



## Inventors

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## Intellectual Property

### **Status:**

Patent Pending

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## Nanoparticle Photocatalyzed Throughflow Degradation Reactor (NPTDR)

AzTE Case # M13-056P

### **Background**

In the United States, industrial waste is regulated by the Environmental Protection Agency which limits the amount of waste being dumped into our national rivers and streams. Other countries do not have the high level of environmental regulations as North America. Although many industries produce waste, the textile industries in foreign developing countries are major polluters because they dump dyes into rivers that are harmful to the streams ecosystem. Many of these dyes are carcinogenic, and they are pumped out of the streams' onto water crops.

### **Invention Description**

Researchers at Arizona State University have designed a low cost, low energy system to remove industrial waste from water. A prototype has been built and has proven to be effective in removing methylene blue and methylene red. The process uses solar activated titanium dioxide as a catalyst for a chemical reaction that purifies water. However, other materials could be used as a catalyst, allowing the innovation to be effective in removing other chemicals as well.

### **Potential Applications**

- Textile Industry
- Agricultural Industry
- Electronics Industry

### **Benefits and Advantages**

- **Lower Costs** – Uses inexpensive equipment with low maintenance costs.
- **Solar Power** – No cost for electricity to operate. Uses the power of the sun.
- **Retrofit** – Can be easily installed in existing manufacturing processes.