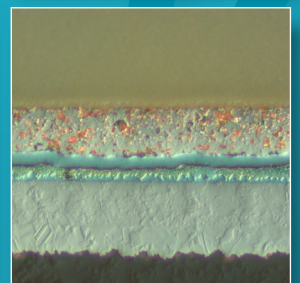
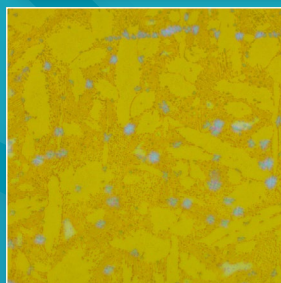
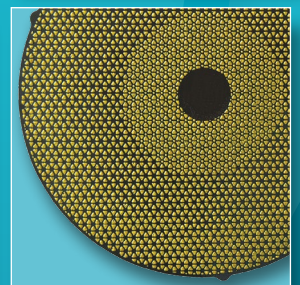
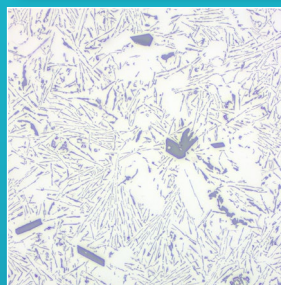
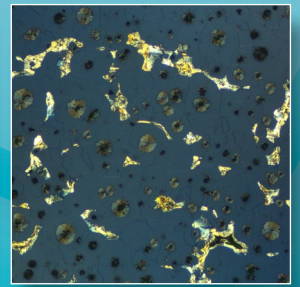
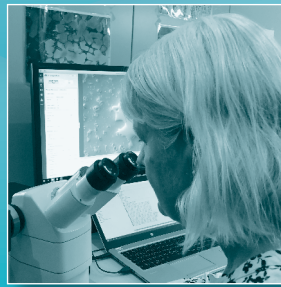
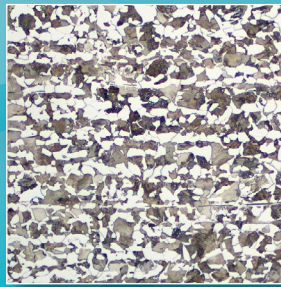


Demo Kit

– THE SMARTER ALTERNATIVE
TO EXPERIENCE OUR CONSUMABLES



We would like to thank you for taking the time to try out our consumables. The Akasel Demo Kit contains all necessary consumables to run the entire preparation method for the specified material.

The included suspensions will allow for preparing 25 - 50 samples, the grinding discs and polishing cloths will last even longer. This makes the Demo Kit a convenient and economical way of trying out an optimised preparation method in your own lab.

This method has been tested many times and we are confident that you will experience an improvement in your sample preparation. However, in order to achieve the best results, it is important to check the following things first.

Please note: Our Demo Kits are intended for use on magnetic support discs.

THINGS TO CHECK BEFORE YOU START

Magnetic Support Disc

It is important to check the planeness of the magnetic support disc.

Magnetic discs are widely used due to their user-friendliness. However, many people do not realise that a magnetic disc needs maintenance to function properly. The disc's magnetic surface is made from a soft polymer and the continued force at the center area will make the material flow outwards. Hence, over time the disc becomes hollow at the center.

Another issue is that the edge is continuously exposed to lubricant and suspension causing the soft polymer to swell over time making it higher at the edge.

These issues will cause scratches at the edges of your samples, prolonging each preparation step unnecessarily.

Therefore, it is recommended that you check the planeness of your disc regularly and correct it as described below if necessary.

Use a straightedge for inspection. Get a straightedge that can cover at least the distance from the centre to the edge of your magnetic disc, preferably the entire disc diameter.

Run the disc at 150 rpm with an ample supply of water. Use the dressing stick to remove the excess magnetic rubber and check with the straightedge that the disc is level. The dressing stick will get dark from the debris, but this will disappear when you dress an Aka-Piatto diamond disc.

Dosing of Diamond Suspensions

We recommend a dosing level of 0.5 - 1.5 ml/min of diamond suspension depending on the size of the disc and number of samples. To assure these values it is recommended to flush your automatic dosing system with an Akasel suspension and then do a dry run where you collect the suspension dosed by your system and adjust your settings accordingly. Most trigger sprays/manual dosing bottles dose approximately 0.5 ml per trigger activation.

The suspension should be applied about $\frac{1}{3}$ off the centre of the disc. In this area there is most frequent contact between samples and disc, resulting in a rapid distribution of suspension over the entire surface of the disc.

The Demo Kit contains the diamond suspension that is suited best for the material you prepare. This ensures a high material removal resulting in a short preparation time. The dosing level must be adjusted to keep the preparation disc moist but not wet. Excessive dosing will not result in shorter preparation time, on the contrary, the "hydroplaning" effect will extend the preparation time.

