VETRITE – WATERJET CUT

Waterjet cut plays a fundamental role in the treatment of Vetrite. Cutting Vetrite using the Waterjet machine allows not only to realize slabs of a smaller size than those that are available in stock, but also to provide the customer with slabs having dimensions and shape perfectly matching their wishes in a timely manner. Furthermore, Waterjet cut makes sophisticated solutions such as the combinations of Vetrite parts and mosaic inserts possible, allowing the full exploitation of Vetrite's decorative potential.

Waterjet machines are commonly used to treat materials, such as marble and metal, that are substantially different from Vetrite. Whoever is used to using the Waterjet machine for working such materials and intends to use it in order to work Vetrite is required to respect given parameters when setting the machine and to comply with specific guidelines that have the goal of granting that the integrity and the beauty of the Vetrite slabs subject to the Waterjet cut are preserved.

This document specifies the parameters to adopt when setting the Waterjet machine in order to cut Vetrite and provides the guidelines to follow in order for the Waterjet cut to be performed in a proper way. This document must be necessarily read alongside the installation manual for Vetrite (available on the website: https://www.sicisvetrite.com/), the mandatory tool to refer to for whomever aims to work, stock or lay Vetrite.

WATERJET – PARAMETERS

The following chart features the parameters to comply with when setting the Waterjet machine prior to the cut of Vetrite. Make sure that dimensions and characteristics of the physical parts of the machine (orifice for the water, focusing tube) and of the abrasive employed adhere with what specified by this chart.

waterjet settings	
abrasive	sand 80 mesh (or thinner)
rate of abrasive in the jet	250g/min
cut speed (6 mm slab)	950mm/min
cut speed (10 mm slab)	500mm/min
orifice	0,254mm
waterjet ray/compensation	0,5 mm
high pressure	1500psi
low pressure	500psi
entering water pressure	6 bar
focusing tube	7.14x1.02x76.2mm

nesting settings	
software used	Lantek
distance between torches	4mm
lead-in value (distance)	7mm
lead-out (distance)	5mm
width of the bridge	0,1mm
static piercing time (low pressure)	2 sec
static piercing time (high pressure)	2 sec
head distance of the jet from the slab	2mm

PREPARATION OF THE SLAB ON THE WORK SURFACE

Before launching the machine, it is essential to lay the Vetrite slab onto a flat work surface. The slab must be laid onto a flat but non-continuous surface (such as a grid). If the slab was laid onto a continuous surface (such as a marble slab), the jet of water proceeding at normal cut speed that pierces the slab and hits the underlying surface would cause the so called “bounce effect”, which would damage the Vetrite slab. Likewise, the Vetrite slab would be damaged by the movement of the jet of water proceeding at cut speed if it was not completely flat. It is thus extremely important to make sure that these requisites are fulfilled before performing the Waterjet cut.

BREAKTHRUOGH

Experience shows that the most critical phase of the Waterjet cut is the breakthrough. Breakthrough is the moment when the machine opens the jet and the jet pierces the slab for the first time. A point above the work surface in which the machine opens the jet is designated. The jet starts at low pressure and, after a static piercing time that we suggest to set at 2 seconds, switches to high pressure. After 2 more seconds of static piercing at high pressure, the jet, already at high pressure, starts to move and goes on performing the cut by moving along the cut trajectory that the operator had previously set using the machine’s software.

Breakthrough performed in an improper way may cause the slab to crack and break. However, performing the breakthrough in the proper way allows to preserve the integrity of the slab. To this end, we now provide the guidelines to follow when cutting Vetrite using the Waterjet machine.

Perform the breakthrough not directly onto the perimeter to be cut, but at least 7 mm away from it. In case you are not experienced in the field of Waterjet cutting and want to be particularly cautious, start this pre-cut phase at a greater distance from the cut trajectory. It is always preferable, when possible, to perform the breakthrough outside of the slab’s surface. In case it is not possible (for instance, when performing the cut in order to make a slot onto the slab’s surface), do the breakthrough onto a part of the slab’s surface that will be then removed. This way, the breakthrough and the switch from low pressure to high pressure will happen outside of the cut trajectory and the jet of water will reach the cut trajectory after that the breakthrough has already taken place and already at high pressure.

The “lead-in” phase described above gives the operator the time necessary to check that the jet of water properly works before that it reaches the cut trajectory. During this time, in case the jet of water does not work as planned, the operator can stop the machine and change its settings. During the lead-in phase the jet of water, already at high pressure, moves slower than its normal cut speed (we

suggest to set the machine in order for the lead-in speed to be around 2/3 of the cut speed), giving the operator enough time to make sure that the machine and the jet of water work properly.

The parameters featured in the chart above are those that SICIS's experience has revealed to be optimal for cutting Vetrite using the Waterjet machine, whichever the machine used to perform the cut is. Vetrite is a complex of different technologies and different materials having different characteristics and physical and mechanical resistances, mixed in order to develop a wide range of esthetic effects. Furthermore, the Waterjet cut is a process influenced by a multitude of factors: the condition of the machines used, the degree of erosion of their physical components (such as the orifices and the focusing tube), the conditions of the work surface. For these reasons it is important not only that the Waterjet operators perform the Waterjet cut complying with the parameters specified above, but also that the operators apply to the cut what they have learnt in their personal experience of using the machines at their disposal. Therefore, the development of a file that foresees the machine to autonomously perform the breakthrough in the proper way may turn relatively time-consuming. In case the operator intends to cut a high number of Vetrite slabs all having the same size, this approach is obviously convenient since it makes it possible to develop just one file and use it for cutting several pieces, resulting in a significant optimization of work time. Otherwise, in case the operator intends to cut just one slab of Vetrite or a limited amount of them, experience shows that it is practically more convenient to manually drill a hole (using an electric screwdriver and a 10-12 mm wide diamond bit) in the point where the breakthrough is foreseen to take place and to only later launch the machine. This way, the jet will do the breakthrough and will switch from low to high pressure without physically hitting the Vetrite's surface and will only then, after that the breakthrough has already happened and the jet is already at high pressure, start to move along the cut trajectory.

REMOVING THE SLAB FROM THE WORK SURFACE

Once the Waterjet cut has been performed, it is necessary to lift the slab up and remove it from the work surface. In order for the slab not to crack and break during this operation, use appropriate tools and make sure that the slab never bends when being lifted up. Make sure that the slab remains in a straight position during the whole operation. Chose and put into practice the most appropriate way to lift the slab up depending on its size, the presence of drills, slots or notches onto the slab's surface, their number and their size.