

REQUEST # 65367

Seeking Designer for Modular Aquaculture Structures

RESPONSE DUE DATE: [\[3-4 weeks after launch\]](#)

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SOLUTION PROVIDER HELP DESK

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Opportunity

Contract research, joint development

Timeline

Phase 1 – Proof of Concept in 12 months

Phase 2 – Commercial Optimization in 12 months

Financials

Phase 1 – Proof of Concept funding up to **US\$ 100,000**

Phase 2 – Funding dependent upon adequate progress

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REQUEST FOR PROPOSAL DESCRIPTION

NineSigma, representing the **International Copper Association**, seeks **designers to create optimal modular constructions of copper-based aquaculture enclosures**. The aquaculture industry uses net pens for near-shore and offshore fish farming operations.

The successful **technology** will:

- Create modular elements to permit construction of aquaculture cages with:
 - Volumes from 100 to 50,000 m³
 - Volumes that minimize acute angles
 - Round or rectangular shape at surface, possibly with different shape at depth
 - Shapes that optimize fish health
- Standardize design and components
- Use copper alloy/s for panels and connectors
 - May use other materials in connectors if compatible (not promote corrosion) with copper alloy and marine environment
- Minimize surface area on which biofouling organisms can grow
- Be robust for marine applications in shallow and deep water

- Permit easy assembly and portability of components

The ideal **designer** will have:

- Demonstrated experience developing large-scale modular structures with easy onsite assembly and unit portability
- A broad understanding of engineering materials including polymers, textiles, metals, and composites
- A desire to think creatively about how to apply various materials and processes to achieve minimum cost designs
- The ability to prepare concept sketches, computer models, and physical prototypes
- Preferably, an understanding of properties of copper alloys
- Preferably, experience with marine structures

BACKGROUND

Expansion of aquaculture into the offshore environment through use of submerged cages is a growing concept in fish farming. The copper industry has demonstrated the value of using copper alloys for these structures^{1,2} to solve problems of biofouling, protection from predator

attack and fish escape, and decrease of pathogen and parasite infection.

One issue that remains is the physical design of panels and connection methods to permit scalable structures that are easy to transport, assemble, install, and use.

The International Copper Association (ICA),³ a trade association representing copper producers, fabricators, and processors, seeks to develop technologies that permit wide scale use of copper structures for marine aquaculture.

ANTICIPATED PROJECT PHASES OR PROJECT PLAN

Phase 1 – Proof of concept

Demonstration of design concepts and prototyping to demonstrate manufacturing processes, design functionality, and costs

Phase 2 – Commercial optimization

Technology refinement for commercial deployment in cooperation with aquaculture system suppliers

CRITERIA FOR MOVING FROM PHASE 1 TO PHASE 2

Client will consider for advancement research programs that make adequate progress toward commercialization.

APPROPRIATE RESPONSES TO THIS REQUEST

Responses from **companies** (small to large), **industrial designers**, **academic researchers**, other **research institutes**, **consultants**, **venture capitalists**, **entrepreneurs**, or **inventors** are welcome. For example:

I am a **company or academic person** with demonstrated experience in designing underwater structures.

I am a **company or academic person** with demonstrated experience designing and implementing modular, scalable and flexible structures.

RESPONDING TO THIS REQUEST

Appropriate responses will use the [proposal template](#) and address the following:

- Description of relevant experience with related projects

- Explain why your experience fits with request project
- Team description including relevant assets and capabilities
- Intellectual property position
 - List of relevant patents, if available
 - Desired relationship with sponsor
- Description of project engagement, including
 - Willingness to work with third parties (e.g. development synergy, co-funding)
 - Timeline and budget

NON-CONFIDENTIAL DISCLOSURE

By submitting a Response you represent that the Response does not and will not be deemed to contain any confidential information of any kind whatsoever.

Your Response should be an executive summary (about 3 pages). The Response should briefly describe the technical approach and provide information on technology performance, background, and description of the responding team and their related experience.

By submitting a Response, you acknowledge that NineSigma's client reserves the sole and absolute right and discretion to select for award all, some, or none of the Responses received for this announcement. NineSigma's client also may choose to select only specific tasks within a proposal for award. NineSigma's client has the sole and absolute discretion to determine all award amounts.

RESPONSE EVALUATION

NineSigma's client will evaluate the **Response** using the following criteria:

- Overall scientific and technical merit of the proposed approach
- Approach to proof of concept or performance
- Potential for proprietary position (i.e., is the technology novel or protectable)
- Economic potential of concept
- Respondent's capabilities and related experience
- Realism of the proposed plan and cost estimates

The client will contact respondents with highly responsive proposals for next steps.

ENDNOTE

¹[Design Guide](#)—Copper Alloy Mesh in Marine Aquaculture, International Copper Research Association, July 1984. See pp. 10, 14, 16, and 20 for examples of small-scale structures.

²[Copper Alloys for Marine Aquaculture](#), International Copper Association brief.

³International Copper Association (<http://www.copperinfo.com/>)