Sugure

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Spring 2014

Vacuum Suction Roof Rack

The heart of Sugure's design is an aluminum extrusion that facilitates mounting. A vacuum chamber within the extrusion allows for universal mounting. This means Sugure is simple to manufacture and does not require vehicle-specific hardware for installation.

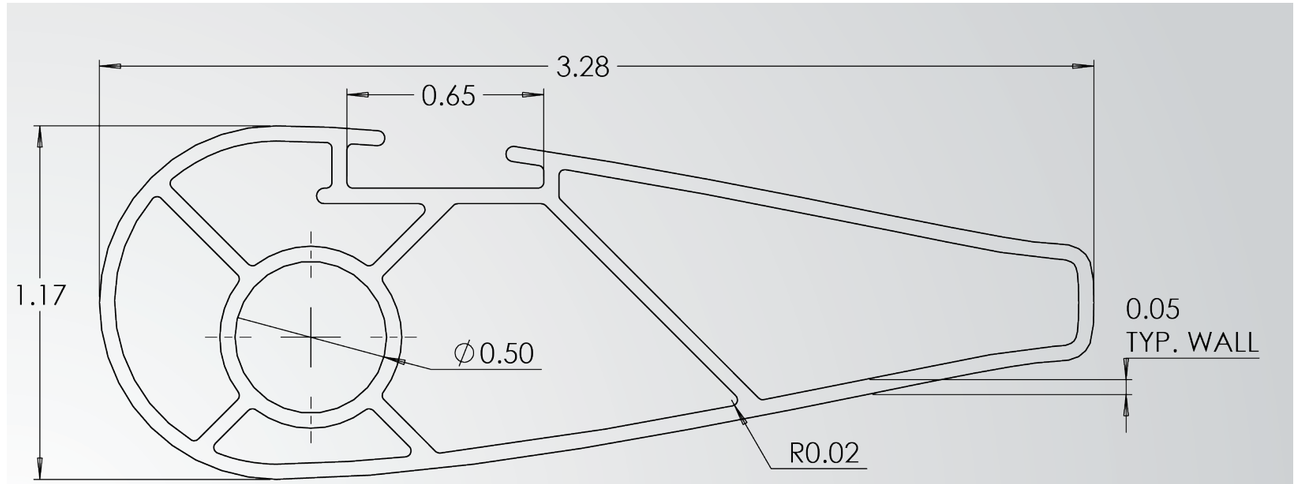
The design incorporates aluminum, rubber and glass-filled co-polyester plastic to create an attractive roof rack that is also rugged.

