



iNANOCOMM

Integrated Nanotube Commercialization Award

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iNANOCOMM OVERVIEW

The Integrated Nanotube Commercialization Award, or iNanoComm, is a 1 metric ton (1,000 kg) matching award program for single wall carbon nanotubes (SWCNT) administered to research institutions.

iNanoComm is the principal method for researchers to co-finance their most interesting and innovative R&D projects dedicated to SWCNT applications.

As the largest materials award for SWCNT research, iNanoComm removes technical and economic barriers from working with carbon nanomaterials.

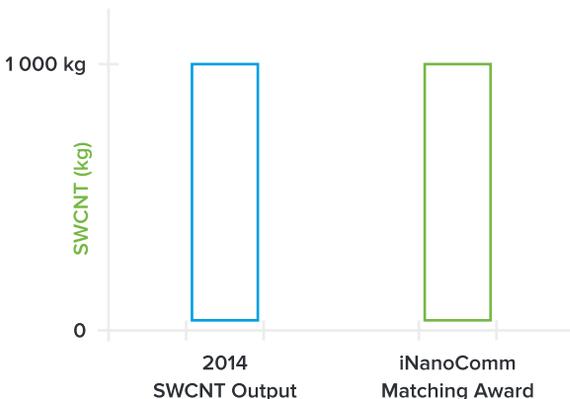
To demonstrate this commitment, free samples of 1 to 5 grams of high quality SWCNT material are available to researchers.

PROGRAM SIZE AND SCOPE

iNanoComm represents a challenge to both the research community and the industries they work with to think big. The program was started based on the belief that advanced materials lead to greater quality of life and global change for the better, and that carbon nanomaterials will be the next major source of materials improvement.

For perspective on the program scope, the Matching Award of 1 metric ton is equivalent to the total global SWCNT output in 2014. Acknowledging that single wall carbon nanotube capacity will increase to over 30 metric tons within the next 2 years, the program is also an investment in the future of materials technology.

HOW LARGE IS THE INANOCOMM MATCHING AWARD?

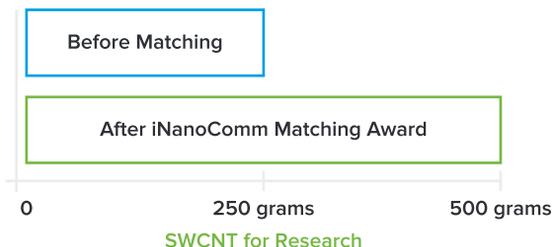


MATCHING AWARD WINNER BENEFITS

Matching grants provide a free amount of carbon nanotubes equivalent to the amount purchased, reducing costs by 50%.

For example, if a project requires 500 grams, the institution pays for 250 grams and iNanoComm matches this, providing an additional 250 grams at no cost.

MATCHING AWARD EXAMPLE – EQUIVALENT COST



Materials procured through an iNanoComm Matching Award amount to a cost reduction over 95% compared to similar quality carbon nanomaterials from other sources (given SWCNT from other sources range from \$250 to \$1,000 per gram).

Any follow-on commercial projects resulting from your research will also benefit from hands-on experience with TUBALL™, the highest volume single wall carbon nanotube product.

PRICING TO MATCHING AWARD WINNERS

TUBALL™ SWCNT is packaged in 50 and 100 gram containers, with prices starting at \$8.70 per gram before matching (net \$4.35/gram to award winners).

The minimum total SWCNT quantity is 100 grams after matching, and the maximum quantity available to each research institution is 50 kilograms.

PRICE PER GRAM TO MATCHING AWARD WINNERS

	Large research orders	Industrial research quantities	Basic research quantities
Volume	10–50 kg	1–10 kg	100–950 g
Price per gram after matching*	\$1.65	\$2.85	\$4.35

*Price per gram on Total Quantity after Matching Award
(e.g., a research project requires 500 grams, the price per gram is for 500 grams)

ELIGIBILITY FOR AWARD

All research institutions are eligible for the Award, including universities, colleges, national laboratories and other research-only organizations.

There are no restrictions on fields of application, and all researchers working with or looking to work with carbon nanotubes are encouraged to apply.

Research projects for commercialization applications, including fee for service and joint development work, are also highly supported.

Proposals are accepted starting February 3, 2015 and awards will be granted on a quarterly basis throughout 2015, with funding priority given to projects by application date.



**POWERED
BY TUBALL™**
rubberized latex of natural latex

- | | | |
|---|---|---|
| <p>✓ durability</p> <p>✓ flexibility</p> <p>✓ resistance to wear</p> | <p>improving properties:</p> <p>✓ strength</p> <p>✓ resistance to aging</p> <p>✓ resistance to cracking</p> | <p>✓ low rolling resistance</p> <p>✓ low hysteresis</p> <p>✓ low heat build-up</p> |
|---|---|---|

APPLICATION REQUIREMENTS

Applications will be evaluated based on advancement of the following key areas:

- Technical Merit;
- Commercial Merit;
- Potential for Breakthrough Global Impact in Commercializing and Advancing Nanotechnology.

