Akasel Fact Sheet

DiaUltra 2-in-1 Diamond Suspension

January 2021





DiaUltra

With inspiration from our best performing and most successful diamond suspension to date, DiaMaxx, we have developed a tremendously improved 2-in-1 suspension called ***DiaUltra***.
High-quality synthetic diamonds, a unique lubrication system, carefully selected suspending agents and numerous tests have resulted in the best diamond suspension ever!

- ***More than 25% higher removal rates than the best competing diamond suspension.***
- ***Fastest preparation times and substantial consumable savings.***
- ***Best quality surface finish for shorter following preparation steps.***

Who should use DiaUltra?

If you already are working with 2-in-1 diamond suspensions, either surface specific suspensions that are recommended for a certain fine-grinding disc or polishing cloth or other more generic suspensions, then you can use ***DiaUltra*** to reduce your preparation time.
With ***DiaUltra*** you do not need a specific suspension for every fine-grinding disc or polishing cloth. Our unique formulation allows us to only have one suspension per grain size. ***DiaUltra*** can be used for all materials - both soft and hard - where other suspensions need two different versions, one for soft and one for hard materials.

If you are using diamond suspension and lubricant separately you should also consider to work with our new ***DiaUltra*** 2-in-1 diamond suspension. You only have to apply one liquid which is pre-mixed in the correct suspension/lubricant ratio. This is much more user-friendly and reproducible and, due to the ingredients used in ***DiaUltra*** you will also achieve higher removal rates and thus shorter preparation times.

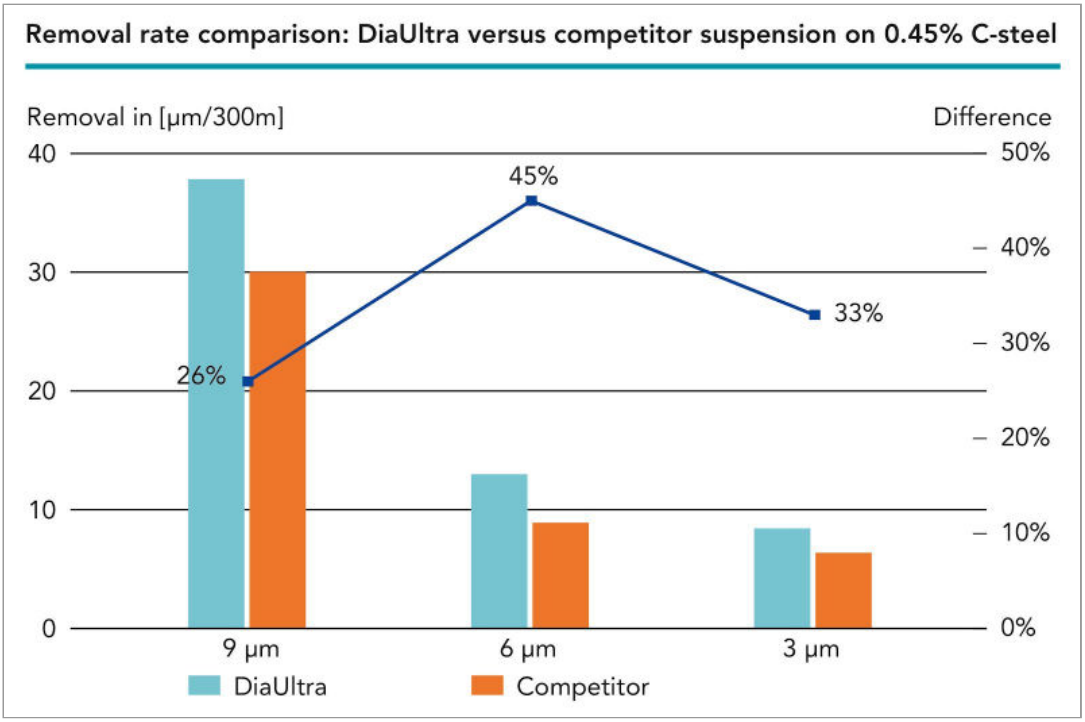
With **higher removal**, **faster preparation**, **better surface quality** and probably also **lower prices** you should not only trust us - you should test us.

Detailed Technical Information

Highest Removal Rates

We have succeeded in developing a new formulation with a very high removal rate by modifying and exchanging some of the key ingredients from our best performing 2-in-1 suspension DiaMaxx. At the same time we have managed to keep the same high quality surface finish that we are used to from DiaMaxx. The combination of an extremely high removal rate and perfect surface finish allows us to reduce the preparation time remarkably.

