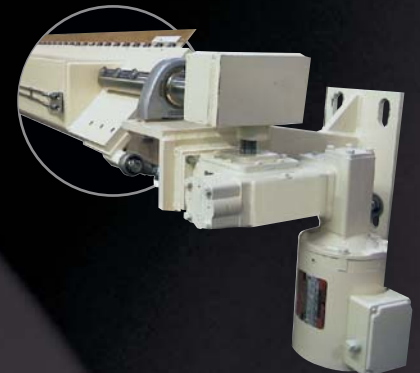
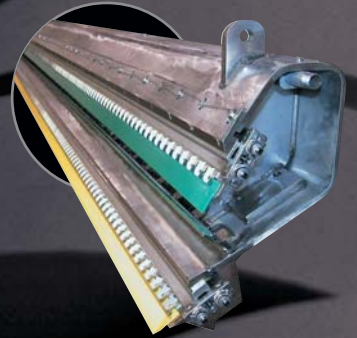


D O C T O R S Y S T E M S





Essco, Incorporated: Trusted for Performance

From a small, one-man sales agency in 1939, Essco has grown over the years into the industry leader in precision, high performance doctoring technology. Incorporated in 1965 as the Engineering, Sales, and Service Company, Essco expanded its services by adding professional engineers and experienced machine designers.

In 1969, manufacturing began at Essco, and our operations have steadily increased through several major plant expansions. Today, Essco has one of the most modern facilities in the industry, manufacturing doctor systems for some of the world's largest paper machines. Essco has produced thousands of doctors and doctor blades. Our technical staff and sales organization cover the entire USA, as well as Canada, Mexico, and many other countries in Europe, South America, and Asia.

Engineering

Essco has its own experienced engineering and design staff which produces custom engineered doctor systems for specific

applications. Our designers have worked in paper mills alongside millwrights and many have come to Essco from previous positions in the industry. This experience allows Essco to design doctor systems with high performance, ease of installation and maintenance, and reliability. Engineering drawings and designs are produced with the assistance of current CAD software.

Manufacturing

Essco has continually enlarged its manufacturing capabilities, keeping pace with our customers' changing needs through plant expansions, new and larger machinery, and modern CNC equipment. Our machining procedures and quality control assure you of the highest quality products. Industry surveys consistently place Essco product quality at the top of the doctor business. Our capabilities include precision machining, fabrication, welding, and stress relieving of mild steel and stainless steel systems...all vital to high quality doctor systems production and performance in your mill.

DOCTOR APPLICATIONS

Efficient doctoring is an important element in paper machine productivity. Doctors are required in many positions to remove contaminants, lead the sheet during threading and breaks, remove water from rolls, as well as specialty functions such as creping and coating. Essco is a leader in the doctor industry, and has supplied thousands of units throughout the world, on some of the world's largest and fastest paper machines, and in other industrial processing plants. Some critical applications include:

Center Press/Top Press TwinFlex™ Double Doctors

Essco designed and manufactured the first twin-blade press doctor in North America, installed in 1987. While competitors have since followed our lead, Essco double doctor systems remain at the forefront of design technology.



Doctor assemblies consist of several sub-systems:

Doctor Back

The doctor back functions as a main structural cross-machine support beam. Essco doctor backs are designed taking into account strength, vibration, deflection and space requirements of each application. Every Essco doctor back is precision machined to within thousandths of an inch of surface parallelism and crown targets. Doctor backs can be supplied in solid stainless steel, mild steel clad with stainless steel, or painted mild steel.

Blade Holder

Essco offers numerous rigid, conforming, and specialty holders. Models are illustrated on the following page.

Support and Mounting

Doctors are supported by journals, bearings, and custom mounting brackets. Essco offers several bearing models according to doctor weight and use of oscillation.

Loading Devices

Each doctor is positioned and/or loaded against the roll by an air cylinder system, adjustable torque arms, or a spring loaded pressure rig. Loading device selection is dependent on the application, amount and precision of loading pressure, as well as cost and maintenance considerations.

Oscillation

Doctor performance is improved by the addition of oscillation. Electromechanical or pneumatic systems are available to provide continuous, smooth oscillation for any size doctor.



