

Vibrating Ice Scraper

### Rescue Launcher



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Sketch Model Review



## **40,000** Coast Guard search and rescue cases per year





1800 coast guard boats 280 navy ships 500 cruise ships

6200 beaches

10000 rescue teams

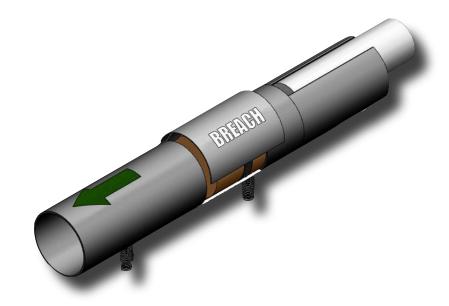


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customer needs and market research

#### features:

line retrieval system variable range projectile versatility quick-change CO<sub>2</sub> canisters 700 m range



4.5' long cannon4" diameter projectile15 lbs

#### Launching Systems:

#### **Mechanical (spring or elastic)**

power reload consistency



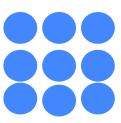
#### **Combustion**

power reload consistency



#### **Compressed gas**

power reload consistency









design alternatives











range	122 m	30 m	700 m
size and weight	2.5' long, mid-weight	1.5' diameter disk, 3 lbs	4.5' long, 15 lbs
launch mechanism	compressed air need scuba tank or air compressor	human-powered	compressed CO <sub>2</sub> 5 lb canister at 1800 psi
projectile options	inflatable sling floatable line phosphorescent grappling hook	floatable disk line	inflatable sling floatable line marker buoy search light
shots per reload	multiple	I	2
features	folding stock shoulder-mounted launching safety	very portable quick to deploy	line retrieval projectile versatility shoulder mounted variable shot length
cost	\$2330	\$35	\$1000

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benchmarking

#### **Results**

80ft@80psi Coiled rope in barrel best Valve leakage a concern Projectile seal accuracy important

# Future Quick-change CO2 Pressure regulator Inclinometer





Vibrating Ice Scraper



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Questions