

# Techno-tbp on the rise

*Techno-tbp is becoming a successful company. The still new collaboration between the design agency Technolution and the producer of electronics tbp has already inspired various companies to become clients. It is a logical development to link design and production. This gives us a high level of synergy. If designers and producers of electronics support each other well, it will lead to the best results. It seems as if 1 + 1 is not 2, but 3, though mathematically speaking this is nonsense of course. Still, that's what it looks like.*



## In practice

Using an example, we will take you behind the scenes of Techno-tbp to show you what we mean by collaboration. We needed a small amplifier that needed to meet a number of very specific criteria for one of the machines that is manufactured at one of the large semiconductor factories in the south of the country. The amplifier is part of a control loop for the driving of an actuator. A list of requirements was compiled together with the client. The list contains not only the electrical specifications, but also the physical dimensions, heat regulation and so on. Alex van den Heuvel, project leader at Techno-tbp, explains how this project started: "Given the requirements, you know in advance approximately what the design will be. Years of experience helps in this because for some parts of the design you can use 'proven technology'. This gives a certain guarantee of a proper end product. At the same time, you can start on the ordering of particular components, which is handy given the often long delivery times." Sometimes a part circuit remains which must be thought through carefully. A test system must be made to demonstrate that this part works as it should.

## collaboration.

The final design can now be made in collaboration with the tbp engineers. While the primary requirements play a role, aspects such as producibility, availability of components, mechanical qualities and strength are also important. This entails ensuring DfM (Design for Manufacturing) and DfT (Design for Testability). Think of the possibility during

production of doing a boundary scan in accordance with the JTAG (Joint Test Action Group) standard, or adding control points for the flying probe test or ICT (In Circuit Test). The design is altered according to the given instructions until a fully production ready design is available. In this way two connectors are added to the above mentioned amplifier to measure the tension and all networks are provided with test pads for the flying probe test. Various checks also take place in advance to make sure that the product meets various preconditions. This includes heat regulation, EMI/EMC requirements etc. The finished design is the basis for the steps to be taken to manufacture the product. As the quantities are usually small, it means that work is done to immediately produce a "final end product". This means that much care is given to verifications and reviews to avoid any risk of errors. This saves time. The risks of large numbers of PCAs (printed circuit assemblies) are extremely high, but for small quantities the client can have the required product more quickly. The time to market thus is an important aspect!

## jumping in the deep end

Alex: "We then talk about the creation of an AM1 (Art Master 1), the first version according to the first time right principle. We can do this because we are very confident that the product is right. Before production we have used all sorts of tools to check and verify various aspects of functionality. During production all possible test facilities are used so that there is almost no chance of errors." Of course errors are sometimes made, but these are usually easy to correct. With a

couple of patches problems are quickly eliminated and the product meets the requirements. By definition, this work methodology is the most pragmatic. The amplifier has now been tested and works well. What remains now are the environmental test and shock & vibration tests to demonstrate the strength of the product.

## after care

The final schedule and all its associated features are then recorded in a way that is the norm for the client. In this case, the client receives all the information in its own standard for which the Mentor Graphics Tool chain is one of the tools used. The requirements document and the detailed design are also recorded in the client's required templates. All information can thus be seamlessly included in the client's documentation centre. This means total compatibility so that it looks as though the design was made in-house. The conclusion is clear: collaboration between designer and producer makes the manufacture of an efficient and high value product possible. The client has one point of contact: Techno-tbp. We call this service.



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