

**New York State  
Environmental Investment Program  
Research Project Summary  
United Materials International**

**Project Background**

United Materials International, Buffalo, was formed in 2004 to find ways to improve material processing and finishing technologies, particularly for metallic products, parts and particles.

Water-jet cutting of metals using garnet abrasives is the fastest growing major machine tool sector in the world, as it is rapidly replacing more expensive, energy-intensive laser and plasma cutting systems. However, garnet abrasive jet cutting generates significant amounts of industrial waste because the garnet is brittle and breaks apart upon impact, and cannot be cost-effectively reused. Thousands of tons of contaminated garnet waste are discarded into New York landfills annually.

**Project Description**

This project was undertaken to analyze various methods for producing and classifying metallic particles using an ultra high-pressure abrasive jet process in the hopes of developing a water-jet system mixed with metallic particles for industrial cutting that could compete with garnet abrasives, but also assure recovery and reuse of the blast media.

The approach of the new technology analyzed in this project was to cut metals with metal abrasive jets. This would allow for a waste free approach, as all of the particles captured after use would be metals that could be recycled or reused. The process also produced interesting and potentially valuable metal nano-particles that United Materials will continue to assess.

**Project Results**

United Materials is now transferring the new technology to its first OEM customer. It is estimated it will take one to two years before the business will know the exact market impact and response in new system sales. To date, potential industrial clients are responding positively. The benefits of the new cutting system as compared to using garnet abrasives include: faster cut speeds, more accurate cuts, energy savings, less consumables – no landfill waste with recyclable abrasives, higher quality of cutting, and lower overall costs for end users.

Two jobs were created as a result of the project, with potential for more as the company grows.

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**Contractor:** United Materials, Inc.  
**County:** Erie County  
**ESD Region:** Western, NY  
**ESD Contact:** 518/292-5340

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**NYS EIP Investment:** \$ 198,774.43  
**Contractor Match:** \$ 828,085.23  
**Total:** \$1,026,859.66  
**Completion Date:** August, 2008