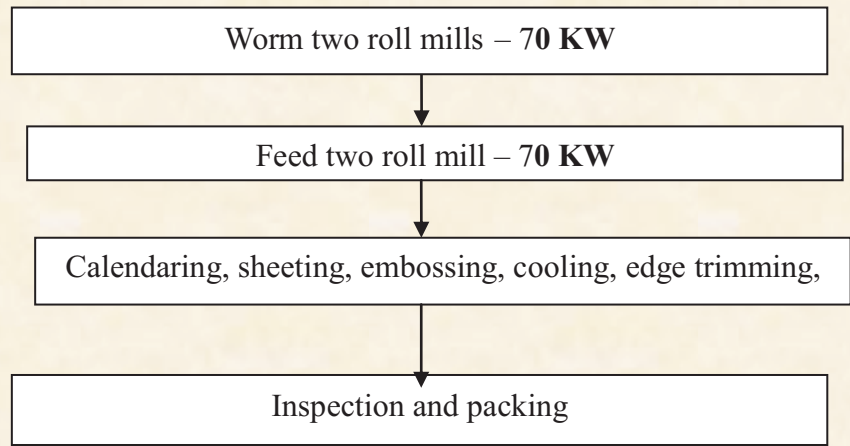


Intervening Technology/ Technique	Replacing DC Motors by VFD motors
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About the Industry	M/s. Om Vinyls Pvt. Ltd. Located at Valsad, Gujarat. Company is engaged in manufacturing of PVC films & sheeting and PVC leathercloth (Calendered, Coated & Foamed)
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Implemented Techniques/ Technology	<p>Before The PVC Calendaring line was mainly used to produce PVC films and Sheeting, either embossed or plain, either opaque or transparent, either very soft or rigid for uniform thickness and quality. The process starts with the weighing of ingredients (DC motors used) as per given formulation such as PVC Suspension grade Resin, Plasticizers like D.O.P., Chlorinated Paraffin Wax Filler / Extenders like Calcium Carbonate (Stearic Acid Coated) Hear Stabilizers Ba-CD complex or organotinmercaptides (Butylin, Octyltnemercaptide) or Calcium Zinc Stearates, Organic / inorganic Pigments, Lubricant like Stearic Acid Oxidized Polyethylene Wax etc. processing aids, epoxidised oil and blending the above in the high-speed mixer. This “Dry Blend” was weighted & loaded in to the plastificator or integral batch mixer (also called Banbury). The powder with the influence of shear between the (WigWig) conveyor with metal detector to pull out if any metal particles or an impurity from the feeding material and calendar consists of four large sized and sturdy rolls of exceptional surface finish. The rolls of calendar are heated by Thermic fluid at pressure of 3 kg/Sq. to attain temperature at around 200° C. The plastic mass was forced to pass between these rolls. The gap between those was adjusted to obtain the required thickness. The emerging film is strip from the last Roll of the Calendar and was made to pass between a metal engromed roll called Embossing roll and water cooled rubber roll.</p> <p>After New technology implemented VFD (Variable Frequency drive) motors to replacing by DC motors. It will replace by Four motors.</p> <p>Flow diagram of PVC</p> <div style="text-align: center;"> <pre> graph TD A[Weighing and mixing in powder form – 150 KW] --> B[Banbury / intensive batch mixer – 150 KW] </pre> </div>
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Note: In Figure, weighing and mixing, Banbury / intensive batch mixer, warm two roll mills, feed two roll mill here DC motors was used which is replaced by VFD motors.

VFD provides following Advantages:

- Energy savings
- Low motor starting current
- Simple installation
- High power factor
- Lower KVA
- Lower maintenance costs, as lower operating speeds result in longer
- life for bearings and motors.

Benefits

Economical

	Average
Production, tones/month	1060.19
Units consumed/month	362316.67
Units consumed/tonne of product	342.10

Motor Capacity	Current Technology units consumed/hr	After Implementation CP, units consumed/hr	Net saving of Units/hr
KW-150	225	191.25	33.75
KW-150	225	191.25	33.75
KW-70	105	89.25	15.75



KW-70	105	89.25	15.75
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Assuming that the plant works for 24 hrs. For 25 days a month, Total units saved per month, is $(33.75+15.75)*2*24*25 = 59400$

Average units consumed after implementing CP = $362318.67-59400 = 302918.67$ units

After implementing CP, the average units consumed per tonne of product produced

$$= 302918.67 / 1060.19$$

$$= 285.72$$

So, It can be concluded that the units consumed per tonne of product would reduce from 342.10 to 285.72 after replacing the current DC motors (150KW and 70 KW – 2 no. Each) by variable frequency drives.

Note: There may be 5-10% variation in the amounts as the values assumed for calculating the units consumed are for highest efficiency.