To make absolutely sure that we have the best suspension ever, we have not only compared ***DiaUltra*** with our own products, but we have also made measurements against the best performing competitive suspension. The results are outstanding:



As you can see from this graph, the removal rate of ***DiaUltra*** is, for all the measured grain sizes, at least 25% higher than the removal of the competitive suspension.

Fastest Preparation Times

The removal rate measurements show that ***DiaUltra*** outperforms competing suspensions by far. However, we also wanted to document that these figures actually will result in a measurable advantage for our customers. Therefore, we have used ***DiaUltra*** to re-run some of our Aka-Brief preparation methods. This was done to compare the preparation times both against our own methods, but also against the equivalent methods from our competitors.

The conclusion is that the preparation times are clearly reduced when using ***DiaUltra***. Both the fine grinding step and the diamond polishing steps are up to 40% shorter.

Current Aka-Brief preparation method with DiaMaxx Poly:

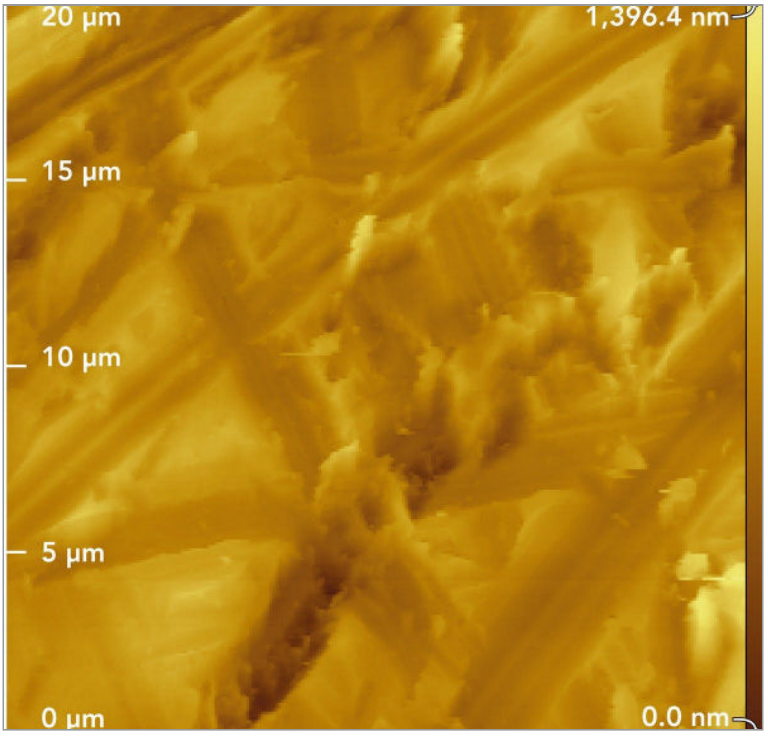
*New Aka-Brief preparation method with **DiaUltra**.*
Steps 2, 3 and 4 have been reduced with almost 40%:

Click on the Aka-Brief method for details and the Final Result

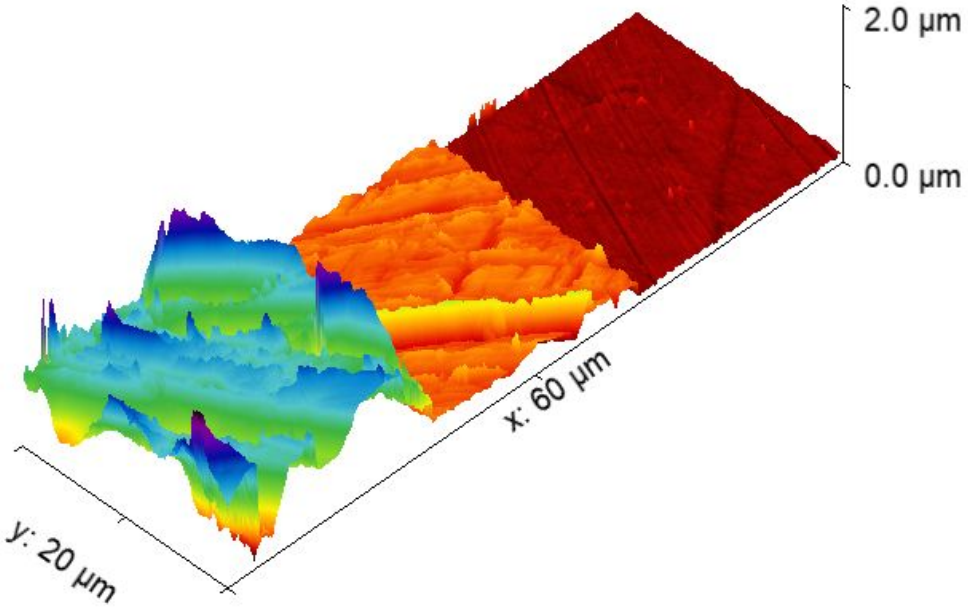
As you can see from the comparison above, our new Aka-Brief preparation method with ***DiaUltra*** is already much faster than the current Aka-Brief method. When comparing the new method with ***DiaUltra*** to competitive methods our preparation time is less than half. This reduction not only saves important time, it will also provide a tremendous saving in consumables.
With half the preparation time, you only use half the amount of diamond suspension. Your polishing cloth will probably last for the same length of time (in minutes), thus allowing for many more samples to be prepared on the same cloth - again reducing the actual cost per prepared sample.
In production/quality control, time is usually an important factor. The faster the result is ready, the sooner the production can either continue or be corrected if necessary. As production cost can be very high, time savings are often much more important than savings in consumables. With ***DiaUltra*** you will reduce both preparation time and consumable cost.

