

# TECHNICAL BULLETIN – DDR19

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## **SUBJECT: CARE AND MAINTENANCE OF KNIFE BLADES**

### Knife Blades (also known as Doctors or Doctor Knives)

A heavy support runs parallel to each drum and supports a holder to mount a flexible sharp knife which contacts the drum to remove dry product from the rotating drum surface. The knife support pivots to raise the knife from the drums or to press the knife tightly to the drum surface. Movement and pressure of the knife holder is controlled by an air cylinder or manual screw adjustment.

Following are a series of comments aimed at helping you prolong the life and providing proper care to your knife blades:

### General discussion

A knife blade must maintain uniform contact with the drum using minimal but adequate pressure in order to perform its roll cleaning and/or sheet shedding function. Ideally, the loading method for the knife must be set at the lowest pressure that will provide you with the performance you desire to obtain. Doing this will maximize the life of the knife blade and will minimize drum wear, as well as the likelihood of damage to the drum.

### Operation and Maintenance

Achieving good knife blade performance requires:

- 1) A drum that is in good condition (a knife blade cannot overcome a drum that is in poor shape)
- 2) A properly designed knife blade
- 3) A properly installed knife blade
- 4) Proper maintenance
- 5) Proper operation at minimum pressure that will achieve the desired result

The following recommendations will help you have a trouble-free operation:

1. Do not modify, weld or machine the back of knife blades. Doing so may affect the integrity and/or performance of your knife blade system.
2. Blade material must be compatible with the material and hardness of the drum.
3. Always operate with minimum blade pressure.
4. Inspect for blade wear often. You should change blades before they wear about 15% of their original width (3/8" to 1/2" on a 3" blade).
5. Inspect blade holder slots during blade changes, and clean as necessary.
6. Check blade alignment periodically and examine worn blades for evidence of alignment problems. Alignment must be checked with drums in operating position.
7. Always use a new blade to check knife blade alignment.
8. Remove knife blades from service before exceeding its usual life. Establish a routine replacement schedule for knife blades.
9. Always replace a damaged blade or damaged holder.
10. It is recommended that you do not lower a knife blade onto a turning drum.

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11. Knife blades are machined for specific operating positions and conditions. DO NOT move a knife blade to another position without consulting your system supplier.
12. Do not increase blade pressure on a worn blade knife, as it may lift the blade tip and allow material to pass. Change the knife blade and observe the new blade before increasing pressure.
13. Don't forget to check auxiliary equipment for lubrication, interference or wear.

## **BLADE WEAR PATTERNS, CAUSE AND CURE**

### Blade Appearance and Symptoms



**Uneven wear, frequent blade change**

(Dramatization)

<b>Probable Cause(s)</b>	<b>Remedy</b>
a. Poor drum surface.	a. Use more flexible blade.
b. Damaged or dirty blade holder.	b. Clean, repair or replace holder.
c. Deposits.	c. Use abrasive blade.



**Excessive wear in center of blade**

(Dramatization)

<b>Probable Cause(s)</b>	<b>Remedy</b>
a. Knife blade not machined to match drum crown.	a. Refit and shim holder to knife blade back, as necessary (return new knife blade for re-planing if mismatch is excessive).
b. Old knife blade is sagging into (or away from) drum.	b. Replace old, sagging knife blade.



**Excessive wear at ends of blade**

(Dramatization)

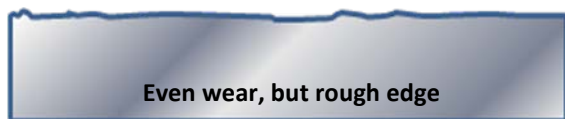
<b>Probable Cause(s)</b>	<b>Remedy</b>
a. Knife blade is misaligned and not parallel to drum axis.	a. Shim or remove bearings and brackets as necessary to align knife blade parallel to axis of drum.



**Excessive wear on one end**

(Dramatization)

<b>Probable Cause(s)</b>	<b>Remedy</b>
a. Deposits on drum.	a. Use abrasive blade as required.
b. Excessive pressure on blade.	b. Reduce pressure.
c. Blade material too hard.	c. Use a softer knife blade.



**Even wear, but rough edge**

(Dramatization)

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**Excessive wear in sheet run**

(Dramatization)

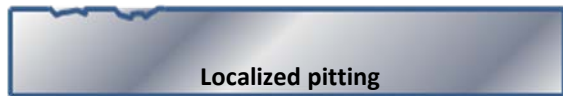
Probable Cause(s)	Remedy
a. Deposits left on drum by sheet.	a. Use abrasive blade as required.
	b. Trim knife blade edges frequently.
	c. Use end slotted knife blades in order to prevent build up of excessive pressure on drum ends.



**Excessive wear outside sheet run**

(Dramatization)

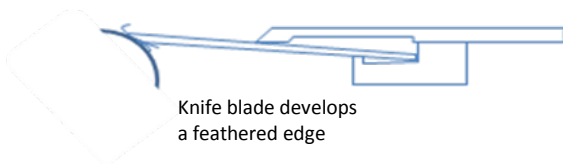
Probable Cause(s)	Remedy
a. Sheet lubricates drum.	a. Slot knife blade ends in order to relieve pressure.



**Localized pitting**

(Dramatization)

Probable Cause(s)	Remedy
a. Knife blade attacked by <ol style="list-style-type: none"> <li>1. Electrostatic discharge</li> <li>2. Electrolysis</li> <li>3. Heat.</li> </ol>	a. Insulate knife blade from machine frame or use a non-metallic knife blade.



Knife blade develops a feathered edge

(Dramatization)

Probable Cause(s)	Remedy
a. Knife blade material too soft.	a. Use a harder blade.
b. Excessive pressure.	b. Reduce pressure.
c. Blade angle too flat.	c. Move either bearings or brackets to increase angle. Check for correct angle with gauge.



**Hooks on knife blade outside drum surface**

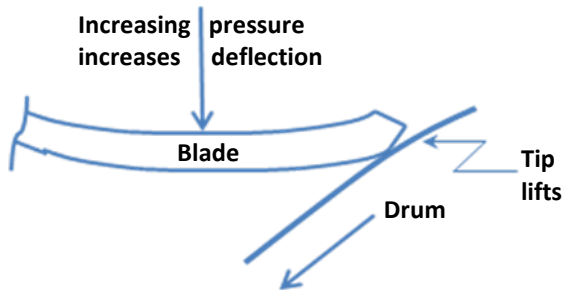
(Dramatization)

Probable Cause(s)	Remedy
a. Knife blade overhangs drum <ol style="list-style-type: none"> <li>1. Not centered</li> <li>2. Long</li> <li>3. Not oscillating properly.</li> </ol>	a. Center blade.
	b. Trim length, dub ends.
	c. Adjust oscillation stroke.

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(Dramatization)



Probable Cause(s)	Remedy
a. Knife blade caught scab on drum at start-up (most common on old dryers).	a. Change knife blade and remove scab.

Probable Cause(s)	Remedy
a. Knife blade pressure changed after initial wear-in; opens blade tip to trap particles and lift knife blade – may cause warp.	a. Reduce knife blade pressure, or change knife blade.

**Note: Always inspect worn knife blades for clues to any problems.**

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