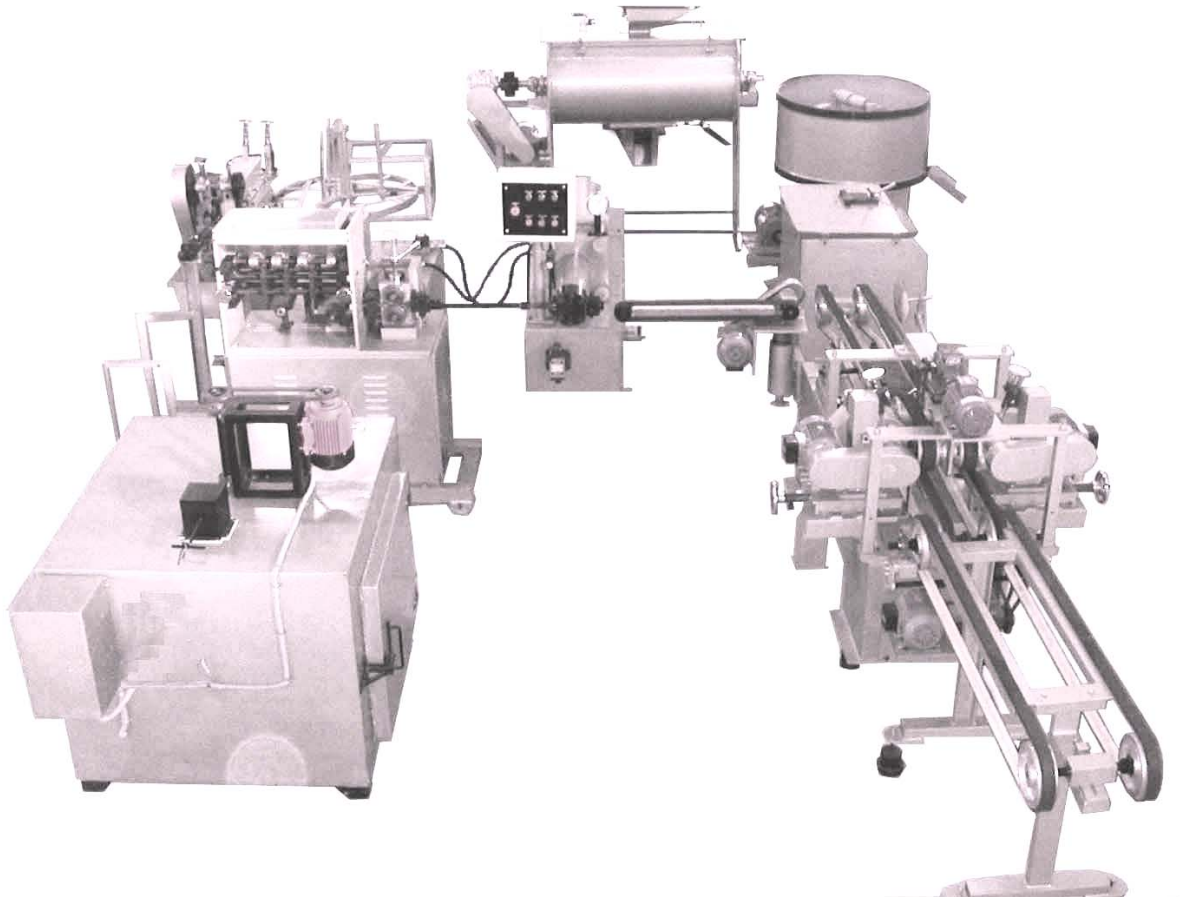




**BRIEF PROJECT PROFILE ON**  
**WELDING ELECTRODE**  
**MANUFACTURING**



**Turn key project suppliers**

**EUREKA SYSTEMS AND ELECTRODES PVT.LTD.**

**M A C H I N E R Y D I V I S I O N**

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## *Introduction*

*We introduce ourselves as a leading Welding Electrode Solution Provider right from Welding electrode Turn key projects to technology know-how. We have at our disposal the state of the art plant & machinery and technology for producing MMAW electrodes (like MS, SS, Cast-iron, Hard facing, Cutting and gouging and etc.) Ours is an ISO 9001-2000 Company managed by professionals to cater the needs of our global customers. We have a very good customer base almost from all the continents. We made this uphill task possible by virtue of our customer support and our effort, skill and efficiency.*

