Welcomel

It is with pleasure and pride that we welcome you to the Chevrolet-Saginaw Nodular Iron Metel-Casting Plant.

This booklet is presented to you who are interested in a brief word and picture description of our plant in operation.

Our plant has been called a "Monument to Modern Technology." It contains the latest electronically controlled material handling and process equipment, as well as the latest in emission control and ventilation facilities.

The Nodular Iron Metal Casting Plant is relatively new. Our first production operations were started in the fall of 1967.

We are proud of the part we play in the Chevrolet Motor Division and of our contribution to making our community a better place in which to live and work.

B. N. Ecklhorn
Plant Manager

HISTORY

General Motors has a long and illustrious history as an industrial citizen of Saginaw. From a modest beginning in 1919, with five employees and a capacity of 250 tons per day, our Chevrolet-Saginaw Metal Casting Plants have now grown to include four modern, modern capacity with a capacity of 650 tons per hour. The complex consists of the Grey Iron Casting Plant, the Nodular Iron Casting Plant, and an Administration Building.

The Nodular Iron Casting Plant is the newest member of the family, but its history can be traced back through developments at the Grey Iron Plant.

In the early 1960s, Gray Iron embarked on a new pilot plant, the construction of which is an experimental foundry to be used to study the possible development of a new product called "Nodular Iron.

Completed in 1962, the experiment was so successful that the ground was broken for the Nodular Iron Casting Plant in October of 1964. With more than 200,000 square feet of floor space, the plant began production in the fall of 1967.

The history of the Nodular Iron Casting Plant has been a history of growth. Originally designed as the most modern casting plant of its type, the plant has not only grown in physical size, but also in innovative techniques, processes and controls.

The original land area of 78 acres has been expanded to 256 acres. The plant area now covers 1,252,815 square feet of available floor area, including modern heat treat facilities. One additional modern molding and melting facility now provides us with five automated molding lines and related facilities.

Quality has always been a prime goal for Chevrolet - Nodular Iron is proud of its contribution. The latest in ultra-sonic and other testing equipment is utilized to assure the quality of our Nodular Castings.

Emphasis has continuously been placed on working conditions for employees and on the ecology of our environment.

The plant was pre-engineered for safety and the safety of all employees is a never ending goal - both on and off the job.

Included in the Nodular Iron complex is a complete medical facility and our own fire brigade. Training of plant personnel in the above areas is a continuous process.

Nodular Iron was designed to have 52 air changes per hour with 250,000 tons of cleaned air supplied daily. Plant projects, completed and in progress, will further improve the on-site environment.

Our capsulas are equipped with sophisticated emission control systems to assure proper environmental conditions outside the plant.

An indication of the importance of the Nodular Iron Casting Plant, not only to Saginaw, but to the Nation, is included in these statistics. (Source: Foundry Magazine)

In 1970, the Nodular Iron Casting Plant shipped 10% of the Nodular Iron Castings in the U.S.; in 1975 this was increased to approximately 14.4%.

Methods, equipment and materials employed at Nodular Iron are constantly being improved, thus contributing to the Chevrolet reputation for safety, quality, reliability, efficiency and performance.

The brief description of operations which follows is intended to give you a better understanding of the work carried on by the employees of the Nodular Iron Casting Plant...
What is Nodular Iron?

Nodular iron is iron that results from a process that changes the shape of one of the main chemical elements (carbon) in the iron from flake shape to ball shape. The ball, or sphere shape of the carbon is called a “nodule” hence the name Nodular Iron. The ball shape of the carbon results from a magnesium treasching process.

Nodular iron is actually a graphite steel which combines the processing advantages of grey cast iron, low melting point, good fluidity, castability and excellent machinability; with the added advantages of high strength, toughness, ductility, high workability, corrosion resistance and hardendability.

Nodular iron is a material which can be processed (including most of the heat treatments) equally as well as steel and at a somewhat lower material cost.

A ferro-silicon-magnesium alloy is used to treat the basic iron and change the carbon from flake to spherical form. The alloy is placed in an empty ladle with a layer of ferro-silicon as a cover. This allows the magnesium to react throughout the full ladle of iron from bottom to top when the basic molten iron is added. (The ferro-silicon insulates the magnesium from the iron until the ladle is full.)

The chemical analysis, molten metal temperature, pouring rate and duration of cooling time are important factors in successfully controlling the quality of Nodular Iron in the “as cast” state.

The following illustrations show the graphite formation of Nodular Iron and Grey Iron magnified approximately 100 times.
The Nodular Iron Casting Plant Story

Shown on this, and the following pages, are some of the steps involved in producing quality Nodular Iron Castings.

The process involves many workers; many different processes are required to transform a variety of raw materials into quality automotive parts.

Much work has already been accomplished before the operations can even begin. Raw materials, including many tons of sand, have been inspected, unloaded, cleaned, mixed and conveyed throughout the plant.

Some of operations follow in the process flow, converting the raw materials into finished Nodular iron castings. And still the work is not done.

Inspection, ultrasonic testing, storage and shipping to other Chevrolet Manufacturing Plants are yet to follow.

Carriens of sand ready to be dumped, dried and stored in one of the twelve 1,000 ton storage bins.

A SPArmatic molding machine in operation. There are two machines on each of the five molding lines.

Blowing excess sand from the mold and setting cores on the Molding Line.

Pouring molten nodular iron into approximately 2500°F with the mold.

Shearout operation. Here the casting is separated from sand and excess metal, then loaded into the Power & Free Buckets for subsequent casting.

Removal of excess metal on Differential Carrier after the Shearout operation.
Nodularity of steering knuckles is being checked at the lathe operation. Other non-destructive testing operations also assure quality.

All for one end result - shipment of quality Nodular Iron Castings.

Nodular Iron Casting Plant
Did You Know That?...

- Chevrolet-Nuclor Iron conserves enough energy through its conservation program to supply electricity to approximately 5,400 homes per month.
- Our program saves enough natural gas to heat an additional 1,000 homes per month with natural gas.
- We also conserve enough water for another 85 homes per month.
- Over 8.8 miles of power conveyor carry over 3,000 tons of material a day.

MAJOR PRODUCTS:

- Steering Knuckles
- Disc Brake Caliper Housings
- Differential Carriers, Caps, Cases
- Crankshafts
- Prop Shaft Yokes
- Clutch Pressure Plates
- Flywheels

- Approximately 10 car-loads & 40 semi-trailer loads of finished Castings are shipped daily from Nuclor Iron.
- Chevrolet-Nuclor Iron Casting Plant employs over 2,900 people.
- Chevrolet-Nuclor Iron Casting Plant consists of 298 acres; floor space total over 1,323,815 square feet.
- Chevrolet Nuclor Division is the largest manufacturer of automobile parts in the world.

This emblem has become our mark of quality. Through it we dedicate ourselves to pride of workmanship so that we may attain GM’s Mark of Excellence.

“The Mark of Excellence is the customer’s assurance that in a GM product or service he buys the best.”

Let’s keep it that way!

EQUAL OPPORTUNITY EMPLOYMENT POLICY

Opening on a three-year nationwide basis, General Motors Corporation offers employment opportunities to people in many different locations throughout the United States.

The policy of the Corporation is to extend these opportunities to qualified applicants, without regard to sex, race, creed, color, national origin, age or handicap.

“Hiring and employment practices and procedures implementing this policy are the responsibility of the employing unit. However, these practices, procedures and decisions are to be at all times, in conformity with the Corporation’s Equal Opportunity Employment Policy.”