

ChemNose

portable, low- power, autonomous gas- phase chemical sensor/ monitor for first responders

Low- power, electronic nose that stays young and accurate, suitable for a wide range of applications including chemicals processing/ transport, worker safety and homeland security.

Annual Sales Forecast for USA * 				Innovation Status		Idea
Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling	Development Status	Proprietary Protection Status	Concept Score
Ultra Low	\$0	\$1,400	\$16,000	1 of 5 In Development	2 of 5 Patent Pending	33 <small>29 is Average</small>
Low Support	\$19,000	\$68,000	\$180,000			
Medium Support	\$160,000	\$530,000	\$1.2 M			
High Support	\$460,000	\$1.5 M	\$3.2 M			
Ultra High	\$890,000	\$2.7 M	\$5.9 M	Remaining Time & Cost to First Sale		
				1-2 yrs	\$100k-\$1M	

ChemNose - portable, low- power, autonomous gas- phase chemical sensor/ monitor for first responders

Final Decision Maker: first responders, government safety officers, chemical processing/ transport plants, private citizens

Marrying a sensitive detector technology capable of distinguishing hundreds of different chemical compounds with a pattern- recognition module that mimics the way animals recognize odors, researchers at the National Institute of Standards and Technology (NIST) have created a new approach for "electronic noses." ChemNose is more adept than conventional methodologies at recognizing molecular features even for chemicals it has not been trained to detect and is robust enough to deal with changes in sensor response that come with wear and tear. The tunability of the new approach means that a variety of chemical warfare agents (CWAs) and toxic industrial chemicals (TICs) in air- based backgrounds can be detected with a variety of challenging interferences. New signal analysis schemes hold the potential for not only recognizing trained species, but also properly classifying "unknowns."

There are many attractive features inherent in ChemNose, including **small size** (individual device structures are ~100 microns square, and unpackaged arrays fit on a 1 mm x 1 mm chip), **low power consumption** (battery operation), and **tunability**. In addition, since our platforms are fabricated through CMOS- compatible silicon technology, **electronics can be added on- chip** to enhance operational signal handling architectures (and lower unit costs). Ease of integration and CMOS- compatibility would also aid coupling telemetry with the microsensors - thereby enabling network deployment. These aspects, as well as **batch manufacturable** fabrication, and the **robustness** against the effects of sensor drift or aging of the platforms and sensing films could facilitate commercialization in a broad range of applications.

ChemNose is based on interactions between chemical species and semiconducting sensor materials placed on top of MEMS microheater platforms developed at NIST. Eight types of sensors in the form of oxide films are deposited on the surface of 16 microheaters, with two copies of each material. Precise control of each of the individual heating elements allows each to be treated as a collection of virtual sensors at 350 temperature increments between 150 to 500 deg C, thus increasing the sensor number to ~ 5,600. The combination of sensing films and the ability to vary the temperature gives the device the analytical equivalent of a snout full of sensory neurons.

\$1,400 for top of the line state of the art combustible gases detector

Seeking: Purchase, Investment, Manufacturing/ R&D

-  **Email Inventor(s)**
-  **Link to Website With More Info**
-  **Link to YouTube Video**
-  **Inventor(s) Open to Consulting Requests**
-  **Agree to use Fair Contract**
-  **Invention can be exported**

* Consumption sales forecast. Does not include "Random" events or Inventory Fill . Forecast is for Year 1 for Large or Year 2 for Small Companies. Forecast should be read as ... With Low marketing support there is an 80% odds of achieving sales of at least...