Best Surface Finish / Quality

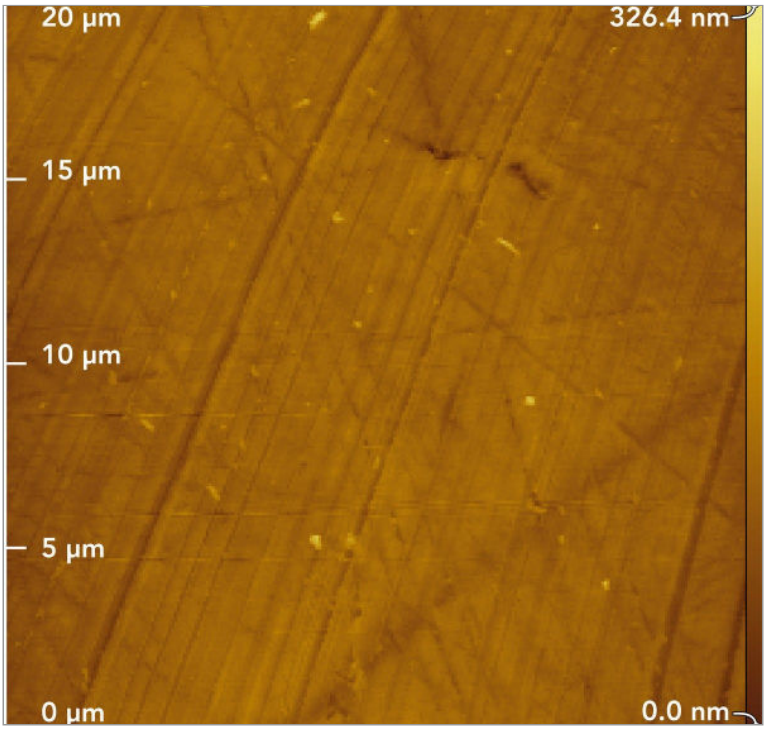
It is difficult, if not impossible to examine and characterise scratches after a preparation step under an optical microscope. To be able to quantify the scratches and compare different preparation steps and suspensions we are using our AFM (Atomic Force Microscope). As you can see from the image below, you do not only get a very clear image at a high magnification, you also get a measurement of the scratch depth. This makes it possible to compare different suspension formulations and in combination with the removal rate measurements find the formulation that produces the fastest and best result.



The image to the left shows the surface of a steel sample after fine grinding on an Aka-Allegran 9 with DiaUltra 9 µm. The scratches show a "real" grinding action, where chips are removed in a clean cutting action, with only a very limited amount of deformation. The remaining scratch depth is approximately 1,000 nm/1 µm (see colour scale on right side of image), making it possible to remove the remnant scratches in a short time during the following step.



This image combines three different scans after 9, 6 and 3 µm preparation steps with ***DiaUltra*** respectively. It clearly shows how the surface gets finer and finer with shallower scratches after each step.



After a 3 µm ***DiaUltra*** step on a Daran cloth the remaining scratches are below 300nm/0.3 µm. As the resolution of an optical microscope is about 1 µm, these scratches are almost invisible and might only show up in darkfield.

These images illustrate how good a surface finish we can achieve with our new ***DiaUltra*** suspensions.

DiaUltra will improve your sample preparation with:
Higher Removal Rates - Faster Preparation Times - Better Surface Finish