Technical merit refers to the uniqueness, differentiation or approach of the application compared to current practices.

Commercial merit refers to how easily the project can be used in industry, such as scalability or ability to solve a common problem.

Potential for breakthrough impact refers to how likely the research will lead to an outsized impact – for example, a project that could improve airplane safety with sensing composites or research that could lead to more durable concrete, thereby reducing the number of repairs over its life cycle.



TUBALL™ 1 gram sample package



FREE SAMPLING OPPORTUNITIES

iNanoComm provides unprecedented access to single wall carbon nanotube sample materials, providing 1 to 5 grams of TUBALL™ SWCNT at no cost (free) to researchers.

- 1 gram of TUBALL™ SWCNT is available for all research projects;
- 5 grams of TUBALL™ SWCNT is available to researchers working on projects for commercialization applications (see below for details).

For comparison, at typical industry prices of similar materials between \$250 and \$1,000 per gram, this represents an effective materials benefit of up to \$3,125. In contrast, TUBALL™ SWCNT procured through iNanoComm Matching Awards have costs starting at \$4.35 per gram.

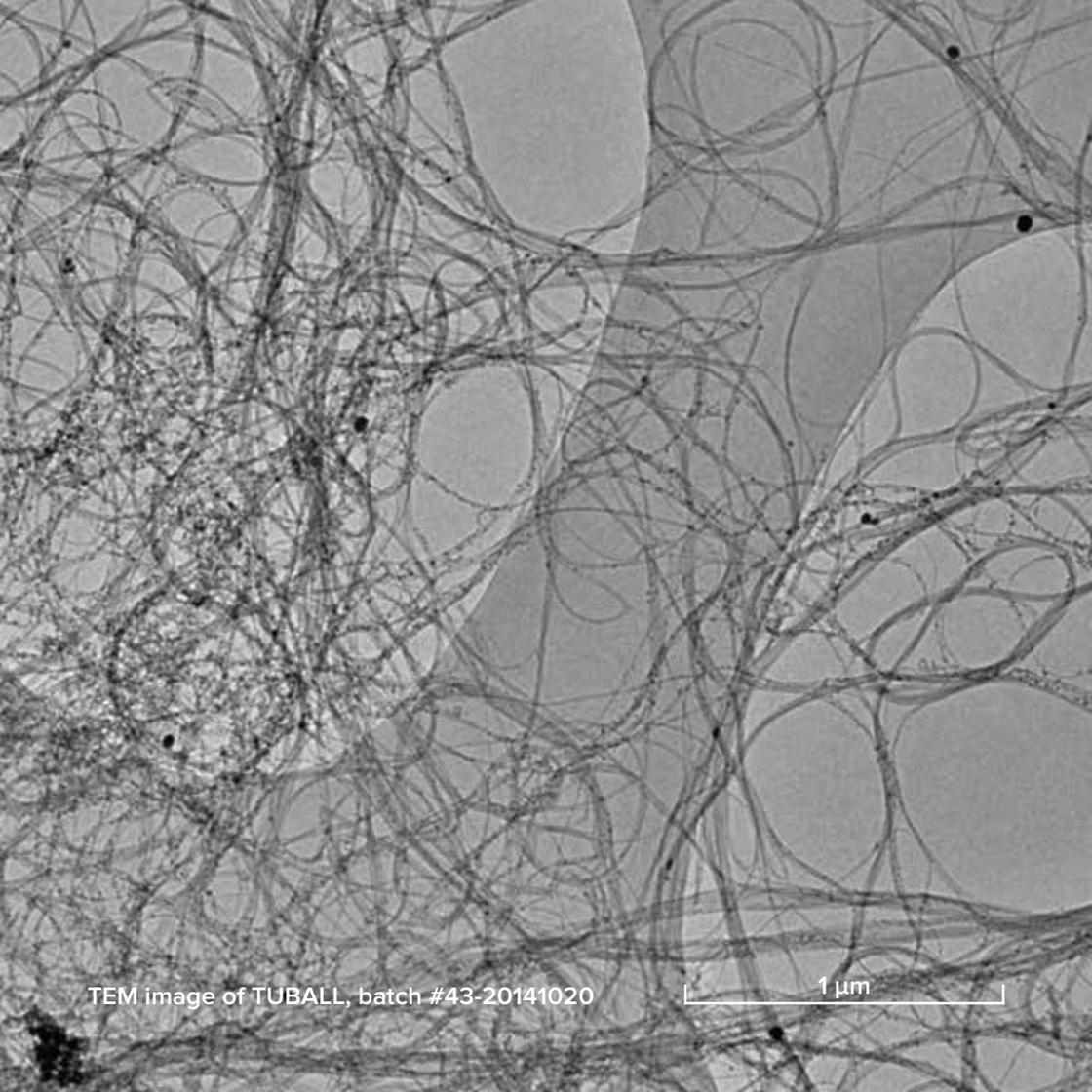
Commercialization applications include:

- Fee for service work, where the research institution is performing a service for a commercial entity;
- Joint development projects, where the research institution is working with a commercial entity, typically on new technologies, products, or applications;
- Any other commercialization project – contact us to discuss.

