

Winding Machines For Electric Future

*Synthesis*  
Winding Technologies Pvt. Ltd.



- ✓ More than 700 man year of core industry experience.
- ✓ 10,000+ Successful installations with more than 150 custom built machines ( SPMs )
- ✓ Catered to more than 38 countries.
- ✓ 29 Years of Experience in working with industry leaders on various applications of winding.
- ✓ Extended support to refurbish / upgrade decade old equipment.
- ✓ Assured service support with in 48 hours in any part of the world by remote diagnostic facility.
- ✓ Smart machine: Industry 4.0 - Efficiency, flexibility, Productivity, connectivity, safety etc.



Commencement of delivering Engineered solution for Winding Industry



1993



Automatic solution for HT Capacitor Windings

1996



1<sup>st</sup> Indian Coil winding manufacturer to provide Indigenous solution for automatic 4 Axis winding machine

1999



1<sup>st</sup> Indian Manufacture to introduce Flyer type winding machine for magneto coil

2001

2005



Supplied largest Bushing winding machine for BHEL

2007



1<sup>st</sup> Indian Winding machine manufacturer to introduce automatic graded Layer winding technique for manufacturing transformers

2010



Technology breakthrough with throughput > 99%

2013



Introduction of Auto LV foil winding machine

2018



Celebrated glorious **25** Years of Manufacturing winding Machines with exports to 35 countries.

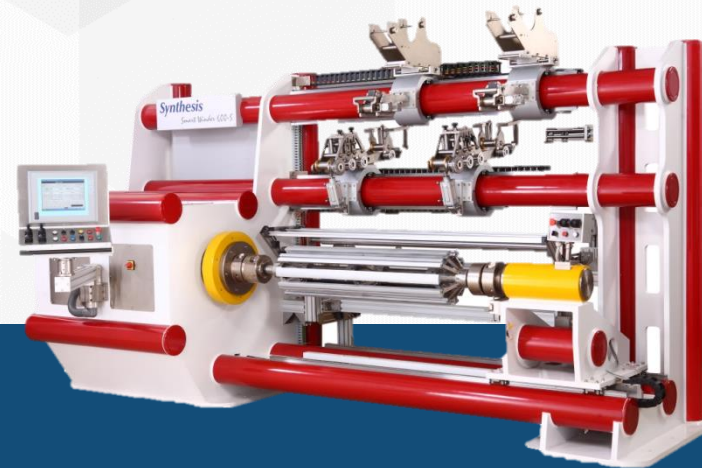
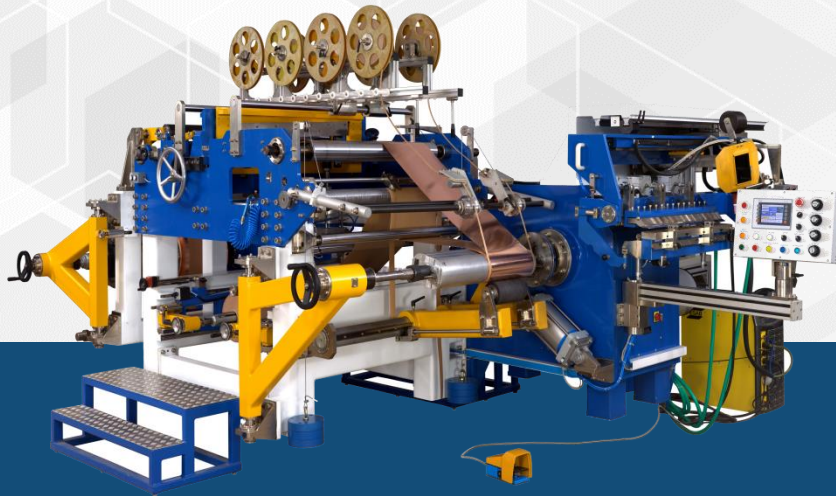
2022

Smart Winding Machine using Artificial Intelligence



# OUR CAPABILITIES

Single house solution provider & largest **Indigenous** manufacturer of Winding Machines