Report Assumptions and Inventor(s) Commentary

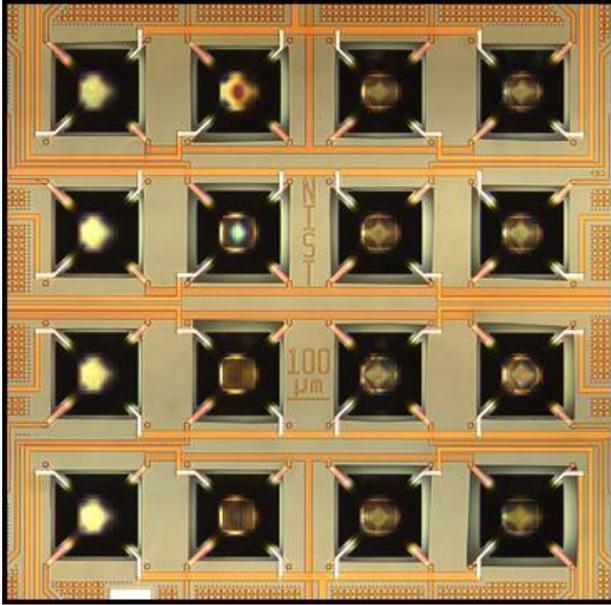
Inventor(s) Assumptions	"Most Likely" Estimate	Confidence	Inventor(s) Commentary Data Source or Basis for Assumptions
# of Possible Final Decision Makers	53,000	30%	3000 chemical products & prep firms 430 pipeline transport conservative # 1st responders: 1000/ state = 50,000 "first adoptors" to purchase personal sensor ~10% US households
Revenue per First Purchase	\$1,000.00	30%	Single- classification gas- phase detection on market for \$1,400 (eg combustibles). This technology is broad use, accurate, and refreshes itself to overcome aging of parts.
% that will Repeat	N/ A	N/ A	
Number of Annual Repeats	N/ A	N/ A	
Revenue per Repeat Purchase	N/ A	N/ A	
Reseller (Trade) Margin	50%	30%	The reseller margin estimates are based on industry averages
Producer Profit (EBITD)	17%	30%	the "most likely" margin estimate is based on industry averages. The high estimate is based on the drastic reduction in the cost for producing this technology as opposed others

Innovation Status			
Development Status	1 of 5 In Development		working prototype has been built and tested at NIST for a collection of target analytes; engineering of the product system(s) is required for different targets/ applications
Cost to First Sale (remaining)	\$100k-\$1M	30%	Cost to bring technology to market is 3 full- time employees to scale- up for production. Materials costs would be < \$200,000 if the company already has capital production equipment
Time to First Sale (remaining)	1-2 yrs	30%	the prototype has been built and tested - the MEMS- based manufacturing technique is well- established and the algorithm will be supported by NIST research
Confidence in Concept Claims made in description		50%	working prototype has been built and tested; results for certain demonstrations reported and/ or published
Proprietary Protection Status	2 of 5 Patent Pending		In addition to the three actively maintained patents, two new invention disclosures are currently being considered for patent filing

Concept Score & Diagnostics						
 Merwyn Concept Score With Confidence Bands			Concept Diagnostics	Red	Yellow	Green
			Percentile Group	Bottom 40%	Middle 40%	Top 20%
Pessimistic 80% odds of at Least	Most Likely 50% odds of at Least	Optimistic 20% odds of at Least	Overt Benefit			
			Reason to Believe			
24%	33%	41%	Dramatic Difference			

Inventor Commentary & Alternative Development Scenarios
Inventor(s) Sales Goals

Minimum Goal	\$50,000	Current GOAL	\$100,000
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16 element chemical microsensor array developed through CMOS with individually addressable microhotplates that are populated with robust nanomaterials for sensing target analytes

Inventor(s) Commentary:
CURRENT SALES FORECAST

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$0	\$1,400	\$16,000
Low Support	\$19,000	\$68,000	\$180,000
Medium Support	\$160,000	\$530,000	\$1.2 M
High Support	\$460,000	\$1.5 M	\$3.2 M
Ultra High	\$890,000	\$2.7 M	\$5.9 M

If MARKETING CONCEPT Improved

(Increase Concept Score by +20 Points)

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$0	\$2,300	\$27,000
Low Support	\$31,000	\$110,000	\$290,000
Medium Support	\$270,000	\$870,000	\$2.0 M
High Support	\$760,000	\$2.4 M	\$5.2 M
Ultra High	\$1.5 M	\$4.6 M	\$9.7 M

If MARKETING CONCEPT and PRODUCT/ SERVICE Improved

(Increase Concept +20 Points, Repeat Rate & Number of repeats by 30% and Revenue per purchase 20%)

Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$0	\$2,200	\$26,000
Low Support	\$31,000	\$110,000	\$300,000
Medium Support	\$270,000	\$870,000	\$1.9 M
High Support	\$760,000	\$2.4 M	\$5.2 M
Ultra High	\$1.5 M	\$4.5 M	\$9.6 M

