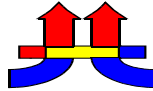


HUDSON PRODUCTS CORPORATION
COFIMCO USA



Hudson Products Corporation



Sterling Rhemann
scrhemann@hudsonproducts.com
Ph: (281) 275-8350
Fax: (281) 275-8388

Post Office Box 20029, Sugar Land, TX 77496-0029
(Main Office) 1307 Soldiers Field, Sugar Land, TX 77479
(Factory) 9660 Grunwald Road, Beasley, TX 77417

www.hudsonproducts.com

Date: 06/27/2008

CC: Nick Agius,

To Whom It May Concern:

Several factors influence the expected life of fan blades. There is no specific "life-span" of a blade that can be given, but here are some guidelines to be used for the Tuf-Lite® B-blades (black blades) in an air-cooled heat exchanger.

Fan blades on forced draft units have an expected life of 25 years. Fan blades on induced draft units are prone to UV attack, and therefore generally have reduced longevity compared to forced units. On an induced unit, the blades have an expected life of 20 years. When the blades turn a white/silver color and are fuzzy to the touch, the coating and first layer of resin is gone, and the UV begins attack on the fiberglass. This reduces the strength and will eventually cause the blade to fail. Other factors that may reduce the expected life are sand or water droplets through the fan, structure too close to the fan, or improper installation of the blade in the socket snap ring.

Refinishing blades is an option for extending the life of blades, as it will slow the UV attack on the fiberglass. There is risk with this option, because it will change the moment balance of the blades, and can cause serious vibration issues.

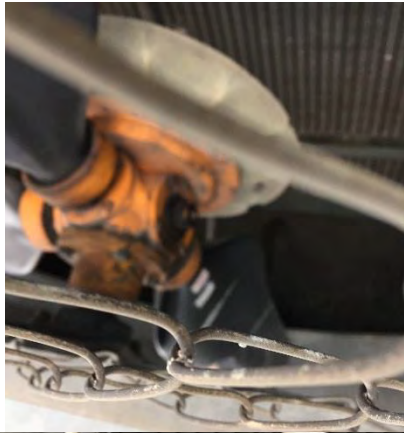
After these blades have been in service for several years, we sometimes have customers that would like to re-pitch the blades to increase productivity. Although changing of the pitch on a regular basis is fine, problems can arise if the pitch is left in one position for many years and then changed. If the blade is originally installed with even a little more pressure on one of the cap screws holding it in place, the fretting of the blade in the ring will indent into the resin in the neck. If the pitch is then changed, the blade will not seat fully against the ring, and can cause blade failure.

See Hudson engineering document ES-24.30 for more detail.

Sincerely,
Sterling Rhemann
Chief Fan Engineer
Hudson Products Corp

Old Tuf-Lite 1 style failure across Canada

So far, no recoded injury, fatality or fire that I know about



These pictures were collected by me. In each and every case it was not the fan blades fault. It is due to age and in-correct installation of a old obsolete design. The new Hudson C-clamp design that was introduced in the early 80's is what we need to upgrade towards. The above pictures are the first generation Tuf-Lite FRP fan. Hudson now have Tuf-Lite III, which is more efficient and more durable for less cost. It's time to upgrade older fans in our refineries and chemical plants to avoid an accident. Nick Agius

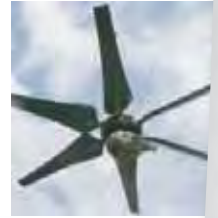
Fan wreck with old obsolete "B" style blades June 2017-Canadian Refinery;

The top three pictures are of the blade/hub that failed, the bottom two pictures of the other three blades that failed after the first fan blade whipped them out. This was an ID fan. Back in 2006 this same refinery had a similar B style fan failure that sent the ejected blade out the top of the fan ring and it flew in the air for a long distance. After this 2006 incident, it was recognized as a **safety risk** so this refinery engineered, and built top screens to avoid this in the future.

Another option would have been to buy new modern C-clamp Hudson fans and gain performance and safety, without the cost of top screens.



A History Built on Excellence



At HUDSON, we understand there is more to the design and production of fan blades than patented technology. We understand that there is more than establishing the highest standards in a manufacturing process, and we understand that there is more than providing the highest quality products and services to our clients – we understand that Hudson has a history.

A history developed over many years of producing the finest fan blades in the industry. We once again raise the standard with the introduction of the latest member of our famous Tuf-Lite® lineage.

With a history of fan blade production since 1955, Hudson continues to push the limits of axial flow fan technology.

Tuf-Lite III™

- HUDSON's Highest efficiency blade to date
- Developed from the most severe strength testing program to date
- One piece FRP construction
- Leading and trailing edge protection
- Superior "UV" protection
- Individually balanced, interchangeable blades
- Installs in current Hudson hub design
- Size ranges from 11 ft. to 14 ft. and 20 ft. to 10 meters in diameter



For more information on this or any other product, please contact:

HUDSON PRODUCTS CORPORATION

1307 Soldiers Field Drive, Sugar Land, Texas 77479-4072

Post Office Box 20029, Sugar Land, Texas 77496-0029

Phone: (281) 275-8300

Fax: (281) 275-8388

1-800-634-9160 (24 Hours)

E-Mail: HUDSONPRODUCTS@HUDSONPRODUCTS.COM

HUDSON Products Corporation

A Subsidiary of Hudson Products Holdings, Inc.

www.hudsonproducts.com