



What SILICON RAW C&S Inc. does:

SILICON was started in 1982 with the goal to service the REFRACTORY industry with special refractory anchoring* systems (please see the attached annexure on its explanation), which holds in place a special insulation to contain the heat energy that the process needs to accomplish a certain (chemical) reaction or effectuate certain properties in materials. This heat energy can manifest itself from temperatures ranging as low as 200 deg C to 1800 deg C .

These refractory anchors are welded to the steel casing. This steel casing forms the outside shell of the furnace.

Because of the high temperatures encountered in this industry, wear and tear, corrosion and metal fatigue determine the life time of the metal alloy. It is never an infinite life time.

There are many kinds of furnaces and these can be relatively small, 4-5 M3 to possibly 10000 M3 in shapes that can be anything from a block model to a high tower.

The furnaces that we concentrate on are typically furnaces for the Refining of crude oil, its sub products and furnaces in the cement and steel industry.

Wikipedia explains these applications very clearly and there you can get the full concept of how the process works.

When such furnaces need to be repaired, the refractory materials are demolished using jack hammers and the anchors are removed by grinding or gauging. This is a fairly dangerous process as big blocks of concrete can fall down unexpectedly especially when the anchors have corroded or broken off the steel casing. This is not something we get involved in. The spaces are known as confined spaces and are sometimes very claustrophobic.

Once this demolition is done and the surfaces of the furnace are free from refractory concrete, the surface is marked out to indicate the locations where the anchors need to be placed. This information is usually obtained from specifications and drawings supplied by the customer. This is work that we sometimes do as well. Subsequently these positions need to be ground to a clean metallic surface using a grinder. The size that needs to be ground is about 1" in diameter. The numbers of refractory anchors that can be used in any such furnace are anything between 1000 – 100000 pieces.

Normally a welder using an electrode will weld these anchors and it takes him about 10-25 anchors that he can weld per hour. This means many man hours are used to make sure these anchors get welded properly. This is also a very dangerous process because the fumes that come off are very toxic and the welder will need special protective breathing masks to ensure he does not suffocate.

Silicon, using our Rapid Arc Welding technology can offer to weld these anchors at a rate of 120-250 per hour which is about 10x as fast. This means you need fewer persons in the confined space to be

able to carry out the same work. Additionally the welding process does not emit any toxic fumes so special breathing gear is not required unless other gases or dust particles are present that may cause a hazard for the operator.

When the furnace is repaired they stop production and they call these repairs 'TURNAROUNDS or shutdowns'. These can cost the customer as much as \$ 0,5M to \$ 4,0M per day depending on the type of installation or factory they need to fix.

Our services reduce the time that they need to be out of production. This reduction in 'downtime' is what attracts the customer to our services. There are similar systems on the market called stud welding but they are not as good as Rapid Arc Welding (RAW) and many of the anchors tend to fall off due to the fact that the technologies they use are very old. Common rejection rates with stud welding are 15%-50% and RAW is almost ZERO%. This is where we make the difference. We can reduce the down times and save them a lot of money in a very safe manner.

This is what Silicon offers and this is what we do best and are unique in the whole world for what we do.

So SILICON is a one stop shop for:

1. Anchor design for better life time
2. High quality Anchor production and associated products
3. The proper and correct Installation of the anchors on location.

We do not demolish the old refractory but we can mark and grind as well as the welding of the anchors.

This formula should trigger a strong interest with persons who are familiar in repairing furnaces.

The communication lines Silicon seeks are the persons that are responsible for the maintenance, inspection and installation of refractory materials at the refinery or cement plants.

Contact us at your convenience for a free presentation or demonstration.

Wouter Garot B.Sc.

CEO and Founder

SILICON RAW C&S Inc.