

# After-Sales-Service

Dr: Ulrich Ringleb

Sept. 15<sup>th</sup> 2010

*Customer service is the provision of service to customers before, during and after a purchase.*

*According to Jamier L. Scott. (2002), "Customer service is a series of activities designed to enhance the level of customer satisfaction – that is, the feeling that a product or service has met the customer expectation." ...*

*Customer service is normally an integral part of a company's customer value proposition. In their book Rules to Break and Laws to Follow, Don Peppers and Martha Rogers, Ph.D. write that "customers have memories. They will remember you, whether you remember them or not." Further, "customer trust can be destroyed at once by a major service problem, or it can be undermined one day at a time, with a thousand small demonstrations of incompetence." ...*

*One of the most important aspects of a customer service ... is that of what is often referred to as the "Feel Good Factor". Basically the goal is to not only help the customer have a good experience, but to offer them an experience that exceeds their expectations. Several key points are listed as follows:*

*1. Know your product – Know what products/service you are offering back to front. In other words be an information expert. It is okay to say "I don't know", but it should always be followed up by... "but let me find out" or possibly " but my friend knows!" Whatever the situation may be, make sure that you don't leave your customer with an unanswered question.*

....

*2. Anticipate Guest Needs – Nothing surprises your customer more than an employee going the extra mile to help them. Always look for ways to serve your customer more than they expect. In doing so it helps them to know that you care and it will leave them with the "Feel Good Factor" that we are searching for.*

*(Extract from Wikipedia)*

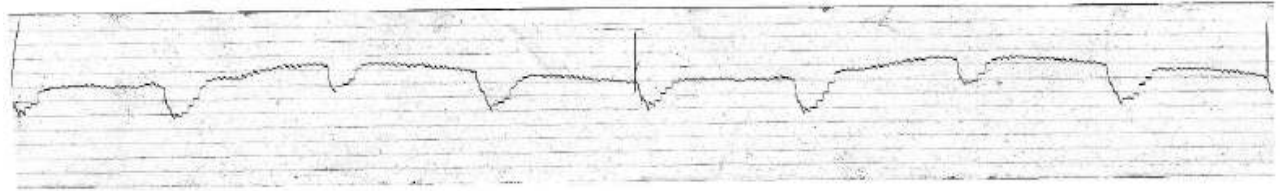
The name SCHUNK stands for quality and service. With this information we will highlight with a typical example the possibilities of SCHUNK for After-Sales-Service for Industrial and Traction Carbon Brushes.

“Carbon brush typical”, standard services like customer visits including collector and brush evaluation, check of out-of-roundness, temperature etc. will not be specially addressed.

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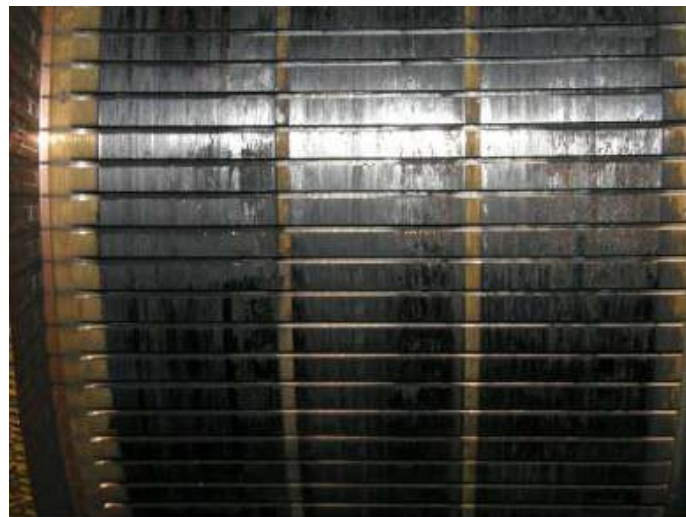
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## *Out-of-roundness diagramm*

In a printing shop a problem with extremely high brush wear appeared. The brush life time was 1 month only.

The commutator surface is described as „thick, black, dull, threaded, some burn marks, palpable commutator attack“.



It's supposed to be a problem of external influences, like harmful substances (e.g. oil) entering the commutator compartment.

The following methods of investigation can help to track down the cause of the problem.