Suction Roll Double Doctor Systems

The development of suction roll double doctors has been a significant advance for papermaking, improving sheet uniformity, reducing maintenance, improving energy efficiency, and increasing runnability. Double doctors on couch, grooved, blind-drilled, and suction press rolls can improve operations and offer rapid payback.

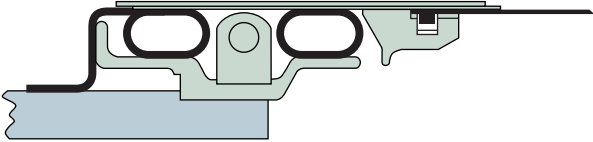
ETU OraCrepe™ Yankee Doctors

Critical to tissue and towel grade production, Essco Yankee doctors can be supplied with the heavy-duty pneumatic OraCrepe holder, proven in wide use throughout USA and Europe.

ETUniform™

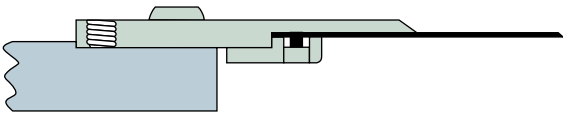
Essco's ETUniform represents the latest advance in conforming blade holder design. It provides uniform blade pressure along all points of the blade holder.

This results in even cross-machine blade loading pressure against the roll. The unique design simplifies pressure tube changes by placing the pressure tubes against the smooth pressure plate surface. Essco's heavy-duty mounting plate, pressure plate, and solid stainless steel blade support fingers withstand tough operating conditions imposed by critical doctor positions.



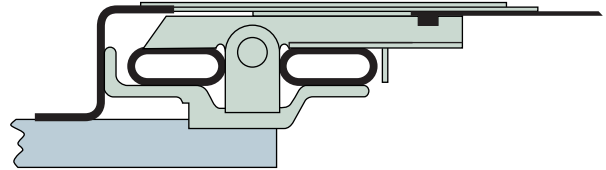
RJG III™

A proprietary Essco design for use on dryer doctors or other locations where dirt and stickies clog other blade holders. Segmented, release-coated blade support fingers with curved surfaces minimize build-up and clean easily. Direct bolt on replacement for KF-35A and most other rigid or semi-rigid blade holders. Equipped with micro-adjusting screws. All 316 stainless steel construction.



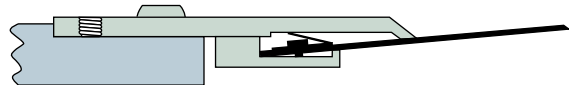
ETU-Oraflex™

The original, Euro-design, Essco-manufactured pneumatic self-conforming blade holder. Proven in thousands of applications worldwide, this holder is suitable for any application, but typically is used to replace similar OEM holders on doctors that cannot be easily adjusted to newer model ETUniform holder dimensions.



KF-35A

Widely used as the industry standard for rigid style blade holders, and suitable for most doctor positions. The KF-35A has micro-adjusting screws for profiling blade-to-roll fit, and accepts virtually any blade thickness. All 316 stainless steel construction.

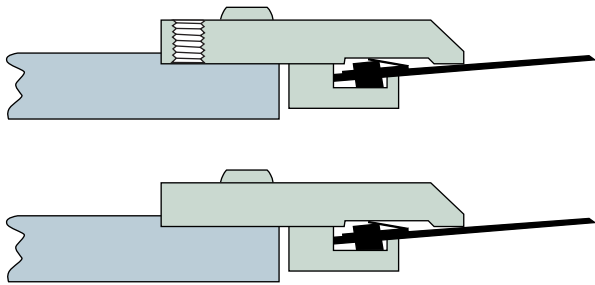


KF-45A/KF-55

Heavy-duty holders for high loading applications such as Yankee cut-off doctors, double drum or flaking positions, and other industrial processes.

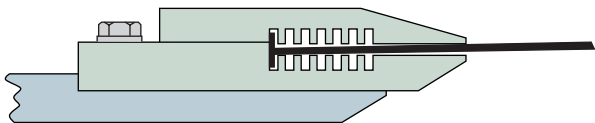
KF-45A slightly more economical and equipped with micro-adjusting screws.

KF-55 more massive for higher load applications. Not equipped with micro-adjusting screws as heavy-duty construction limits effectiveness of screws.



