

SHEARING ACTION OF THE TRIFLEX BLADES

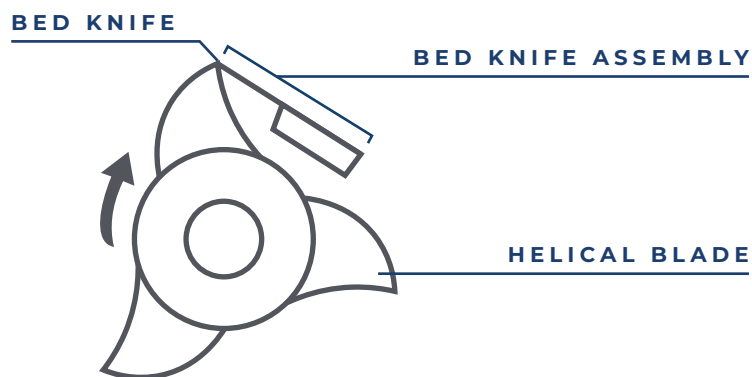
MOBIUS

TRIFLEX BLADE SYSTEM

THE NEXT GENERATION OF CANNABIS AND HEMP PROCESSING

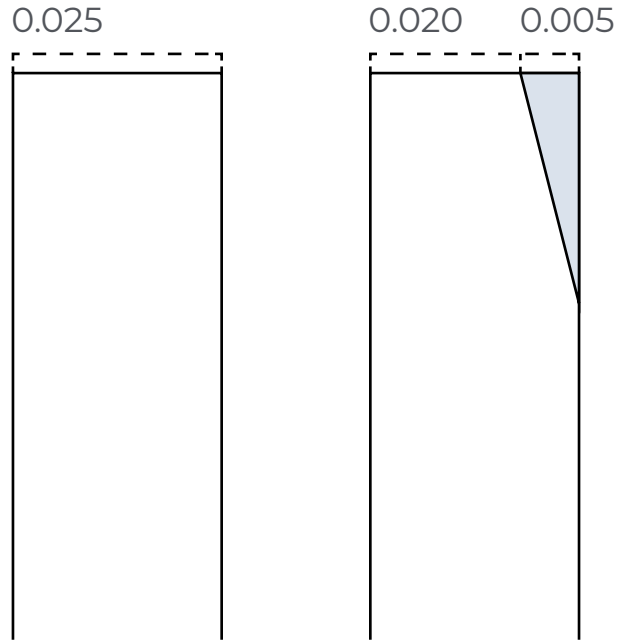
Wondering about metal-on-metal contact when using the Mobius Trimmer M108S? Below is an overview of how the Mobius TriFlex Blade System works and a breakdown of the numbers.

The Mobius TriFlex Blade System was designed to work just like scissors. Scissors are used when a job requires small, precise cuts, particularly in situations where the cut is being done unsupported (i.e. trimming with scissors in mid-air vs. cutting against a hard surface using a knife). Scissors have asymmetric overlapping blades that work through shearing action when the two blades flex against one another. At the point where the blades meet, the shearing contact between the two metal surfaces is what cuts the material.



Now that you know how the blades function on the M108S, let's have a closer look at the impact of the shearing action of the two metal surfaces against one another. When you first receive your M108S, the machine and the blades in the machine have been run-in for a minimum of one hour. Any spare blades will not have been run-in. As you operate the M108S for the first few hours, you will notice signs of shearing on the edge of the bed knife. This is normal and expected.

The TriFlex Blade System was designed with 5 thousandths of pre-load on the bed knife and it takes approximately six hours to reach full break-in to the pre-load. Throughout this six-hour period, the Mobius is moving 2,400 cubic feet per minute (cfm) of air for a total of 864,000 cubic feet. The total volume of bed knife loss (across all three blades) over the six-hour period is 0.0000087 cubic feet, which is the equivalent of 0.0000018 parts per million (ppm) or 1.8 parts per trillion (ppt)!!



$$V = 0.00000048 \text{ CU.FT.}$$

Situation	Imperial	Metric	
Mobius air flow	2,400 cfm	4,078 m ³ /hr	
Pre-load on bed knife	0.005 inch	0.127 mm	
Volume of bed knife loss through break-in period	2.9 x 10 ⁻⁶ cu. ft.	8.26 x 10 ⁻⁸ m ³	
Estimated break-in period	6 hours		
Volume of bed knife loss per hour during break-in period	4.8 x 10 ⁻⁷ cu. ft.	1.4 x 10 ⁻⁸ m ³	
Total air flow through Mobius over break-in period	864,000 cu. ft.	24,468m ³	
Bed knife material present during break-in period (per blade)	0.0000006 ppm	0.0006 ppb	0.6 ppt

To put 0.0000018 ppm in perspective, let's look at some relevant comparisons. The tables below outline regulated limits for various contaminants in drinking water (Canada), food (Canada) and pharmaceutical/drug products (European Union).

