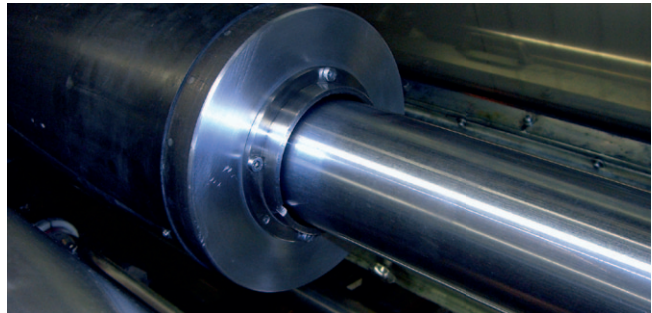
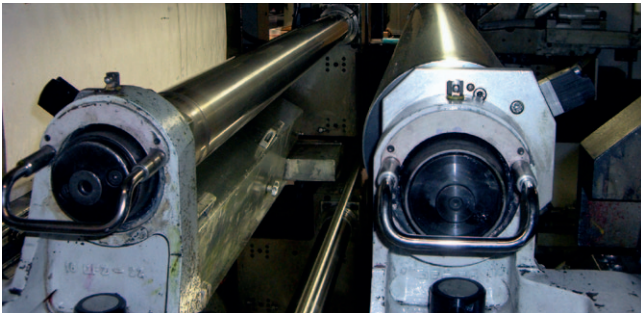


## STUDY CASE REPORT

### Crucial and important interface

World-wide on site services for printing press cylinders and CFRP adapters

The clamping area between the printing press cylinder and carbon fiber adapter influences decisively the flexographic printing image, the set-up times when changing adapters and process reliability of the entire system. For the first time there is now a service provider that specializes specifically on this interface. The global clamping and workholding technology specialists SWT Services from Ilsfeld (Germany) bundle more than 50 years of service experiences in the field of clamping / workholding and balancing technology. In cooperation with the leading printing press, adapter and clamping / workholding manufacturers they have developed a program that allows maintenance and repair directly at the machine. About 80 percent of all errors or problems that occur in this manner can be rectified on site.



SWT Services offers considerably contribution, to ensure that the cylinder and adapter generates a high precision system.

Modern clamping shafts / cylinders and carbon adapters enable high printing speeds, ensuring excellent stiffness, damping and optimal printing image. As with all precision mechanical systems, including the system of printing cylinders and adapters, the proper function depend on both correct operation and regular maintenance. Only when both factors are met can a consistent concentricity be reached within a micron-range for the modern flexographic (flexo) printing process.

#### ■ High precision hydraulic expansion system

When the operator is changing jobs in the flexo printing machine, he operates the clamping screw of a hydraulic cylinder – usually without knowing it – which is a high precision clamping mechanism. Externally hardly to recognize, the clamping screw moves the expansion piston located internally in the printing cylinder, which compresses hydraulic oil in the expansion chamber. The increase in pressure in the expansion chamber causes an expansion of the expansion sleeve on the base body. This procedure precisely clamps the carbon fiber adapter within its inner clamping surface. To ensure a perfect run, both the clamping surface of the cylinder and the clamping diameter of the carbon fiber adapter is precision ground.

## STUDY CASE REPORT



Grooves, rills, marks on the clamping surface of the cylinder and adapter can be one reason, that the adapter cannot be fitted smoothly onto the cylinder.

Hydraulic expansion solutions, such as those used in flexo printing presses, as well as in machine tools, are among the most precise clamping technology available. They are always used when frequent changing procedures and minimum change-over have to be permanently maintained with high precision. No other clamping system combines the factors of concentricity, minimizing setup time and flexibility as perfectly together as the hydraulic expansion system. The oil-filled expansion chamber and the expansion sleeve, when in operation in the printing process, act to damp vibration and absorb peak loads. Assuming the system does not get dirty or damaged, the clamping system ensures, even after several thousand of clamping cycles, perfect concentricity which is the basis for the flexo printing to achieve a clean print and high process reliability.

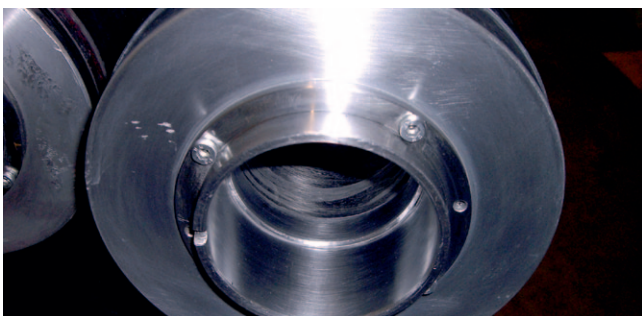


Dirt and surface damages on adapters effect directly the process safety in the flexo print.

„By the time carbon fiber adapters have to be removed from the printing cylinders by being struck with rubber hammers or blocks of wood the alarm bells should be ringing in the head of the in charge operating manager,“ says Oliver Pfeiffer, Managing Director at SWT Services. „Properly adjusted, cleaned and maintained, the adapter has to fit on to the printing cylinder very easily.“ A sluggish adapter exchange is therefore almost always an indication of problems in the entire system of clamping cylinder and adapter. The reasons differ: Frequent job changes under time pressure, improper operation and surrounding influences and other factors lead partly to enormous loads for the high precision interface. In a gradual process dirt and surface damages builds on the clamping cylinder / clamping diameter or deformation damages happens to the expansion parts, oil leakage happens in the clamping device, plus various other errors. The affects can be various: If the clamping force is too

## STUDY CASE REPORT

low, for example because the expansion rate of the cylinder size is not sufficient, the torque cannot completely be transferred to the adapter. This affects the printed image, errors occur and the reproducibility decreases. Sometimes there is even a complete machine failure. The clamping surfaces soiled or damaged, the adapter change significantly longer to complete. Adapter can fit barely and sometimes just go with brutal means. Due to the poor concentricity in this case the printed image and reproducibility suffers. Outside influences such as high temperatures in the press or in the hall can affect the clamping force and concentricity of the printing cylinders.