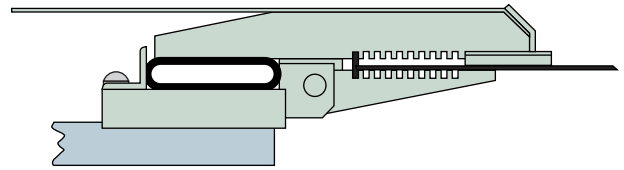
Ladder Holder

Rigid holder design for Yankee creping, cleaning, and cut-off doctors. Ladder slots and adjustable position lifting strip allow for changing blade width as blades are reground. Heavy-duty stainless steel construction.



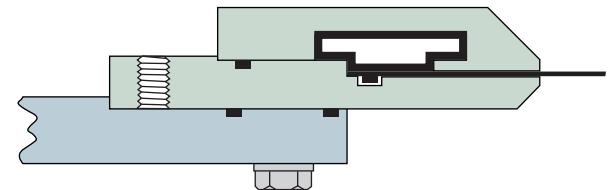
ETU-OraCrepe™

A heavy-duty, self-conforming, pneumatic tube loaded holder for high load Yankee creping and cleaning doctors. Open construction and high-temp fabric cover simplifies maintenance and limits dust accumulation in holder. Excellent conforming ability without the need to fine-tune with cross-machine adjusting screws. Includes tube depressors for blade-end adjustment. Lifting strip with step-style blade slots allows for varying blade widths if blades are reground.



AquaClean™

A proprietary Essco design for water-lubricated wiping of soft coater backup rolls. Fully-sealed, with special air load tube and full-length seal rings to provide effective and leak-free cleaning. Heavy-duty, 316 stainless steel construction.



Doctor operation is dependent upon reliable and trouble-free parts and accessories. Bearings, loading systems, and oscillator units represent the majority of system-maintenance issues on doctors. Doctor backs, blade holders, and mounting brackets typically have service lives of many years. While load bearing and positioning equipment require more frequent replacement, Essco provides cost-effective, long-lasting, quality components that minimize doctor maintenance costs. This allows you to rebuild or replace components on a planned, preventative timetable.

Doctor Bearings

Bearings are an essential and critical element of doctors. Essco offers low-cost, self-lubricating bearings for smaller and/or stationary doctors, greaseable mid-range bearings with optional split housing designs, as well as fully-sealed cartridge style bearings, and proprietary, sealed cam bearings for long life on heavy, highly-loaded positions such as center press double doctors and Yankee creping doctors.

Many models are available with high-temp protective boots to further increase service life.

Essco offers industry-standard sizes of 1-3/4," 2-1/2," and 3-1/2" diameter, as well as custom sizes and models to replace other manufacturers' original equipment.



To ensure correct installation and maintenance in your mill, Essco provides detailed engineering drawings, available in printed or electronic format, an installation outline sheet, and our detailed "Pocket Guide to Doctor Installation and Maintenance" with each doctor.

Essco can also provide the services of one of our trained service engineers to supervise your new doctor installation.

In addition, Essco will work with your mill to develop a custom, on-going maintenance service contract, providing supervisory and/or mechanical labor for doctor alignment, performance trouble-shooting, and preventative maintenance.

Maintenance Tools

Essco has led the way in innovative and helpful doctor maintenance tools.

The Edge™

Essco brought doctor alignment into the electronic age with our patented (4,852,266) Edge digital angle gauge and level, now available in both the original 2-piece model with remote sensor head, and the compact Model SC one-piece unit.





Loading and Positioning Devices

Rigid doctors are loaded against the roll with either manual, spring-loaded pressure rigs, or pneumatic air cylinder systems. Conforming doctor systems are fixed in position with either torque arm assemblies or properly sized air cylinders that produce more force than pneumatic blade holders.

Essco offers light and heavy-duty pressure rigs, air cylinders to suit any size doctor, and proprietary all stainless steel torque arm assemblies with specially coated rod ends for trouble-free operation under any loading condition.

Oscillator Systems

Essco patented (3,750,228) the first self-contained pneumatic oscillator system over 30 years ago. Today, Essco offers our newest all stainless Essco-lator™ CRS model, available with reusable stainless steel faced-airmounts, as well as bearing-mounted systems where space is limited.