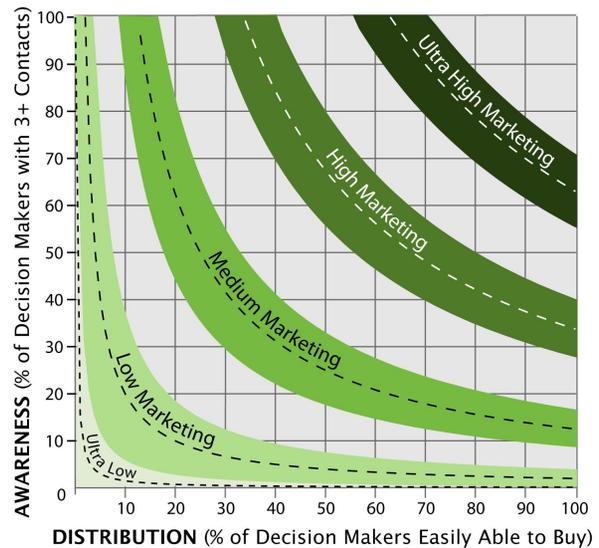


Additional Details

Fair Market Royalty (%)				
	Conservative - 80% Odds Royalty Percentage	Most Likely - 50% Odds Royalty Percentage	Aggressive - 20% Odds Royalty Percentage	
At CURRENT State & Status	1.2%	2%	2.9%	
Sales & Marketing Support Level	Annual Inventor Royalty Revenue			3 Year Value to Inventor If 50% Odds
	80% Odds	50% Odds	20% Odds	
Ultra Low Support	\$17	\$48	\$98	\$140
Low Support	\$290	\$740	\$1,400	\$2,200
Medium Support	\$2,100	\$5,300	\$10,000	\$16,000
High Support	\$5,800	\$14,000	\$27,000	\$43,000
Ultra High Support	\$11,000	\$27,000	\$50,000	\$81,000

Sales & Marketing Support Level Assumptions				
Sales & Marketing Support Level	Sample Numbers		% Aware x % Distribution (Aware & Able)	Inventor Estimate of Odds
	% Distribution	% Awareness		
Ultra Low Support (Word of Mouth)	5%	3%	0.2%	60%
Low Support (Small Company)	20%	10%	2%	50%
Medium Support (Medium Sized Company)	50%	25%	13%	40%
High Support (Large Company)	75%	45%	34%	20%
Ultra High Support (Mega or Niche)	90%	70%	63%	10%

Graph of EQUIVALENT (Awareness x Distribution) Combinations



NAICS Industry Codes For This Invention
32512 - Industrial Gas Manufacturing
32518 - Other Basic Inorganic Chemical Manufacturing
32519 - Other Basic Organic Chemical Manufacturing
54162 - Environmental Consulting Services
92811 - National Security

Patent Numbers that apply to this Product/ Service
5,345,213
5,464,966
6,095,681
5,356,756

Inventor(s) PEDIGREE	
Years EXPERIENCE in related industry	20
GRANTED Patents	5
Licensing Deals SIGNED	8
Innovations that have SHIPPED	0

For USA Patents: Utility Patent = 7 digit number, Design Patent starts with D, Planet Patent starts with PP. Provisional Application "61/ xxx,xxx", Non provisional application "12/ xxx,xxx", Design patent application "29/ xxx,xxx"

CAUTION: This Merwyn Business Simulation Research Report includes no warranty or guarantee. Results and opinions should be considered rough and directional in nature. This is because the report is based upon inventor-supplied data and simplified modeling methods. If you are looking to invest, distribute, purchase or become involved with this innovation, in any way, we strongly urge you to validate the inventor data and sales forecasts BEFORE committing yourself or your resources. Merwyn Research, Inc. shall not be responsible for any liability or damages arising out of the failure to perform such investigation and validation. Changes in the concept description, product, pricing, or input assumptions will almost certainly change results.



Additional Forecasts for Other Countries

Annual Sales - Probability Forecast - for Canada 			
Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	\$0	\$150	\$1,700
Low Support	\$2,100	\$7,500	\$20,000
Medium Support	\$18,000	\$58,000	\$130,000
High Support	\$51,000	\$160,000	\$360,000
Ultra High	\$98,000	\$300,000	\$660,000

Assumptions: exchange rate of \$1.00 US = \$1.01083 CAN; population of 33,390,141

Annual Sales - Probability Forecast - for United Kingdom 			
Sales & Marketing Support Level	Conservative 80% odds of selling	Most Likely 50% odds of selling	Aggressive 20% odds of selling
Ultra Low	£0	£140	£1,600
Low Support	£1,900	£6,800	£18,000
Medium Support	£16,000	£53,000	£120,000
High Support	£46,000	£150,000	£330,000
Ultra High	£89,000	£270,000	£600,000

Assumptions: exchange rate of \$1.00 US = £0.50458 UK; population of 60,776,238

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