Drinking Water

SOURCE: GUIDELINES FOR CANADIAN DRINKING WATER QUALITY^I

SUBSTANCE	ALLOWABLE LIMIT
Arsenic in drinking water	0.01 ppm
Cyanide in drinking water	0.02 ppm
Lead in drinking water	0.01 ppm
Mercury in drinking water	0.001 ppm

Food

SOURCE: HEALTH CANADA'S MAXIMUM LEVELS FOR VARIOUS CHEMICAL CONTAMINANTS IN FOOD^{II}

SUBSTANCE	ALLOWABLE LIMIT
Mercury in fish	0.5 ppm
Melamine in infant formula	0.5 ppm

Pharmaceuticals and Drug Products

SOURCE: EUROPEAN MEDICINES AGENCY GUIDELINE ON THE SPECIFICATION LIMITS FOR RESIDUES OF METAL CATALYSTS OR METAL REAGENTS IN PHARMACEUTICALS SUBSTANCES OR DRUG PRODUCTS^{III}

[note: the elements listed below are those that are present in SS716, the material of the bed knife]

SUBSTANCE	ALLOWABLE LIMIT
Manganese	250 ppm
Chromium	25 ppm
Molybdenum	25 ppm

Conclusion: The shearing action of the helical blade against the bed knife during the break-in period generates a concentration of metal that is several orders of magnitude less than allowable limits of contaminants in substances for human consumption and, in fact, is so low as to be undetectable in practice.

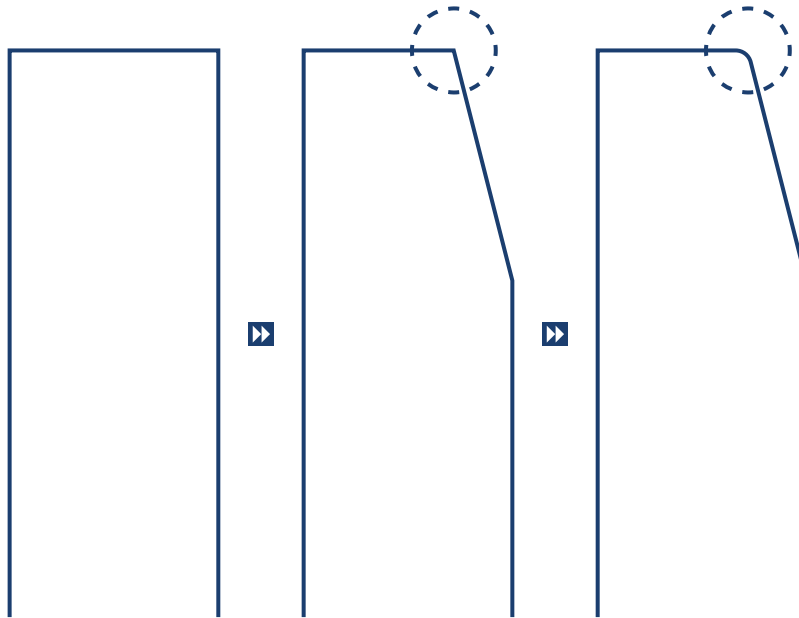
I <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/chemical-contaminants/maximum-levels-chemical-contaminants-foods.html>

II <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html>

III <http://academygmp-compliance.org/guidemgr/files/444600ENFIN.PDF>

What Happens After the Break-in Period?

After the initial break-in period, there is no further visible wear on the bed knife. Over time, though, the edge on the bed knife will begin to dull or 'roll', which happens to all knife and scissor edges.



The bedknives on the Mobius are designed as semi-consumables - once the edge begins to 'roll', it's time to swap out that bed knife for a new one. To determine if your bed knife edge has rolled, run the surface of your fingernail at a 45° angle across the blade edge. If the blade edge scrapes the fingernail surface, the edge is still good. If there is no scraping of the fingernail surface, the edge has rolled and the bed knife should be replaced*.

* Note: there is a 1/8" section at each end of the bed knife that will break-in and wear more quickly than the rest of the blade. This is caused by contact between the anti-dive disc on the helical blade and the bed knife. Rolling of this small segment does not indicate rolling on the rest of the bed knife edge and should not be used to determine if replacement is required.