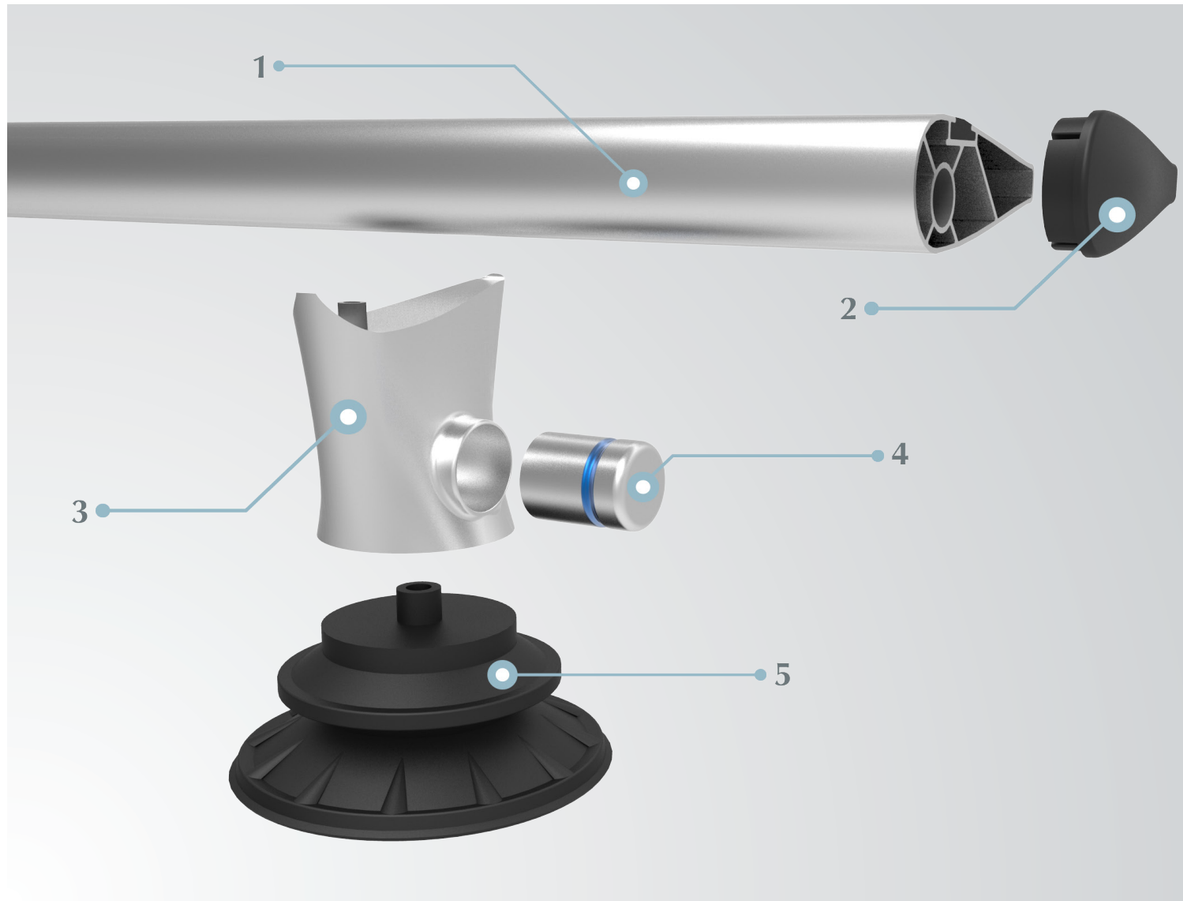
Design

Material

Alloy 6063-T6 is used for the extrusion because of its strength-to-weight ratio, corrosion resistance and machinability. This alloy and temper are well suited for use in an outdoor environment.

A **nominal wall of .05 inches** provides optimal strength while reducing weight.





1. Crossbar

Clear hard coat anodized aluminum extrusion is milled to fit the Supports.

2. End Cap

Injection molded glass-filled polycarbonate plastic caps seal each end of the Crossbar.

3. Support

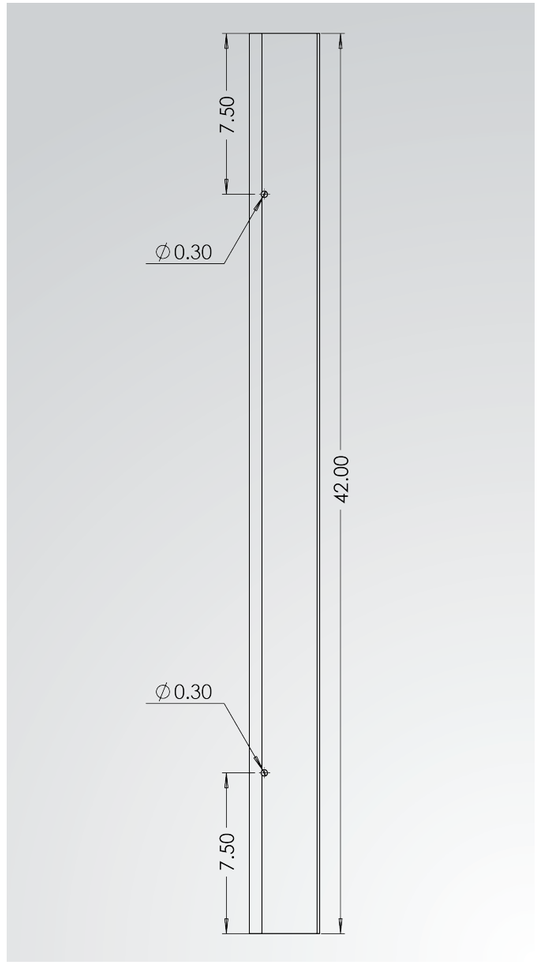
Each die-cast aluminum Support is milled and houses a rubber gasket. When each gasket is aligned and inserted to the Crossbar, the Supports are TIG welded to the Crossbar.

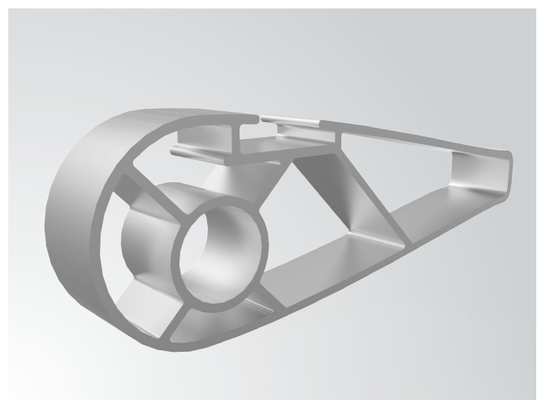
4. Plunger

The milled aluminum plunger works by forcing air through a one-way valve on the driver-side Support.

5. Vacuum Cup

Weather-resistant rubber Vacuum Cups are aligned and bonded to the Support.