## **Profile**

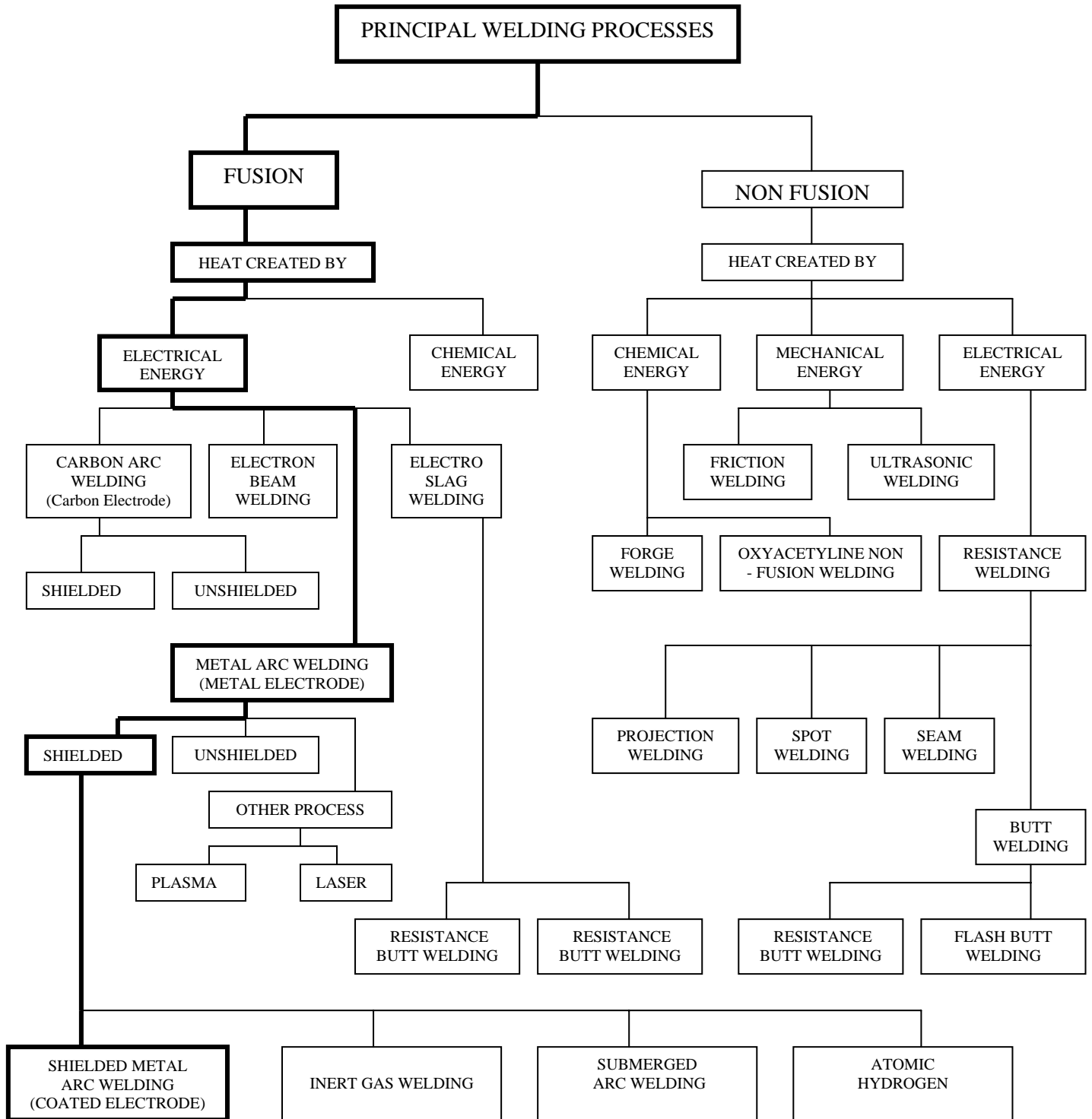
A group of young men under the stewardship of Mr. K.Chandrashekar and associate Mr. S.Ganesan, armed with years of technical experience in design, fabrication and commissioning of welding electrodes manufacturing machinery and systems, as well welding electrode itself, got together to take the technology to the common man. Eureka Systems was thus formed as a partnership company.

