

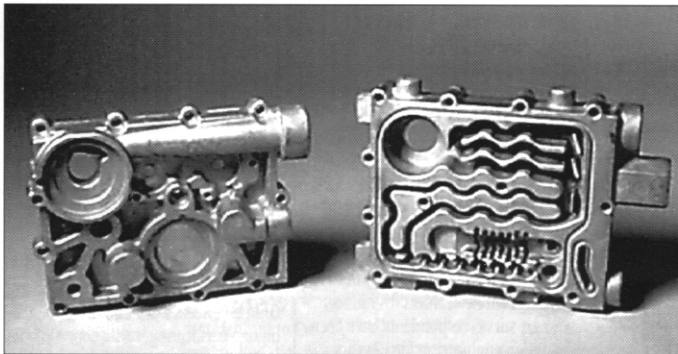


## Chicago White Metal Casting

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**GFI's advanced vaporizer/regulator for alternate fuel systems, die cast by CWM, won the NADCA Die Casting Competition Al Grand Award**

## Al Die Casting Optimum Choice for Complex Propane Vaporizer Unit



**Two intricate aluminum die castings are the heart of the new propane vaporizer/regulator, die cast by CWM with channel walls, and the spaces between them, 0.040 in. (1.016 mm) thick.**

Faced with ever more demanding environmental questions and concerns with gasoline availability, the transportation industry has been pursuing an alternative fuel technology to reduce and eventually replace gasoline consumption.

GFI has emerged as a world leader in alternative fuel research and technology. It has developed a unique reputation for technologically advanced, trouble-free and universally adaptable fuel systems for propane and natural gas vehicles.

One of the latest advances in alternative fuel system components is the patented GFI liquid propane vaporizer/regulator. Originally produced as a foundry casting with extensive machining, volume projections called for more efficient manufacturing.

### **Award-Winning Al Die Castings**

The new-generation vaporizer/regulator, termed a breakthrough in design and execution by GFI, is a two-part aluminum die cast

assembly produced by CWM.

The castings won the North American Die Casting Association's International Die Casting Competition Grand Award category for "Aluminum, 1-10 lbs."

### **A Complex Heat Exchanger**

Aluminum 380 was the obvious alloy choice for this component, to provide optimum heat dissipation and light weight.

Measuring approximately 4 5/8 in. (117.5mm) x 6 3/4 in. (171.5mm) x 2 1/2 in. (63.5mm), the compact vaporizer/regulator provides two-stage pressure regulation for steady, consistent pressure delivery. Designed to meet original equipment manufacturer specifications, the unit can be used with either naturally aspirated or turbocharged engines.

The die cast assembly is a complex 1.23-lb. (0.558 kg) heat exchanger and 0.97-lb. (0.44 kg) cover. Channel walls, and the spaces between them, are 0.040 in. (1.016 mm) thick

and required very special attention in gating and die construction, according to John Stocker, CWM's Vice President of Engineering.

### **Computer Die Design Simulation**

Computer die design modeling was used to simulate cast metal flow and thermal performance in the die to predict and control critical temperature gradients. A vacuum system was applied during production to control porosity.

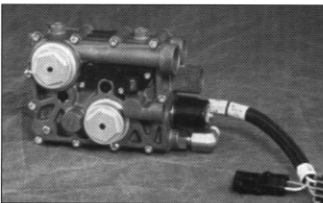
After trimming, machining and deburring, the parts are given a sulfuric-acid anodize coating with a dichromate seal per MIL spec A-8625F Type II Class 1. The parts also receive 100% impregnation.

Twenty-three of the holes specified in the parts are cast in place to size, in addition to many special features. The stringent requirements for the vaporizer's sealing surfaces, of course, call for machined surface finishes beyond the as-cast capability of the die casting process.

### **Special Secondary Machining Specs**

CNC machining is performed in-house by CWM, using specially designed tools that produce the precise surface finishes required for the sealing surfaces for O ring grooves and the formed fittings that mate with the castings. CNC work centers are also used for required milling, thread milling, drilling and tapping.

For further information on Chicago White Metal production capabilities in all of the most widely used die casting alloys, contact your CWM Sales-Engineering Representative or the CWM Sales Dept. ■



**This new compact 2-stage vaporizer/regulator, a breakthrough in propane technology, is small enough to accommodate packaging in virtually all under-the-hood environments.**