TUBALL™ SINGLE WALL CARBON NANOTUBES

TUBALL™ consists of single wall carbon nanotubes with an extremely low amount of impurities “as produced” (SWCNT content > 75%) and does not require further purification for a majority of applications.

- Proven effectiveness starting from 0.001% of filler content by weight;
- Simultaneously enhances material properties (mechanical strength, electrical conductivity, thermal conductivity);
- Wide range of possible applications: polymer composites, rubbers, metals, batteries and many others;
- High-quality of SWCNT content (amount of >75%, G/D higher than 50);
- Low amount of amorphous carbon (less than 1%);
- Majority of impurities are iron encapsulated;
- Minimal or no impact on production process;
- Market price 50 times lower than for any product with similar quality and properties.



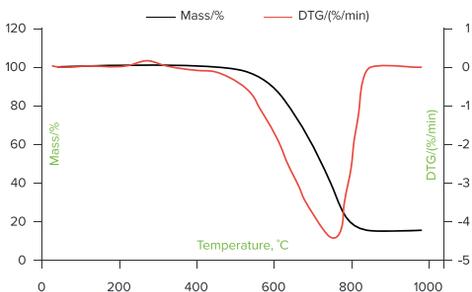
TEM image of TUBALL, batch #43-20141020

1 μ m

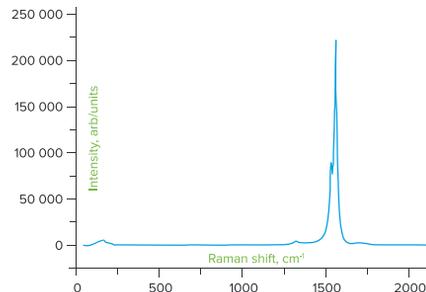
TUBALL™ TECHNICAL SPECIFICATIONS

Specification	Unit of measure	Value	Method of evaluation
Carbon content	wt.%	>85	TGA
CNT	wt.%	>75	TGA, TEM
Number of layers CNT	unit	1	TEM
Outer mean diameter	nm	1.8+/-0.4	Raman, TEM
Length of CNT	μm	>5	AFM
Metal impurities	wt.%	<15	TGA

TGA CURVES



RAMAN SPECTRUM



TUBALL™ PROPERTIES INDEPENDENT VERIFICATION

The Intertek logo consists of the word "Intertek" in white, bold, sans-serif font, centered within a dark blue rounded rectangular background.

CERTIFICATE OF ANALYSIS

Certificate Number: IWTN/COA/W663/001 (14 May 2014)

Specification	Value	Method of evaluation
Total Carbon	~85 w/w	Oxidative Combustion, TGA
Nanotube purity (T1%)	~74% +/- 1.5%	TGA
Raman G/D ratio	30.5 +/- 2.3	Raman, 633 nm
Raman G/D ratio (non-homogenized sample)	86.5 +/- 7.1	
Approximate average tube diameter	~1.5 nm	TEM

Download the certificate at www.inanocomm.org



INANOCOMM – EMPOWERING RESEARCH

With the potential to significantly alter the way institutions look at carbon nanomaterial research towards mass commercialization applications, iNanoComm is positioned to drive real change within the research community.

LAUNCH PARTNERS



The Smalley-Curl Center at Rice University is an inaugural iNanoComm award recipient for their work on creating a lightweight conductive thread of carbon nanotubes to replace copper wire and foster a new network of energy distribution in our nation's aging electrical infrastructure.



Concordia University is an award recipient for their work on conductive structural adhesives based on SWCNT and buckypapers. High strength conductive adhesives in the aerospace industry will ensure electrical continuity and improve charge dissipation, EMI shielding and lightning protection of bonded structures.



iNanoComm is sponsored by OCSiAI, an international nanotechnology company operating in the USA, Europe, South Korea and Russia. As the largest producer of single wall carbon nanotubes in the world, OCSiAI is a driving force in advancing nanomaterial applications. With over 50 million USD invested in carbon nanotube projects, OCSiAI partners with industry leaders across the globe to deliver the next level of materials technology and enable lighter, stronger and more conductive products.

OCSiAI at a Glance

- Invented a breakthrough new technology for the synthesis of carbon nanomaterials;
- Designed and built the largest industrial facility for the mass commercial production of single wall carbon nanotubes;
- Built a world-class management team capable of commercializing nanomaterials at global scale;
- Established partnerships in key application areas enabling broader adoption of SWCNT on a worldwide basis;
- Uniquely positioned to become the leader of the next materials revolution.

iNANO COMM
CONTACT INFORMATION



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To learn more visit the iNanoComm site at www.inanocomm.org





OCSiA R&D Center in Novosibirsk, Russia

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carbon
nanomaterials
for the global
industry