From partnership, Eureka Systems grew in to a private limited company in the year 1989. Entrepreneurs with proven talents and stalwarts in their respective fields like paper and textile exports found a common ground in contributing a sizable share of the venture capital and became directors. It was the beginning of the real growth of the company. Their unstinted support elevated Mr. K.Chandrashekar as Managing Director and Mr. S. Ganesan as Technical Director.

## **An over view on Welding Electrode Industry/Market**

Though welding electrode is a highly consumable industrial item, the success of this project depends on marketing, financial planning and production of quality electrodes.

The requirement of welding electrode is directly proportional to the steel production in any country. Electrodes are needed both in bulk and small quantity of production. The most important factor in marketing this product is consumer satisfaction and this can be achieved by producing good quality electrodes and selling at the most economical price with the best sales network. So it is you to decide the potential project which is at your door step to make you successful.



The above classification shows the position of the Shielded Metal Arc Welding (Coated Electrode) among various welding process.



## THE PROCESS

### 1. PREPARATION OF CORE WIRE

Electrode quality rimming wire conforming JIS 3503 SWRY 11 with low carbon and low silicon is available in the open market. The wire rod coils are converted to the drawn wire coils of sizes such as 2.5mm, 3.15mm, 4mm and 5mm at the wire drawing plants in house or on job-work basis. It is then straightened and cut in to required lengths by 'Straightening and Cutting Machine'.

### 2. PREPARATION OF DRY MIX

Rutile, Low carbon Ferro Manganese, Cellulose, Titanium Di-Oxide, Mica, Feldspar, quartz, etc., are some of the chemical powders used as the raw materials for the preparation of flux. These chemicals are available world wide and they are weighed accurately as per the technology for each type of electrodes and they are mixed in a dry mixer to get homogeneous mix or can be sourced from Eureka as a readymade flux.

### 3. PREPARATION OF THE WET MIX.

Potassium Silicate is used as the Binding agent. The flux is mixed with Silicate in a correct proportion to obtain a wet mix in a mixer. The Wet mix is then pressed to form a briquettes in a hydraulically operated press in order to load the flux in the flux cylinder of the extruder.

### 4. APPLICATION OF THE COATING BY EXTRUSION

The coating of flux is done by the extrusion press in which the flux fed through a cylinder under pressure. While the wire is fed from the wire magazine of the electrode press the briquettes are introduced into the extrusion cylinder of the press. During extrusion the core wire is fed one by one from wire feeder and coated with the flux by way of nozzle/die box system incorporated in the extrusion press. The electrodes coming out from the press are tested in an eccentricity tester.

The rejected electrodes are taken into the flux stripping machine where the flux is stripped off. The core wire and flux can be re-used.

The electrode coming out from the press is passed through a conveyor to the brushing machine for brushing of holding end and cleaning the same on tip end side for easy striking. After that the electrodes are spread on the collecting tray for air drying and after certain period they are fed into the oven.

### 5. BAKING OF COATED ELECTRODE

After air drying of the coated electrodes they are baked in oven. Depending on the type of electrode the baking cycle will vary. The moisture content in the electrode should not exceed 4 percent.