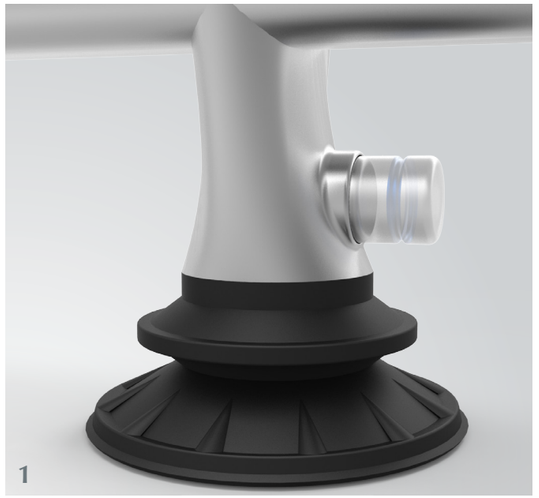
Aerodynamic Form

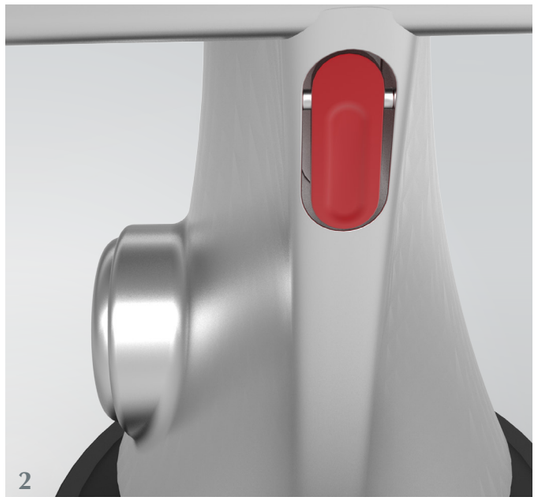
Helps **increase fuel economy** and **reduces noise.**

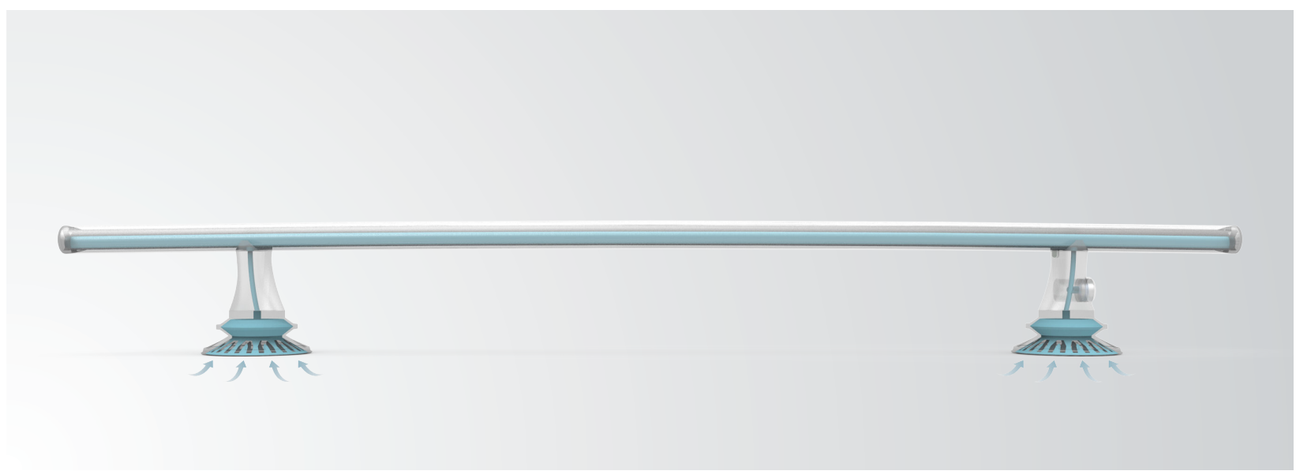
Function

Vacuum Chamber

A hollow shape within the aluminum extrusion acts as a vacuum chamber; this is used to mount the rack to the vehicle. Rubber cups must be positioned on a smooth area of the roof to hold the rack in place. The air is then pumped out and an area of low pressure is created within the rack. This area of low pressure creates strong suction capable of **holding up to 120 lbs** of gear. The flexible bellow in each vacuum cup allows the rack to naturally adapt to the curvature of the roof. Using vacuum cups for mounting reduces the risk of damaging or permanently marking the vehicle's paint.