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- At first the physical data of sample brushes are tested. .

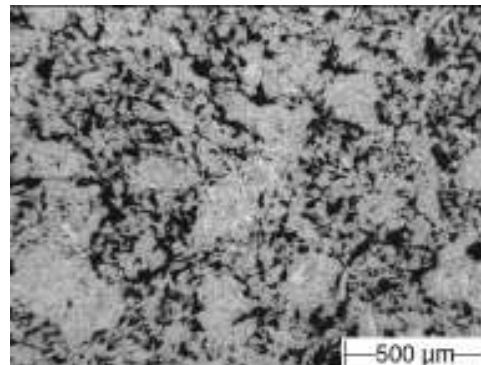


*Härteprüfung*

The specific electric resistance, the hardness, the bending strength, the apparent density and the content of contaminations are determined and compared with the set values. For metal containing brush grades the exact compositions can be checked by means of elementary analysis.

The analysis of microsections gives further clues.

Even more detailed insights are provided by scanning electron microscopy (SEM).



- In our chemical laboratory we check carbon brush dust for possible contamination.

This test is also possible with carbon brushes, but the test with a dust sample gives more accurate results.

The samples are extracted with an organic solvent. A potential residue is subsequently analysed by means of Infrared-Spectroscopy (IR), gas chromatography (GC) and other techniques. .



*Analysis in the chemical laboratory*

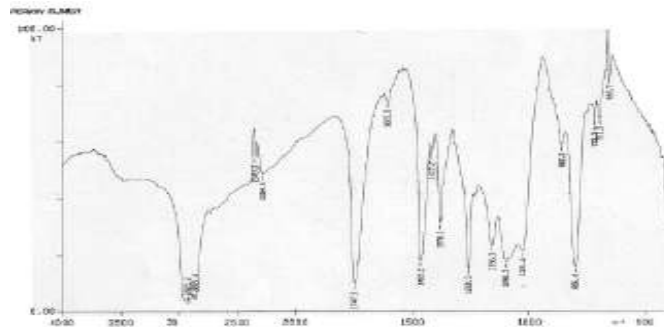
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Alternatively filter material can be checked.

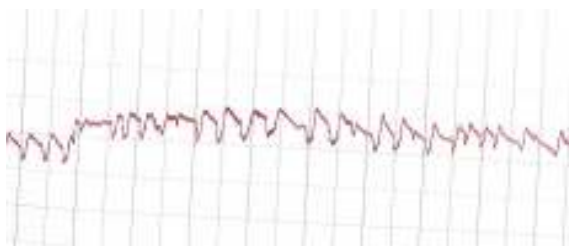
By means of this analysis potentially harmful substances can be detected quite exactly.



*IR- Spectrum*

- In case the chemical analysis gives some indication for the presence of substances with a negative influence on brush performance this suspicion could be confirmed by additional trials in our electrical laboratory. .

In a closed container carbon brushes are working with the influence of that suspicious material. Quite exactly a possible effect on brush wear can be concluded by means of the interpretation of voltage drop between carbon brush and collector and the measurement of brush wear. 50g of the substance are sufficient for this test.



*Typical progress of the voltage drop with external effects.*

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- A performance check of doubtful brushes is also possible on special test rigs.



The progress of the voltage drop and the friction coefficient and the brush wear as well are documented. The evaluation of the brush contact surface and the collector surface give valuable hints..

- The brush design is also examined in more detail. A check of the voltage drop between shunt wire and carbon brush supports conclusions of possible overload conditions. The adhesive connection of a brush top is characterised by a thermogravimetric method (TG) or by Differential Scanning Calorimetry (DSC). .
- Brush pressure is an important factor for the performance of carbon brushes. Spring systems of brush holders may age prematurely, bearings can become old.



*Bürstendruck-Messgerät*

SCHUNK can check complete brush holders in its test laboratories and subsequently give recommendations for necessary replacement.

All results together give a rounded picture and enable the field engineers to give customers a profound support – that's the way good after sales service is.



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## Compact

- Schunk offers perfect after sales service.
- Chemical lab, physical lab and electrical lab work hand in hand for exact analysis of possible problems
- Dimensional checks of brush holders and test of spring systems are possible.

Heuchelheim, September 2010