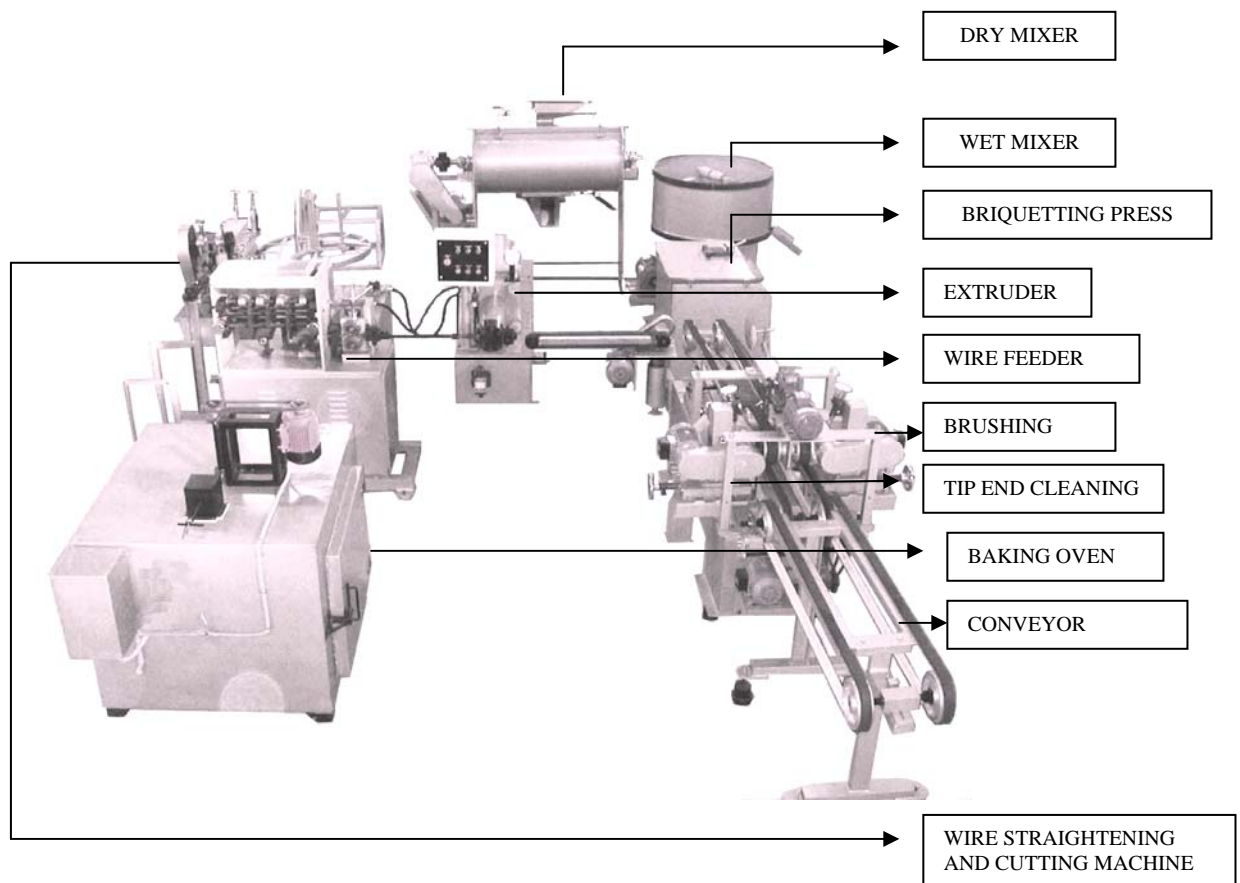
## 6. QUALITY CONTROL

Quality control in electrode making shop calls for, constant checking of the ground ingredients their proportioning and mixing, application procedures, moisture content and drying conditions. In addition, the chemical analysis of the core wire, powders and bonding materials are determined, the coating thickness is measured and the electrodes are tested on trail plates.