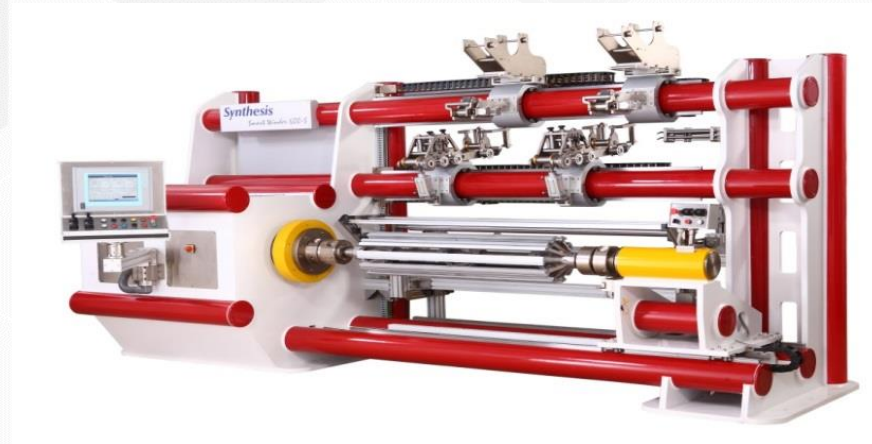




Single house solution provider & largest **Indigenous** manufacturer of Winding Machines



CONDENSER BUSHING WINDING MACHINES



TRACTION TRANSFORMER WINDING MACHINE



TRANSFORMER CORE TAPING MACHINE



CT LIMB TAPING MACHINES



# OUR CAPABILITIES Automatic Winding Machine with 32 Servo Axes









### Industrial Sectors Share



3% - Defense & Aerospace



5% - Others



7% - FMCG



25% - Electricals & Electronics



30% - Power & Distribution



30% - Auto Components

### Revenue Share

Domestic

60

Overseas

40





Being a **Differentiator** by providing a **single roof solution** with a vast product portfolio for the Winding Industry.





Synthesis is the **FIRST Indian Company** to develop **Stator Winding Machines** in India way back in 2001.

**95%** of Two wheeler vehicles manufactured in India contains Magneto Coil produced on Synthesis Winding Machines

### Benefits for the Indian Auto Industry

The dependency of Indian Auto Industry on imported machines has substantially reduced

The Industry could produce very complex Magnetos with exceptional ease.

The quality of component at Par with Global Standards, this opened opportunities to export.

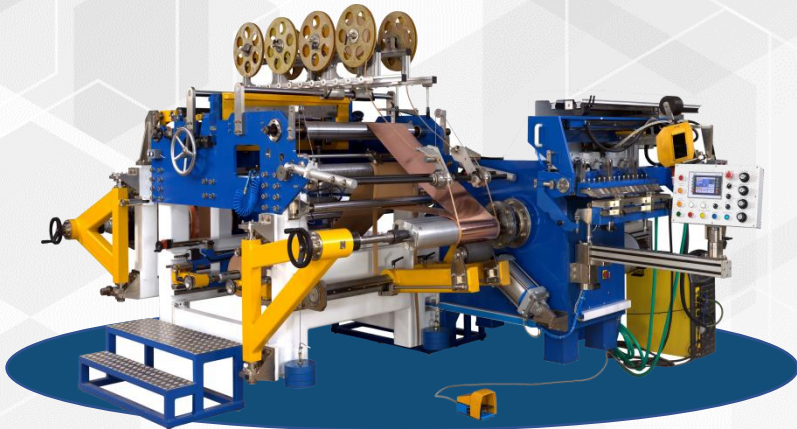
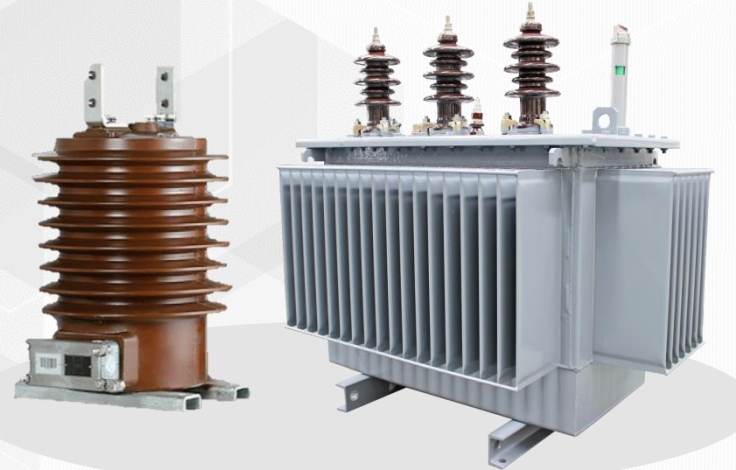
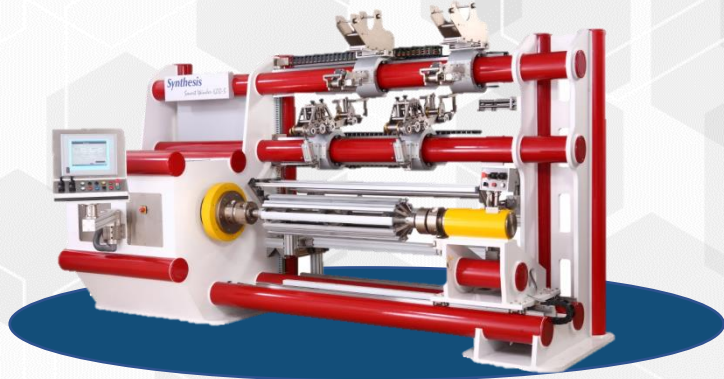
Eliminated dependency on human skills, achieved high productivity and brought manufacturing cost significantly down.



