Training to support manufacturing & research

Remote training

RF-Plasma interaction

Ref. EL313 16 hours, including 12 hours of virtual classes

LEARNING OBJECTIVES

Understand how plasma (physical chemistry parameters) and RF energy source (hardware) interact with one another.
Adjust process parameters according to the equipment tolerance.
By the end of the training, participants will create or correct recipes with the understanding of their limits thresholds within the RF network.

PROGRAM

Individual e-learning start-up activities 2- 3 hours

Powerpoint course to start exploring the topic and quiz on RF and RF security.

First live virtual class with the trainer – 3 hours

Introduction: why this aspect "interaction" is important

1. Prerequisites

Reminder of the different dimensions in electronics that are essential for the remainder of the course.

2. RF environment and constraints

RF losses root causes and impact on Energy transferred to the process.

Second virtual classroom – 3 hours

3. Plasma environment and constraints

Interactions of PIDs and RF regulation loops on the plasma behavior and stability
How to get closer to the process using the tool sensors and the monitoring of plasma parameters.

4. Impedance adaptation

Theoretical module which covers the issues of energy transfer in Radiofrequency, the concept of reflected power, and the use of the Smith chart.

Individual training activities -2 hours

Exercises (calculations) of RF voltage and current, the skin effect, quality factor, etc.

Third virtual classroom – 3 hours

5. RF Match

The key to energy transfer, detailed view of the different models and design choices.
Implementation of energy transfer issues for high RF currents, etc.

6. RF generator

Detailed analysis of the components of an RF generator.
Fault analysis.
Specification analysis.

Theoretical exercises and diagnosis - 2 hours

IC frequency calculations, faulty plasma ignition, etch rate fault

Fourth virtual classroom – 3 hours

7. RF Cables

Theory, issues, cable choice, power resistance and cut-off frequency.

8. Metrology and diagnosis

Highlighting of the effects and limitations due to high frequency currents and materials.

7. RF microwave generator

Cavity magnetron preventive maintenance

8. Metrology and diagnosis

WHO WILL BENEFIT MOST?

Process and maintenance staff

INNOVATIVE TEACHING RESOURCES

This course was developed to bring together process and maintenance staff to understand RF related issues in order to allow these teams to discuss this subject in a forum.
Lectures and «hands-on» exercises.
Custom training manual.
Prior interview with the trainees possible in order to qualify their needs.
Multiple choice questions at the start and end of the training.
Each session is limited to 6 trainees.

IN CHARGE OF THE TRAINING SESSION

Tarek BELLADJ: Engineer in electronics and microelectronics, frequencies and microwaves; He has developed the industrial Radiofrequency activity in the 40-30 Provence region since 2006. He is qualified as a trainer and has more than 10 years of experience.

DATES

The virtual classes are every morning - from 20 to 23 April 2021 and include 4 hours of exercises (theoretical calculations and diagnostics) in autonomy.

The virtual classes are every morning - from 18 to 21 May 2021 and include 4 hours of exercises (theoretical calculations and diagnostics) in autonomy.

Sessions open from 4 registered participants and limited to 6 participants.

PRICE

1104 € ex.VAT
992 € ex.VAT from two people registered for the same session.
On quotation for a training course specific to your company

Contact : sales Service // ***tel. +33 (0)4 76 84 40 30*** // *supp-comm@40-30.fr* // *www.40-30.com*

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