



## BPS 729

David Rennie

*Welcome to another podcast from Air Products. I'm Ed McKendry, and today I'm speaking with David Rennie, US Applications Manager for the Air Products BPS Product line. David, thank you for being with us today.*

Thank you, Ed.

*To get started, our very first question - talk a little bit about the Air Products BPS product line and its applications.*

The BPS product line is a new family of products that Air Products is currently rolling out. These products are targeted for the test, assembly and packaging areas. This is a new market in which Air Products is participating in and this is our line of products that is being targeted. The products typically fall into one of two areas – we are going after the test and probe area in which we're using our products to clean aluminum bond pads, things of that nature, we're using them for removing metal oxides, whether it be copper oxide or aluminum oxide, and the second main area is in the saw and dicing applications – this is using some of our products during the saw and dicing process in order to prevent particle deposition on the wafers and also to remove metal oxide films, as well.

*I see there is a product called BPS 729 – can you describe that for us - what is that?*

Sure, that is the product that we're pitching for the saw and dicing application. This product is used during the saw process and what happens is that this product is injected into the DI water during the saw process. BPS 729 is a multi-component surfactant-containing product. wafers.

It's used, as I mentioned, in the saw and dicing applications and it has two main functions, one main function is to remove particles from the surface of the wafer during the saw and dicing operation – these are silicon particles that accumulate on the wafer surface from the cutting of the silicon wafer. The second application is for removing metal oxide films, for example, aluminum oxide or copper oxide.

*So BPS 729 is not a surfactant?*

It's not a surfactant itself; it's a multi-component product, so it's a formulated product, one of the components of which is a surfactant. The product has the surfactant in it for several reasons - it's useful for better wetting of the surface of the wafer which then can enhance particle removal – that's one of the mechanisms through which this product will help to remove particles. It also, for instance, in the case of a copper surface, it has a slight undercutting mechanism in order to help remove particles, as well.

*Can you talk about the technologies/processes/substrates that BPS 729 can it be used on?*

The main process this product is targeted for is the saw process. This is where the silicon wafer is cut into the individual die. During that process silicon particles are generated – these particles can adhere to aluminum bond pad surfaces, copper surfaces and so forth. The product is used to minimize the particle deposition on the wafer so when the wafers are done with the saw and dicing process they come out with very few particles on them. It's also used for metal oxide removal so on the aluminum bond pads, we're trying to prevent corrosion, and we're trying to prevent oxidation of those bond pads during the saw process. This product will help minimize oxidation or even remove some of the metal oxides such as aluminum oxide and copper oxide. So the substrates that these are really targeted for are aluminum bond pad type wafers and copper wafers that are going through the saw process.

*It sounded like you were going to begin talking about some of the benefits, enhance on that, if you would. Talk about some of the benefits of this product over current techniques and chemistries.*

We already mentioned the ability of the product to remove particles from the wafer surface. We mentioned the ability of the product to remove metal oxide films such as aluminum oxide and copper oxide. One of the other nice features of this product is that it can replace CO<sub>2</sub> sparging which is a technology that customers currently use and they sparge CO<sub>2</sub> into the water during the saw process for two reasons: One of which is to lower the pH level of the water in order to minimize the amount of aluminum corrosion that takes place during the saw process. BPS 729 has that same effect. The second reason people CO<sub>2</sub> sparge is that it reduces the resistivity of the DI water, which thereby reduces the electrostatic charge buildup which can attract particles. BPS 729 has the same effect; in fact, it reduces the resistivity of the DI water even further than CO<sub>2</sub> sparging.

*With all these benefits, how does BPS 729 reduce costs for a customer?*

One of the ways is gaining a higher wafer throughput. What happens currently is that if the customer is using DI water to do the saw process, the wafers come out of the process with particles on them, so there is a need for an extra step in the process. You need to do a post-scrub in order to remove those particles. By using BPS 729 during the saw process, you can effectively eliminate that post-saw scrub process, thereby eliminating a step in the process. This allows you to move wafers through your line at a quicker pace. Also, further downstream, you get to a step called wirebonding, where you're actually trying to bond wires onto the bond pads. If there is a metal oxide film on those bond pads you need to remove that metal oxide film, so some customers use a downstream argon cleaning process in order to try to remove that oxide and clean that film. If you remove the oxide film by using BPS 729 during the saw process, you can then eliminate that downstream process clean. Another way is higher yield – if we have more effective removal of particles from the wafer surface you'll gain more good die so that you can enhance your yield, as well, with this process.

*Can BPS 729 be used with other BPS products for maybe even additional benefits?*

Yes it can. For example, you can use BPS 729 in conjunction with one of our other BPS products, BPS 100. BPS 100 is very good for removing aluminum oxide. As we talked about earlier, you want to minimize or remove aluminum oxide during the saw process. By using a dual process of BPS 100 first to remove that aluminum oxide, followed by BPS 729 during the saw process, you'll first remove the aluminum oxide with the BPS 100, then you will minimize the re-growth of the aluminum oxide during the saw process by using the BPS 729, thereby, as mentioned before, eliminating the need for any downstream clean processes to remove the metal oxide.

*This BPS 729, is it compatible with typical tools and materials of construction?*

Yes it is. We have run compatibility tests between the BPS 729 and standard materials of construction that are used in tools, materials such as 316L electropolished stainless steel, Teflon, PFA – all the materials that are typically used with saw tools and equipment. BPS 729 is compatible with most of the common materials you will see in equipment.

*Are there any EH&S benefits to using BPS 729?*

Yes there are. BPS 729 does not contain PFOS, it also does not contain any silicones. There is no bacteria formation that will occur in the product over the course of time, so it has a long shelf-life of 2 years. There also will be no separation of the components of the product over the course of time and in terms of disposal, the recommended method of disposal is down an acid drain.

*So the things you talked about – if you could clarify for the listeners – what really are the key messages of your talk here?*

The key messages around the BPS 729 is that it is a new product that Air Products is rolling out, it's used in the saw and dicing application, and it does have benefits over the currently used processes that customers are using. It can reduce the customers' costs, it can give them a higher wafer throughput, it can also increase yield.

*Sounds like a good story. Where would our listeners go for more information on this BPS 729, the whole product line, really?*

Customers can go to our website at [www.airproducts.com/bps](http://www.airproducts.com/bps) - we have an overview of the product line there, we also have some narrated presentations on specific BPS products, we have additional podcasts on specific BPS products, and listeners can certainly feel free to email me – my email address is [RENNIEDB@airproducts.com](mailto:RENNIEDB@airproducts.com) .

Once again for the listeners, so that you get that information, the website is [www.airproducts.com/BPS](http://www.airproducts.com/BPS) and David's email is [RENNIEDB@airproducts.com](mailto:RENNIEDB@airproducts.com). David, thank you again for your time, we do appreciate it.

Thank you, Ed.

And for our listeners, once again I'd like to continue to encourage you to visit the Air Products eLearning Center at [www.airproducts.com/electronics](http://www.airproducts.com/electronics) where we have series of podcasts like the one you're listening to today. Thank you very much for listening to this Air Products podcast.