Our Clientele List - TOP Brands in Auto Electrical Components like *DENSO, Yamaha, Mitsuba, Ducati India, HONDA Power Products, Lucas, INEL, Varroc Engineering*



Being a **Differentiator** by providing a **single roof solution** with a vast product portfolio for the Winding Industry.





## Technology Transformation in Capacitor Industry

## Components produced using this machine





## Technology Transformation in Capacitor Industry



### Triggering point in the industry:

High component rejection rate of 30-35%, which are due to tab displacement, foil length, wrinkles on the foil. Due to this manufacturers undergo huge material loss.



### Technology developed:

Algorithms developed to forecast the errors on actual part & apply correction.

Adaptive servo tension control by delivering precise tension to handle delicate foils and insulation of less than 5 microns thickness to wind without any wrinkle on the foil.

Increased line speeds up to 2.5 m/s with high accuracy.



### Achievement:

Through put achieved – 99.8%



### Outcome:

Increase in market share from 20% to 50%

Attained close to 100% market share in Europe, since 2013

Business opportunities to America & China



## Technology Transformation in Transformer Industry



## Components produced using this machine





## Technology Transformation in Transformer Industry



### Triggering point in the industry:

Use of foreign materials like glue or tape to stick paper on the coil. More operator intervention, higher cycle times, reduced productivity, no automation availability.



### Technology developed:

Incorporation of automatic stitching design



### Achievement:

Increase in Through put – 15%



### Outcome:

Solution for automation  
Improved cycle time  
No operator fatigue.





## Value Added Solutions to Automotive Industry

### Process Limitations:

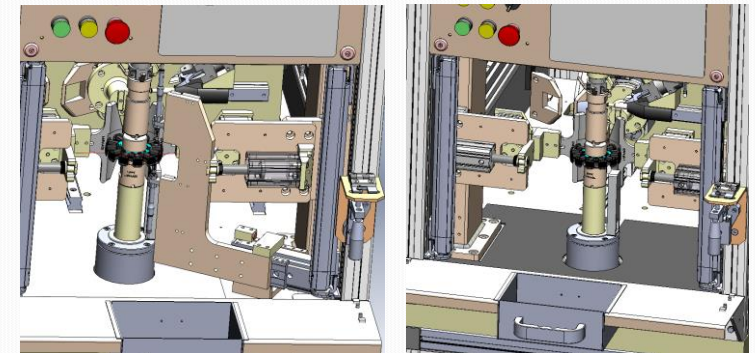
Powder coating process leads to uncontrolled dimensions of stack height. This creates uneven layer winding.

### Solution :

The height of the stack is measured & compensated using combination of Torque & Position control in servo system with Tooling reference.

### Outcome:

100% core utilizations & Improved winding quality.





## Value Added Solutions to Capacitor Industry

### Process Limitations:

Handling, Connecting & Stacking of elements was cumbersome & critical to address

### Solution :

Developed completely automatic graded capacitor element line with Ultrasonic welding and auto stacking of Elements.

### Outcome:

100% elimination of Manual Intervention.





## Value Added Solutions to Power (T & D) Industry

Developed 12.5 mtr bushing winding machine, this machine designed to wind bushings for 1200 kV line testing, such Ultra high voltage testing was done for the 1<sup>st</sup> time in India.





With the **current need for the energy conservation**, there is a surge in the market wherein the **Industry Started finding use of Brushless DC Motors** in various applications like – Automobile Sector (EV Motors), Home Appliances & Various other Industrial Applications

In the prevailing scenario, there emerged need of Automatic NEEDLE WINDER machine for which in INDIA as of now there is no manufacturer available

Again, the Industry in INDIA would have to depend for machines from Europe, US, Japan and mainly from China / Taiwan.