Essco also provides electromechanical gearmotor systems in several sizes, available to suit various electrical and operating environments.



ETUniform™ Service Kit

A useful accessory for maintenance of tube-loaded conforming blade holders, each kit contains our unique tube-puller clamp which speeds tube changes, a pneumatic tube stretcher, air tube clamps and end plug fittings, doctor levels and angle gauges, and a pneumatic line splitter for use during conforming blade holder alignment.

Doctor Blade Storage Cart

Essco doctor blade carts simplify storage, improve personnel safety, and reduce handling and the risk of potential damage to blades.



Essco Doctor Blade Applications

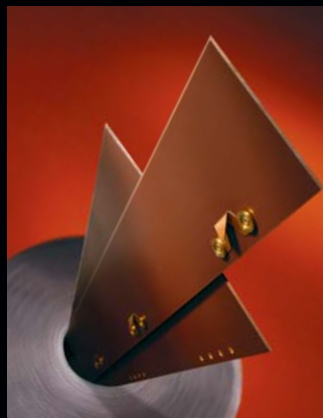
| Machine Section | Recommended Blades/Remarks | Angle/Load Pressure |
|---------------------------|--|---|
| Forming Section | Fiberglass/Excellent blade life, roll cleaning performance. Poly/Used on soft rolls, normally good life due to water. Micarta/Economical, may remove stickies better than poly. | 20°/0.5 pli |
| Press | Granite/Synthetics/Ceramic Fiberglass/Improved wear resistance over metal blades, mild polishing. Carbon Fiber/Best performance for enhanced blade and roll life. Stainless/Less commonly used in recent years, but still acceptable for some rolls. Soft Rolls Polyethylene/Over 10-15 P&J rubber and polyurethane rolls, good when lubricated. Micarta/Usually 1/4" thick on soft rubber rolls. Not recommended on polyurethane. | 25-30°/1-1.5 pli 20°/0.5 pli |
| Dryers | Fiberglass/Improved blade life, reduced roll scoring over metal blades. Carbon Fiber/Longest wearing, high flex resistance, excellent cleaning. Metal/Steel, stainless, bronze. Still used by some mills. Abrasive/For periodic build-up removal. Only on oscillating doctors. | 30°/1-2 pli |
| Calenders | Fiberglass/Excellent cleaning, improved blade and roll life. Carbon Fiber/Maximum blade life. Recommend oscillation. Metal/Steel, stainless or bronze. Micarta/Several grades available, including Spec 277. Inexpensive, but shorter life, less efficient. | 30°/1-2 pli |
| Reels | Fiberglass/Longer life than metal blades. Reduced roll scoring. Carbon Fiber/Greatest blade life. Metal/Steel and bronze commonly used. | 30°/1-2 pli |
| Other Applications | Contact Essco to discuss special situations (creping, printing, converting, non-paper related). | Varies |

Consult with your Essco representative to determine the best material for your particular application.

Essco has earned its reputation as the quality leader in doctoring systems by consistently providing our customers with superior service, value, and innovative, high quality products. Essco manufactures doctoring systems, doctor blades, creping blades, coater blades, blade holders (rigid, conforming & creping), oscillators (Essco-Lators & gear motors), The Edge™ electronic doctor gauge, forming board and foil covers, plus suction boxes, uhle boxes and covers...and provides doctor system consulting and service.

From initial discussion to quotation... through order, engineering, fabrication, installation, and subsequent service from your Essco Representative...you can count on Essco to help make your doctoring operation successful.

Essco doctors, or any doctors, perform best with Essco precision doctor blades. Essco's PRECISION DOCTOR BLADES brochure showing our many blade materials is available from Essco or from your Essco Representative.



Mission Statement

Essco markets, designs, and manufactures custom doctoring equipment, related products, services, and solutions for paper and industrial clients. We are an experienced, full-line supplier, responsive to customer needs and trusted for performance, that operates with integrity, profitability and stewardship of our employees and resources.

Represented By:



1991 Larsen Road
P.O. Box 10297
Green Bay, WI USA 54307-0297
Telephone: (920) 494-3480
Fax: (920) 494-3483
e-mail: essco@esscoincorporated.com
website: www.esscoincorporated.com