## 7. GRADING AND PACKING

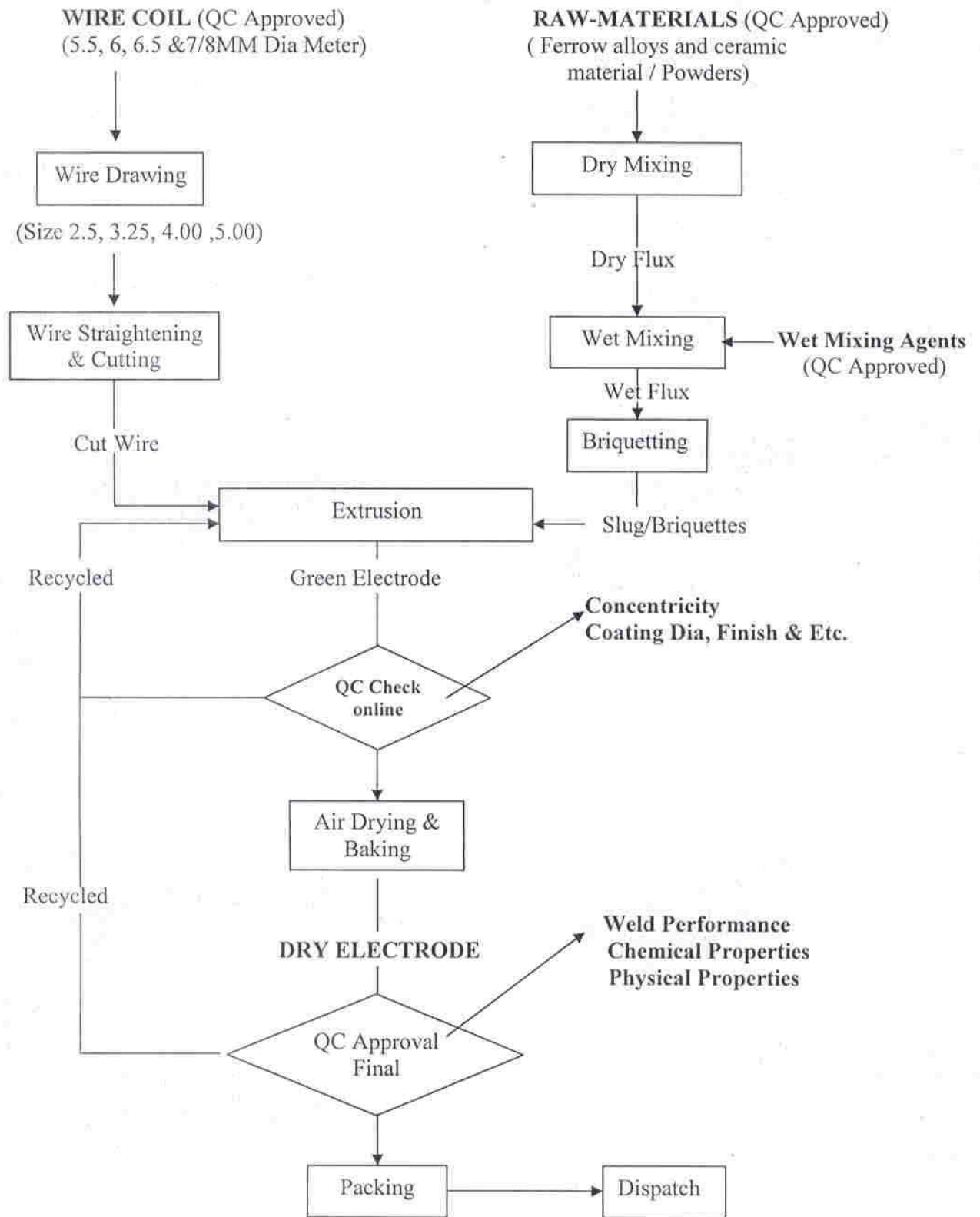
The finished electrodes are stored and wrapped in polythene or waxed paper and packed in cartons. Cartons are packed in master cartons as per requirement.

