

# CAPABILITIES

**Sivyer Steel Castings LLC is a vertically integrated steel foundry offering our customers a wide range of capabilities that can be tailored to meet their specific casting needs and specifications.** Whether it be a simple shaped, low alloy, level 3, normalize only casting, to a complex design, high strength alloy requiring austenitize, water quench and tempering, Sivyer has the capacity to deliver. We offer design for manufacturability advice, utilize proven foundry engineering principles along with solidification modeling software to develop pattern equipment with robust gating and risering for producing high integrity steel castings. Along with all of the typical core making, molding, melting and finishing capabilities, we also provide extensive in house heat treat facilities, in house non-destructive testing including x-ray, machining and pattern repair services.





## ENGINEERING

Starting with the customer's design or 3-D model, Sivyer engineers can provide foundry specific suggestions for improving the manufacturability of the part. We then develop the cores and pattern equipment needed to produce a quality casting. The pouring and solidification of each casting is simulated using MAGMASoft software prior to the first casting being poured. This insures all potential casting and solidification defects can be identified and engineered out before proceeding to actually pour molten metal into the mold.

## CORE MAKING

The core is the first element of any complex casting. It must be strong enough to support itself during the pouring process and yet it must break down at the proper time to prevent unwanted casting cracks from forming. We utilize both Pep Set and Alpha Set binder systems depending on the application. Additionally, a variety of core washes are also incorporated into the process pending upon the metal grade that will be used.

## MOLDING

Sivyer utilizes 100% Alpha Set binder systems in our air set molding process. We have 3 molding lines. Two molding lines utilize steel flasks ranging up to 140" x 140" and one molding line that produces flaskless molds up to 48" x 60". Our molding lines utilize state of the art, programmable sand mixers capable of up delivering up to 2000 pounds per minute while selecting from 4 different sand options. Our equipment can produce molds capable of consuming up to 24,000 net tons of steel per year.

## MELTING

Our facility utilizes three electric arc melting furnaces rated at 10 tons each. The furnaces are basic lined and have the theoretical capability of melting up to 40,000 gross tons per year. We certify each heat of metal with our two spectrometers which measure 22 different elements as well as our gas analyzer for determining levels of nitrogen and hydrogen. Our metals lab can perform tensile, charpy, metallography and brinell tests and has the capability of preparing EDM samples from casting sections.

## FINISHING

All steel castings require a certain number of standard finishing operations such as burning, arc air washing, normalizing, welding, grinding, pressing and shot blasting. Sivyer offers all of these traditional services and our welders are certified to American Society of Engineers (ASME) section 9.

## HEAT TREAT

The Sivyer Steel heat treat department consists of 13 heat treat ovens and one large water quench tank. We have the ability to process castings requiring normalize operations only, or high temp austenitize, quench and temper. Our high velocity, variable intensity water quench is capable of delivering castings with very stringent mechanical properties.

## NON-DESTRUCTIVE EVALUATION

In order to deliver the highest quality castings with the highest level of internal and external soundness Sivyer utilizes a variety of non-destructive testing techniques. We have an in-house 4MEV electron beam accelerator capable of x-raying up to 13 inches of steel very quickly. We also have available 4 Magnaflux wet mag particle machines. The largest is a 20,000 amp unit for very large castings. We also employ ultrasonic evaluation for internal soundness. Our NDE department is managed by our own Level III certified technician and we also have on staff several additional Level II technicians.

## MACHINING

Machining is an integral part of what we do at Sivyer Steel. Our in-house machine shop is capable of supporting our finishing department by providing rough turning, milling and boring of our steel castings. Additionally, we can offer our customers certain fully machined castings completed either internally at our machine shop or sourced externally at one of our machining partners.

## VALUE ADD

A major strength of our organization is the use of our Odyssey ERP system. We develop a detailed process control plan for each of our customer's castings and that information is available to our employees at their workstations via over 30 remote terminals located throughout the plant. Every element of the casting process is captured by our data collection system and each casting has a unique serial number cast on to it and is traceable through the entire process. Also we offer our customers on-site pattern repair and maintenance as well as secure, protected pattern storage off site.

