KEYLINK Technology

Job Description: Plasma & Corona Surface Treatment Systems Engineer

Position: Plasma & Corona Surface Systems Engineer

Department: R&D / Engineering

Location: Wenzhou, China

Type: Full-Time

Role Overview

We are looking for a skilled engineer to join our R&D team to design, develop, and optimize **industrial Plasma and Corona surface treatment systems** used for plastics, films, metals, composites, and specialty materials. The ideal candidate has experience in high-voltage engineering, plasma discharge technology, machinery development, and automation.

This role involves conceptual design, prototype development, testing, and support for production-scale systems.

Key Responsibilities

1. System Design & Development

- Design and develop **Corona Surface Treatment** systems:
  - HV power generators (5–30 kV AC, HF 20–40 kHz)
  - Electrode assemblies (metal, ceramic, covered roll)
  - Ozone extraction and dielectric modules
- Design **Atmospheric Plasma Treatment** systems:
  - Jet/plasma nozzle design
  - Electrode and discharge chamber design
  - Gas distribution (air, nitrogen, argon, additives)
  - High-frequency HV plasma power supplies

2. Electrical & High-Voltage Engineering

- Design HV electrical circuits for both corona and plasma systems.
- Analyze discharge characteristics, impedance, and power distribution.
- Ensure safe operation and compliance with standards (CE, UL, ISO).
- Select key components: transformers, IGBT modules, HV capacitors, dielectric layers.

3. Mechanical & Thermal Design

- Design mechanical structures for treaters, plasma heads, housings, brackets, and cooling systems.
- Perform thermal simulations for plasma jets and electrode assemblies.
- Ensure stable gap distance, uniform treatment, and optimized airflow.

4. Process Engineering & Material Treatment

- Establish treatment parameters:
  - Power density
  - Line speed
  - Plasma exposure time
  - Electrode/nozzle gap
  - Treatment uniformity
- Measure surface energy, dyne levels, and adhesion performance.
- Test and validate treatment performance across substrates (PE, PP, PET, PU, metal foils, 3D parts).

5. Controls & Automation

- Develop integration with PLC/HMI systems (Siemens/Omron/Mitsubishi).
- Implement safety interlocks, sensors, power control loops, and diagnostics.
- Support communication protocols: Ethernet/IP, Modbus, Profibus, OPC-UA.

6. Prototype Testing & Validation

- Build prototypes and conduct:
  - Corona discharge tests
  - Plasma jet characterization
  - Surface energy measurements
  - Ozone & gas flow analysis
- Optimize system efficiency and long-term reliability.

7. Documentation & Compliance

- Produce CAD drawings, schematics, BOMs, test reports, and user manuals.
- Support CE, UL, ISO, and electrical safety certifications.

8. Cross-Functional Support

- Work with manufacturing and QC teams to transition designs into production.
- Collaborate with sales & application teams for customer trials and demos.
- Provide technical support during installation or troubleshooting (optional travel).

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Required Qualifications

- Bachelor's degree or higher in **Electrical Engineering, Mechanical Engineering, Mechatronics, Plasma Engineering, Physics, or related discipline**.
- 2+ years of experience in:
  - Plasma systems (atmospheric or low pressure)
  - Corona treaters or high-voltage equipment
  - Industrial automation or machine design
- Proficiency in CAD and engineering tools (SolidWorks, AutoCAD, ANSYS, COMSOL preferred).
- Strong understanding of:
  - High-voltage AC & HF circuits
  - Dielectric materials and breakdown physics
  - Plasma discharge principles
  - Ozone and gas flow safety

Preferred Qualifications

- Experience with atmospheric plasma jets or plasma torches.
- Familiar with RF/HF HV generators (20–300 kHz).
- Knowledge of polymer surface chemistry and adhesion science.
- Experience with surface tension testing and dyne solutions.
- Familiarity with standards (IEC 60204, ISO 13849, UL 61010).
- Manufacturing experience in high-voltage or plasma-based equipment.

Soft Skills

- Excellent problem-solving and analytical skills.
- Strong communication and cross-functional collaboration.
- Ability to manage multiple projects simultaneously.
- Hands-on, practical approach to testing and prototype building.

Performance Indicators

- Treatment performance (dyne level consistency, uniformity).
- Reliability and lifetime of corona/plasma systems.
- Successful prototype development and on-time project execution.
- Reduced power consumption and improved efficiency.
- Quality of documentation and customer feedback.