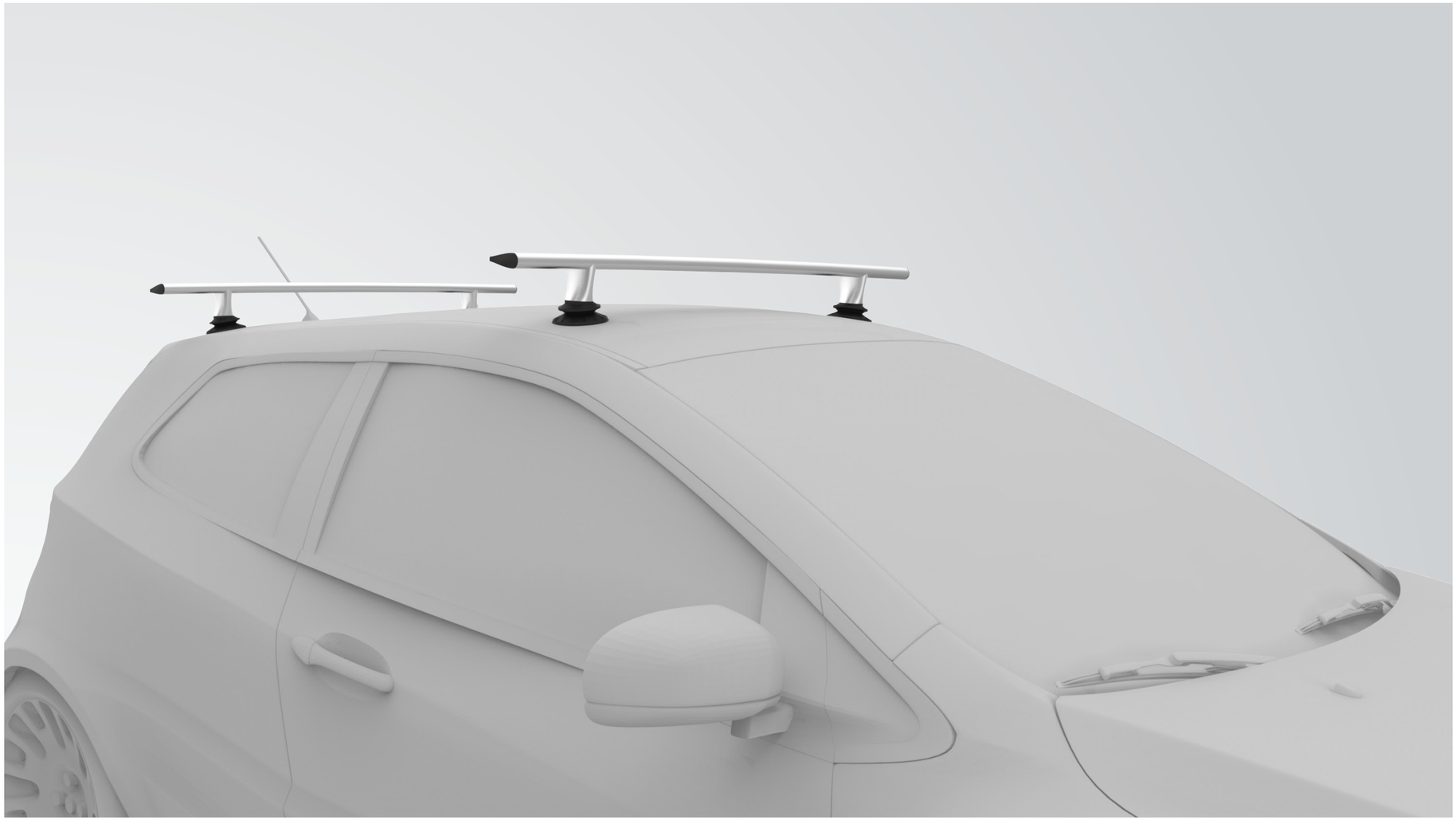
1. Vacuum Pump

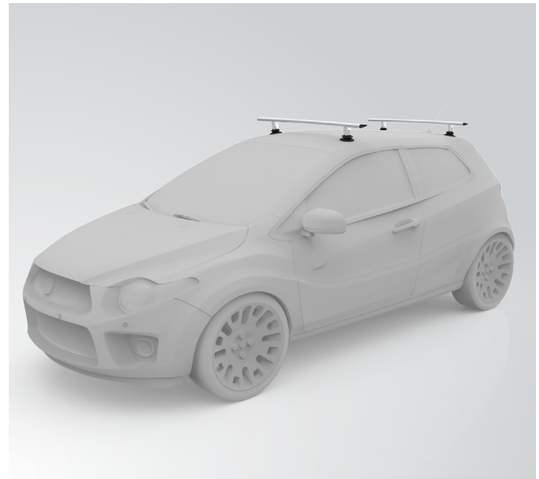
Located on the driver-side support, the pump engages by repeatedly depressing the plunger until it no longer protrudes from the support. A **low pressure indicator** line on the plunger provides the user with visual feedback when pressure is low or lost.

The pump design was inspired by the current tools used to move and place large sheets of glass in the construction industry.

2. Pressure Release

The pressure release valve is tucked away on the backside of the support to **protect against accidental release** of pressure. When pressed, the one-way valve releases the seal, which then allows for quick removal of the rack.





CONTEXT