



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

be constructed from a non-rusting material, and should be viewable from the outside. The chamber will need to meet the requirements of several industry test specifications, but for now the basic requirements will be that the device under test (“DUT”) will need to be rotated slowly (0-5 rpm) in a high-pressure spray (<2000 psi) from 1-4 selectable nozzles at preset angles of attack. The distance from the nozzles to the DUT needs to adjust from 6” to 18”. Various test parameters must be set and monitored, including water flow rate, water pressure, number of cycles, and temperature. The steps of the test should be able to be programmed in sequence using automated valves, for example nozzle 1, then 2, then 3, then 4, or all 4 at the same time. Programming and monitoring should be performed via a User Interface display on the unit. The spray water must be completely captured, possibly re-used.

High-pressure cold or hot (tap water temperature up to 93°C) water will be supplied by a commercial electrically-heated pressure washer, attached externally and remotely due to safety regulations. Although outside the scope of this project, specifications for this pressure washer can be worked on. Full definition of the utilities, space and interfaces will be provided at the Kickoff meeting.

The final product should be as aesthetically pleasing as possible, to be showcased in a laboratory. It would be desired to continue to use the product in the Test laboratory, so additional cost beyond the \$3000 budget is expected to make something that lasts. For the cost >\$3000, Sponsor with supply the material or provide additional funding.

Expected Deliverables/Results:

Deliverables will include the proposed design for approval, user documentation, any source code, and the finished chamber.

Disposition of Deliverables at the End of the Project:

Provide pickup location and date for the TE Traffic department to arrange shipping.

List here any specific skills, requirements, knowledge needed or suggested (If none please state none):

- Hydraulics (flow/pressure/etc. calculations)
- Likely PLC based, but don't be limited by that.
- Travel required to client site for data gathering and Design Reviews. Travel costs will be re-imbursed from Project budget.