### The Model of an Electrode Plant and the Name of Machineries





## PROCESS FLOW CHART





## PLANT AND MACHINERIES REQUIRED

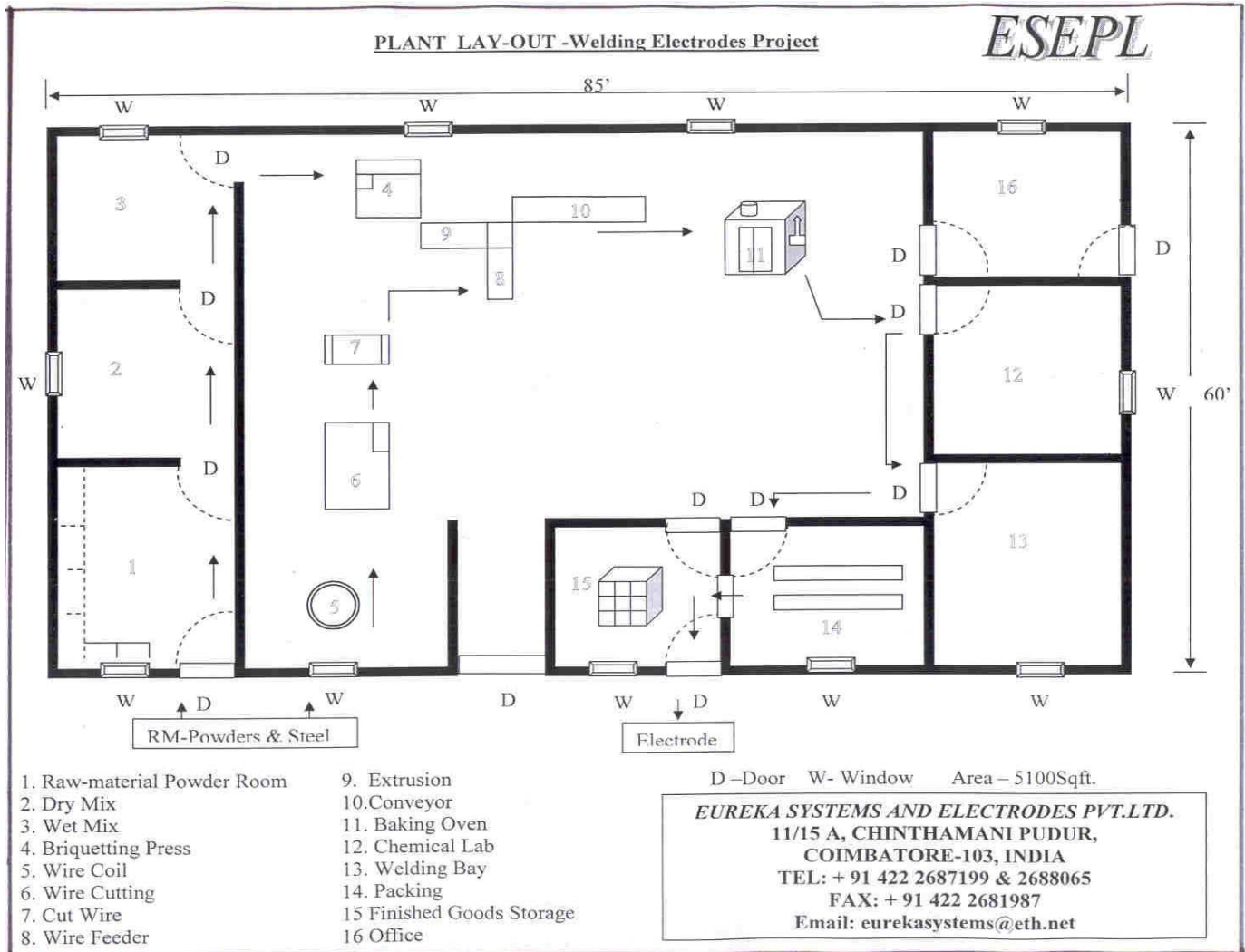
MACHINERIES	NOS/CAPACITY/HP/KW						
	1 MT	2MT	3MT	4MT	5MT	8MT	10MT
WIRE DRAWING MACHINE	Not feasible			1 X 160HP	1 x 160HP	2 X 160HP (320HP)	2 X 160HP (320HP)
DRY MIXER	1 X 500KG 5HP	1 X 500KG 5HP	1 X 750KG 7.5HP	1 X 1000KG 10HP	1 X 1000KG 10HP	2 X 1000KG 10HP (20HP)	2 X 1000KG 10HP (20HP)
WET MIXER	1 X 30KG 3HP	1 X 75KG 5HP	1 X 75KG 5HP	1X 100KG 7.5HP	1X 100KG 7.5HP	2 X 100KG 7.5HP (15HP)	2 X 100KG 7.5HP (15HP)
CUTTING AND STRAIGHTENING	1 X 120PCS 5HP	1 X 200PCS 8.5HP	2 X 200PCS 8.5HP (17HP)	3 X 200PCS 8.5HP (25.5HP)	3 X 200PCS 8.5HP (25.5HP)	4 X 200PCS 8.5HP (34HP)	5 X 200PCS 8.5HP (42.5HP)
BRIQUETTING PRESS	1 X 2HP	1 X 3HP	1 X 3HP	1 X 5HP	1 X 5HP	1 X 5 HP	2 X 5HP (10HP)
EXTRUSION PRESS (Wire feeder, Extruder & Conveyor)	1 X 10.5HP	1 X 13.75HP	1 X 15.5HP	1 X 20HP	1 X 22.5HP	1 X 30HP	2 X 22.5HP (45HP)
ELECTRODE NAME PRINTING UNIT	1 X 0.25HP	1 X 0.25HP	1 X 0.25HP	1 X 0.25HP	1 X 0.25HP	1 X 0.25HP	2 X 0.25HP (0.5HP)
CONCENTRICITY TESTER	1	1	1	1	1	1	2
BAKING OVEN	1 X 150°C 2HP 12KW	1 X 150°C 2HP 20 KW	1 X 150°C 3HP 26 KW	1 X 150°C 3HP 30 KW	1 X 150°C 3HP 30 KW	2 X 150°C 3HP 30 KW (6HP+ 60KW)	2 X 150°C 3HP 30 KW (6HP+ 60KW)
FLUX STRIPPING MACHINE	1 X 3HP	1 X 3HP	1 X 3HP	1 X 3HP	1 X 3HP	1 X 3HP	2 X 3HP (6HP)
PACKING TABLE	1	1	1	1	1	2	2
WEIGHING MACHINE	1 X 10 KG	1 X 10 KG	1 X 10 KG	1 X 10 KG	1 X 10KG	2 X 10KG	2 X 10KG
HAND SEALING PRESS	1	1	1	1	2	3	4
SHRINK PACKING MACHINE	1 X 9KW	1 X 9KW	1 X 9KW	1 X 12KW	1 X 12KW	2 X 9KW (18KW)	2 X 9KW (18KW)
STRAPPING MACHINE	1 X 0.25KW	1 X 0.25KW	1 X 0.25KW	1 X 0.25KW	1 X 0.25KW	2 X 0.25KW (0.5KW)	2 X 0.25KW (0.5KW)
CUT WIRE STAND	3	5	7	10	10	12	15
METAL TRAYS	300	400	500	800	1000	1600	2000
TOTAL HP AND KW REQUIRED	<b>31HP 21KW</b>	<b>40.75HP 29KW</b>	<b>51.5HP 29KW</b>	<b>235HP 39KW</b>	<b>237HP 39KW</b>	<b>434HP 78KW</b>	<b>471HP 78KW</b>