Force Setting

This is possibly where the most variance between different machines occurs. For various reasons you cannot expect the force setting to be accurate. Metallographic polishers use different principles to apply force, and manufacturers do not agree on a standard way of measuring the force. Furthermore, they all measure the force while the machine is at a complete stop, not while it is running. For this reason, 20 N on one brand may not be equal to 20 N on another brand.

Indications of too high a force are premature wear of grinding discs and polishing cloths and samples that are hot after polishing and have heavy scratch patterns. Too low a force will generally result in very long grinding and polishing times.

The force setting is proportional to the total sample area. The forces in our Aka-Briefs are stated for an individual 40 mm dia. sample. When working with samples clamped in a sample holder, multiply the force by 3, 6 or X, depending on the number of samples clamped at a time.

Positioning Samples and Sample Holders Relative to the Preparation Disc

For the fastest preparation result, the best surface quality and the longest consumable lifetime, both individual samples and the samples clamped in a holder should run over the edge of the preparation disc. About $\frac{1}{3}$ of the sample should pass over the edge.

SAMPLE PREPARATION

A preparation method typically consists of 3 - 5 steps. The purpose of each step is to remove the deformation created by the previous step and to improve the

surface finish. When testing a new method, it is of extreme importance to check the surface of your samples after each preparation step. This ensures that the finish is as required and the samples are ready for the next step. Otherwise you cannot be sure when artifacts were introduced and you might end up with a non-satisfactory final finish. The Aka-Brief enclosed with this Demo Kit shows pictures of the sample surface after each step, making it easier to identify a correct surface finish.

Plane Grinding

Your Demo Kit is likely to contain an Aka-Piatto diamond grinding disc for the first step. The Aka-Piatto is pre-dressed and ready to use. However, it has to be dressed with a dressing stick once in a while to ensure a continuously high removal rate. You do this by placing the Aka-Piatto on the magnetic support disc, let the machine rotate at 150 rpm and turn on the water. Use the enclosed dressing stick to remove the top layer. After this, the Aka-Piatto will provide high material removal again.

After grinding your samples for the recommended time they should have an even finish over the entire surface and be perfectly flat. The finish you can check visually and the flatness by using a straightedge. Possible errors on single samples are coarser scratches along the edge, resulting from an unplane magnetic disc. It can also be the consequence of too high samples. The height should be no more than $\frac{2}{3}$ of the diameter.

In a sample holder you can expect prolonged grinding times if your samples were not cut at a right angle, or if you did not level all samples correctly. Either relevel your samples or add a coarse Aka-Piatto 80 plane grinding step.

Fine Grinding

Your Demo Kit contains an Aka-Allegran or Aka-Largan disc for fine grinding. On these discs diamond suspension is added during use. Because of their effectiveness in bringing the diamonds in contact with the sample, they neither require a large amount of suspension nor any run-in time. With Akasel DiaUltra suspensions you should dose about 0.5 ml/min on a 250 mm disc. Less on a 200 mm disc and more on a 300 mm disc.

After the fine grinding step your samples should have an even, semi-shiny finish. If visible scratches from the grinding step are still present you will need to increase the fine grinding time. If the scratches are at the edge you might still have a problem with an unplane magnetic disc.

Polishing

Your Demo Kit will contain at least one polishing cloth. Because of their absorbent nature all new polishing cloths will require a certain run-in time, before the cloth works as intended and the removal rate is optimal.

There are 2 ways of doing so:

1. The fastest way to prime the polishing cloth before starting the preparation is with a diamond stick (enclosed) in the same grain size as the suspension to be used. Thus, the polishing cloth is ready for immediate use.

Rotate the polishing cloth at 150 rpm and move the diamond stick from the centre of

the disc outward to create a spiral pattern. Then start the preparation and apply diamond suspension as described above.

2. The traditional way of pre-dosing is with diamond suspension of 1 ml/min for 2 - 3 minutes and to run one or two dummy samples that are not needed for examination.

When running a polishing step, the recommended time should be followed quite closely. Extending the polishing time 2 or 3 times is not recommended, as this will most likely result in samples that are over-polished, showing rounded edges due to the long polishing time. However, if the samples still display scratches from the previous step after running the recommended time, you need to increase the polishing time.

Final Polishing with Oxide Polishing Suspensions

If your Demo Kit contains a final polishing step with an oxide polishing suspension, there are a few guidelines to follow. Even so, the Akasel oxide polishing suspensions do contain anti-drying agents, they will eventually dry out and can thus ruin the polishing cloth. Therefore, prior to oxide polishing, the cloth should be wetted with water until the holder touches the polishing cloth. For the last 10 seconds of the oxide polishing step, the polishing cloth should be flushed with water to clean both sample(s) and polishing cloth.

For detailed information on how to use the consumables correctly, please see the enclosed individual user guides.

Watch the videos we have on our YouTube Channel for more information on how to maintain the planeness of your magnetic support disc, how to dress an Aka-Piatto or how to prime a polishing cloth using a diamond stick.

