Primepack has in-depth expertise in developing custom knifes and toolsets based on the WINDER manufacturer designs and min/max Denier of yarn.

For more details on our Quality Control mechanisms, refer to "Quality at Primepack" on our website www.primepackcontainers.com.