Additional Requirement (for handling and testing)- Optional)

MACHINERIES	NOS/CAPACITY/HP/KW						
	1 MT	2MT	3MT	4MT	5MT	8MT	10MT
PALLET TRUCK	1 X 2MT	1 X 2MT	1 X 2MT	1 X 2MT	1 X 2MT 1 X 5MT	1 X 2MT 1 X 5MT	1 X 2MT 1 X 5MT
WEIGHING MACHINE	1X300KG	1X300KG	1X300KG	1X300KG	1X300KG	1X300KG	1X300KG
CHEMICAL LABORATORY	1SET 15KW	1SET 15KW	1SET 15KW	1SET 15KW	1SET 15KW	1SET 15KW	1SET 15KW
PHYSICAL LAB	1SET 5HP	1SET 5HP	1SET 5HP	1SET 5HP	1SET 5HP	1SET 5HP	1SET 5HP
WELDING TRANSFORMER AC	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA
WELDING TRANSFORMER DC	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA	1X 21 KVA
MACHINE SHOP					1 SET 15HP	1SET 15HP	SET 15HP
TOTAL HP	5HP 57KW	5HP 57KW	5HP 57KW	5HP 57KW	20HP 57KW	20HP 57KW	20HP 57KW



## 1 MT PLANT LAYOUT



### LAND AND BUILDINGS

The land and building requirement depends on the capacity of the plant as well the facilities required.

Capacity	IN SQUARE FEET				
	For wire drawing	For Electrode conversion	Storage	Laboratory	Total
1MT	-	3000	1000	1000	5000
2MT	-	4000	2000	1000	7000
3MT	-	5000	3000	1000	9000
4MT	5000	6000	4000	1000	16000
5MT	6000	8000	5000	1000	20000
8MT	10000	10000	6000	1000	27000
10MT	12000	12000	6000	1000	31000





