A step up in stainless steel laser cutting

Those damned protection films?!

Your laser cutting machine is really quite an astonishing piece of technology. It lets you process work at rates you once thought were impossible. But just when everything is moving into high gear and you are starting to break all of your previous production records, the protection film on your sheet starts bubbling and you have to hit the brakes and reset everything. What a waste! If it weren’t for those damned protection films, you could work twice as fast, and the quality of the end result would be twice as good. Well, what if there was a protection film that would make this problem go away? Impossible you say? Well, we may have just the solution you need; Laserguard, a new protection film for stainless steel laser cutting.

A film that sticks tight

Laserguard, by Nitto Europe, is actually a three layer film. There is the adhesive, a carrier, and finally a release coating. The biggest challenge was in balancing the strength of the adhesive. Nitto Europe engineers have developed a formula with the necessary adhesion strength — one that avoids bubble-forming even when cutting thick sheets at high speed. But on the other hand, if you want to remove the film at the end of the production cycle, it shouldn’t stick too hard either. Nitto calculated the associated maximum adhesion strength and balanced Laserguard between this maximum and minimum. In practice, this maximum is higher for thick sheets than for thin ones. This is why Nitto Europe developed two types of film: a standard version for sheets up to 5mm and a light version for sheets up to 2mm.

Let’s take a closer look at the technical performance of this film. Is it really so much better than the standard protection films you normally have to work with?

No bubbles?

To cut through thick metal sheets in one run, the laser beam has to move slowly — well, slower than for thin sheets anyway. Since the laser beam has to spend more time on one spot than for thin sheets, there is considerably more heat transfer. Obviously, both the metal sheet and the protection film warm up. If the heat resistance of the film is insufficient, it will distort. What’s more, since the laser head remains in one position quite some time, there is also gas pressure on the film for a relatively long period. This is the real culprit; you experience troubles with bubble-forming because the heat loosens the adhesive and the gas blows the film up. Most films cannot withstand both the heat and the gas pressure sufficiently. This forces you to do two runs: one to pre-cut the film and one to actually cut through the metal.

Nitto committed a lot of research into understanding this phenomenon while it was developing Laserguard. The film is designed with a better heat resistance and has a stronger adhesion level. This makes it possible to laser cut stainless steel sheets of up to 5mm in thickness with just one run. There is no need for pre-cutting.

Lab tests and actual day-to-day shop floor results
have proven that there is no bubble-forming whatsoever. Now you can finally use your LC machine in top gear to maximize speed and profits.

**What about carbon smudges?**

Another common problem with most UV resistant protection films is that the bottom layer is black. This leaves carbon residues during laser cutting which can discolor the surface of the metal or clog-up the laser head. Laserguard films are all white and carbon free. As the Laserguard films are all white and carbon free, you do not lose precious time cleaning up after the laser cutting process.

![Laserguard has a blue printing. Laserguard Light can be recognized thanks to the silver printing.](image)

The composition of the material is such that there is absolutely no interference with the laser beam either. This eliminates the risk of rough cutting edges, a problem you have surely encountered with standard protection films.

**At the end user’s work shop**

Another trend you are sure to recognize is that the quality control demands of the end user are getting much more stringent. Their products are becoming more expensive because of higher steel prices. So they invariably insist on top quality for their raw materials. They can no longer afford the luxury of loosing pieces during bending or welding. Once again, the adhesive quality of the film has to prove itself. Even when the film is perforated throughout, or when the piece is bent in all sorts of directions, the film must not loosen, not even in the tiniest corner. Also, a clean cut is absolutely essential. And good elongation properties are a must to avoid breaking the film during the bending process. Laserguard scores well on every one of these points.

**Lamination and removal of the film**

When a metal sheet arrives in your job shop, the protection film is usually already applied. This is done by the steel producers or the steel service centres. Since lamination processes are fully automatic, it is important that the huge rolls of film unwind easily so that the process never gets stuck. Laserguard is given an extra layer of wax on the top surface so that even with a strong adhesive, the rolls of film unwind smoothly, without using too much force that will stretch or distort the film.

And of course, when the final product is delivered, the film should be easy to remove - even though the film stuck tight throughout all of the previous operations. Here again, the balanced adhesion level of Laserguard optimizes the procedure. No wonder Nitto Europe put so much effort into finding the perfect adhesive formula.

This all sounds great, but as they say, “the proof of the pudding is in the eating.” All major manufacturers of laser cutting machines have tested the Laserguard film on their newest machines. They agree unanimously; Laserguard is the best film on the market. It is easy to make these claims but a better idea is for you to prove it for yourself. Contact Nitto Europe for some samples and perform test runs of your own. Then you’ll know for sure.

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