Cleaned, ground and measured all adapters can be easily fitted and precision clamped on to the clamping cylinder.



By using high precision measuring tools and calculating programs, SWT Services rates the complete system, consisting of clamping cylinder and adapter, right at the machine.

### ■ Print quality and process safety benefit

With SWT Services there is for the first time a vendor that specializes specifically in the area of clamping technologies and checks the complete system of clamping cylinder and carbon fiber adapter. The system can be maintained and in most cases repaired on site. Especially the maintenance and planned preventive maintenance plays a major role. „Who checks and maintains regularly the clamping cylinders and CFRP adapter, increases process reliability during operation, benefits from high print quality and reproducibility and minimize setup times, unplanned outages and scrap,“ said Oliver Pfeiffer. He recommends regular servicing and maintenance in a cycle of twelve months. By using high-precision measuring instruments the service specialists of SWT Services evaluate the complete clamping system (clamping cylinder and CFRP adapter) on site at the machine. Both, the absolute dimension of the clamping diameter and the clamping cylinder, as well as the roundness and expansion rate of the clamping cylinder, will be measured and checked. By using a special calculation program to compare the values of the adapter and clamping cylinder, the entire system can be evaluated, to make a statement if there is enough expansion rate of the clamping cylinder for reliable and precise clamping of the adapter. Warnings ensure that clamping cylinders or adapters can be replaced or repaired in time, before they cause equipment failures.



## STUDY CASE REPORT



After cleaning, checking and repair all clamping areas get measured to ensure proper function.

The service package offered by SWT Services is at a fixed price, including the examination of all surfaces for damage, checking and setting the expansion rate, cleaning, measuring and treating the inner clamping diameter of the adapter, cleaning the piston bore, cleaning and lubricating of all actuation screws and pistons as well as examination of all relevant functions, including the ability to fit the adapter smoothly onto the hydraulic clamping cylinder. An integral part of the on-site service is also an introduction to the machine operators and the preparation of an individual service plan. „It has been proven and shown that operators significantly treat the clamping cylinders and adapter correctly if they know the significance of the clamping system for the entire printing process,“ explains Oliver Pfeiffer. Thus, the service costs for the planned preventive maintenance are recouped within a short time.

To avoid costly downtime of the machine, SWT Services, as international full service supplier for the inspection and maintenance work, also provide their services on weekends, public holidays and during periods of machine shutdown.



Upon request, SWT Services also works on holidays, on weekends or within the time of a factory shutdown.



About 80 percent of all occurring failures can be eliminated on site.

## STUDY CASE REPORT

### ■ Comprehensive Manufacturer Workholding Technology Service

SWT Services focuses specifically on the services in the areas of workholding/clamping and balancing. They offer a global, multivendor service for workholding devices, such as for manual and power lathe chucks, zero point clamping systems and hydraulic expansion solutions, also including the clamping system of clamping cylinders and CFRP adapter for the flexographic printing process. The capacity ranges from installation through training and instruction of machine operators and staff members, maintenance and repair of clamping devices to regular or planned preventive inspections. The aim and objective is to permanently achieve the full potential of the clamping device, to reduce unplanned machine downtime to a minimum and to prevent damages to operators and machine. Within systematic clamping device monitoring and checking, even previously unknown damage such as internal damage can be found and analyzed. In addition a full service program with comprehensive balancing services for toolholders, tools and finished parts, is offered. Using advanced technology, the specialists ensure balancing of toolholders, grinding wheels, crankshafts, rotors, impellers, pulleys, flanges, tools, and more for a perfect run. This can all be done on-site, if necessary.

► [www.swt-services.com](http://www.swt-services.com)

## Comprehensive and Manufacturer Independent FULL SERVICES FOR CLAMPING AND BALANCING TECHNOLOGY



### ■ Independent consultation

We offer advice independently as a full service partner and comparing any manufacturer due to a wide range of technological overview and detailed know-how.

### ■ Distribution of all market leading brands

To implement solutions practically and fast, we sell the necessary parts and products directly to ensure the best possible cost-benefit effect for our customers.

### ■ Installation / Assembly / Start-up

Installation, assembly and product start-up gets done worldwide only by our own trained and qualified employees.

### ■ Training

Our specialists improve your operating staff based on actual practice training on how to handle the product properly and to avoid damages.

### ■ Maintenance

To make the maintenance of your products projectable, we do regular maintenance services based on fixed pricing including inspection.

### ■ Repair

Fast, competent and uncomplicated repair services to ensure fast recovery of your manufacturing capability.

### ■ Inspection

Our inspections lead to clear statements about the actual and real product condition in your production to avoid unnecessary machine breakdown.

### ■ Fine balancing

All kinds of tools, toolholders and workpieces reliable and precise by our experts on site or in our facility.

### ■ Worldwide on site

Germany, Europe or worldwide – we are there at any time and at any place of the world – ready for servicing!