## MAN POWER REQUIREMENT

MAN POWER							
	1 MT	2MT	3MT	4MT	5MT	8MT	10MT
MANAGERIAL STAFF	1	1	1	2	3	3	3
SUPERVISORS		1	2	3	5	6	6
MAINTENANCE ENGINEER				1	1	2	2
FOREMAN				1	1	1	1
CHEMIST	1	1	1	1	1	1	1
TEST WELDER	1	1	1	1	1	2	2
SKILLED LABOUR	2	3	4	5	5	8	10
UNSKILLED LABOUR	6	7	8	9	10	14	18
<b>TOTAL</b>	<b>11</b>	<b>14</b>	<b>17</b>	<b>23</b>	<b>27</b>	<b>37</b>	<b>43</b>

## ELECTRIC POWER REQUIREMENT

MACHINERIES	HP/KW						
	1 MT	2MT	3MT	4MT	5MT	8MT	10MT
MAIN LINE MACHINERIES	31HP 21KW	40.75HP 29KW	51.5HP 29KW	235HP 39KW	237HP 39KW	434HP 78KW	471HP 78KW
ADDITIONAL REQUIREMENT	5HP 57KW	5HP 57KW	5HP 57KW	5HP 57KW	20HP 57KW	20HP 57KW	20HP 57KW
GENERAL LIGHTING	2000W	2500W	3000W	5000W	8000W	10000W	12000W
<b>TOTAL</b>	36HP 80KW	45.75HP 88.5KW	56.5HP 89KW	240HP 101KW	257HP 104KW	454HP 145KW	491HP 147KW

## OTHER REQUIREMENTS

**WATER** – FOR CIVIC AND UTILITY PURPOSES.

## RAW MATERIAL REQUIREMENT

The main raw material required for the project are Rimming Quality Steel, Rutile and other chemical such as Ferro Manganese, Silicate, China clay, Mica, Cellulose Titanium dioxide etc. They are available freely in the Global Market. The ingredients and the consumption ratio of the ingredients of each end every type of electrode varies. For example the ingredients and the consumption ratio of E 6013 type electrode shall be as follows.

**STEEL- ELECTRODE QUALITY WIRE (JIS 3503 SWRY 11) – 73%**

**MIXED FLUX - 25%** Readymade flux for each type of electrode is available at ‘EUREKA’ (Rutile, Ferro Alloys, Mica, China clay, Cellulose, Potash feldspar, Calcite, Quartz and etc.)

**BINDER- 2 %** (Potassium Silicate and Sodium Silicate)

The packing materials shall be taken as 5% of the total raw material cost.



**The above project is prepared in general. May change as per customers specific requirements.**

**We hope the above details are sufficient. Please don't hesitate to contact 'EUREKA' for more details and clarifications.**

**'THANK YOU AND ALL THE BEST'**

**Digitals of the Machinery**



**Wire Straightening and Cutting Machine**





**Dry Mixer**

**Wet Mixer**





**Briquetting Press**



**Wire Feeder**

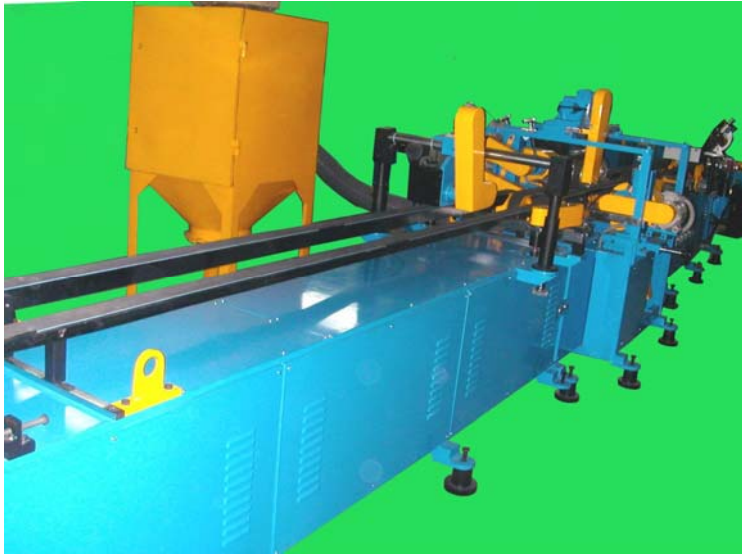


**Vertical Extruder**

**Horizontal Extruder**







**Conveyor**

**OVEN**



**Printing Unit**



**Digital of Functioning Plant**