Identifying this NEED, Synthesis has now Embarked on developing Winding Machine using Needle type technology for BLDC Stators.









90%

Automatic Stator Winding Machines- market share in India



50%

Automatic capacitor winding machine having market share globally



40%

Programmable Semi-Automatic Coil Winding Machine in domestic market



20%

Automatic CNC Multi-spindle Winding Machines as a indigenous manufacturer having competition with global manufacturer.







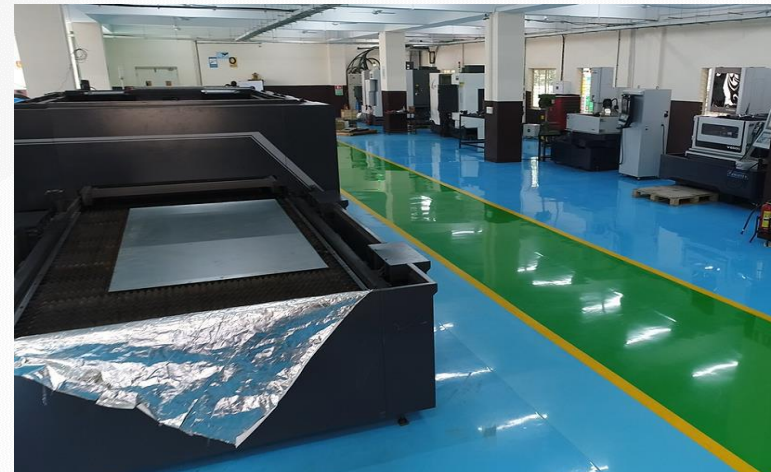








**SYNTHESIS - Tool room facility**



**ELCIA cluster (Co-owned) – Multi machining facility**

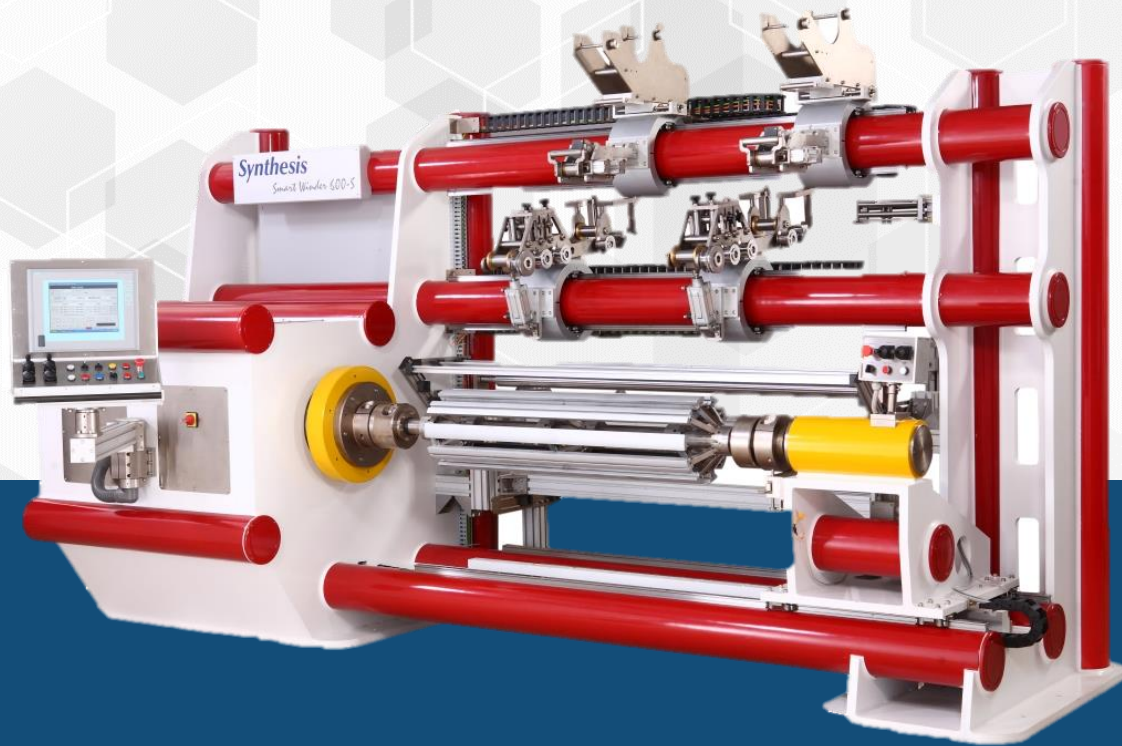













# THANK YOU

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***Synthesis***  
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