

Description: Automatic Ice Scraper

SILVER

Intended Customer: Car owners in colder regions of the US

Market: Automotive Accessories

Customer Need	Design Attribute	Engineering Specification
Minimal effort required to scrape ice	Applied force at hand grips is less than the maximum required for competitor ice scrapers	< 70 N (user testing)
Quick clearing time	Clearing time for a 58" x 34" windshield	< 5 min
Lightweight	Weight	< 3 lbs
Able to reach middle of windshield	Length from handhold to blade	≥ 18 in
Compact storage in car	Size	≤ 4" x 4" x 32"
Comfortable to hold	Handle diameter	1" ≤ diameter ≤ 1.5" (to accommodate 5 th percentile woman's hand)
	Handhold length	3.2" < length < 3.8" (to accommodate 95 th percentile man's hand)
Affordable	Consumer price	< \$100
Works in freezing conditions	Electronics operating temperature range	> -40° F
Not contaminated by water or grime	Meets appropriate Ingress Protection Rating	IP56
Operates effectively over range of ice thickness	Range of ice thickness clearable	0 < thickness < 0.15" ice
Long running time	High duty cycle	> 20 min on, < 1 hr off