

Calculating the Total Value of Hygienic Machine Design

AKMH Motors for Food & Beverage Production Lines



KOLLMORGEN

Hygienic Motion for More Profitable Machines and Production Lines

To maximize profitability, food and beverage production lines must run 16–20 hours a day, every day, pausing only for the washdowns that ensure food safety and regulatory compliance.

But washdown itself can be a principal cause of motor failures that bring equipment to a halt. As sealed motors cycle between operating and ambient temperatures, a pressure differential forms that can pull water and cleaning chemicals past the seals and into the motor. Once contaminated, precision bearings fail quickly.

Even a single hour of unplanned downtime can cost a major producer tens of thousands of dollars in lost throughput, product waste, inspection services and replacement parts.

To protect motors during washdown, OEMs can provide permanent covers—adding to machine costs. Alternatively, production workers can install temporary bags and wipe down motors separately—adding to labor costs.

Kollmorgen's AKMH Series hygienic motors provide a better option

Eliminating the need for protective covers, AKMH motors are easier to build into the machine. Designed for direct washdown, they are easier to clean on the production floor. And with a seamless 316L stainless steel housing, plus continuous venting to equalize internal and external pressure, they provide superior hygiene and years of reliable operation in demanding food and beverage environments.

Are they worth the cost? Decide for yourself.

These guidelines for OEMs and producers can help you understand the total costs of choosing general-purpose or painted washdown motors that are prone to failure versus the value of AKMH Series hygienic motors specially designed for food and beverage production.

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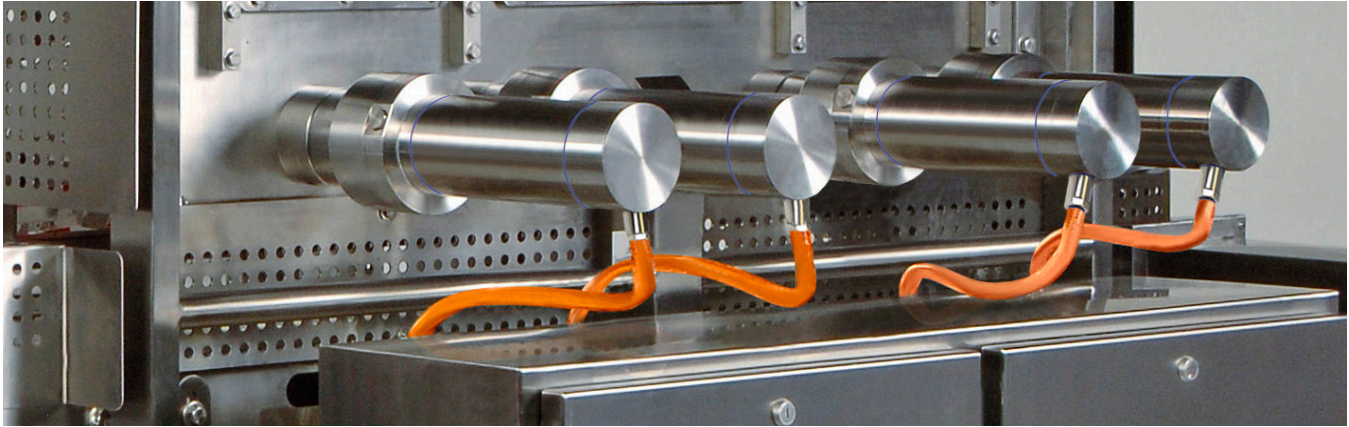
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Guideline A: OEM Costs and Savings for Hygienic Motor Design

These calculations are an example only, and not all cost categories may apply to you. We invite you to perform your own analysis, or contact your Kollmorgen representative to discuss your unique cost-saving opportunities.

CALCULATION STEP	EXAMPLE (4 MOTORS PER LINE)
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1. Motor protection costs.

Consider the material costs for each motor cover and the excess labor required to install the covers.

General-purpose or painted washdown motor

Material cost: **\$100 per cover x 4 covers = \$400**
 Labor cost: **\$80 per hour x 2 hours per cover x 4 motors = \$640**
 Total: **\$1,040**

AKMH hygienic

No covers required
 Total: **\$0**

AKMH savings: \$1,040

2. Cabling costs.

Consider the cost of each cable, plus the labor required to route the cables. AKMH motors are supplied with cables designed to withstand repeated washdown, so only labor costs apply. In addition, AKMH motors are designed to work with a single power/data cable when used with Kollmorgen drives, cutting installation costs in half.

General-purpose or painted washdown motor

Cable cost: **\$100 per cable x 2 per motor = \$800**
 Labor: **\$80 per hour x 1 hour per cable x 8 cables = \$640**
 Total: **\$1,440**

AKMH hygienic

Cable cost: **\$0**
 Labor: **\$80 per hour x 1 hour per cable x 4 cables = \$320**
 Total: **\$320**

AKMH savings: \$1,120

CALCULATION STEP

EXAMPLE (4 MOTORS PER LINE)

3. Cost of failed motors.

Non-hygienic motors can be expected to fail frequently, often due to water ingress caused by temperature/pressure cycling or paint chipping.

We assume a conservative failure rate of 50% over two years. Your records are likely to reveal a higher rate. By contrast, AKMH motors are warranted against ingress for a full two years.

We also account for the loss of customer goodwill. This is difficult to quantify, but considering the enormous costs of unplanned downtime, it should never be underestimated.

General-purpose or painted washdown motor

Cost of support: **\$50 per phone call x 2 = \$100**

Cost of support visit: **\$2,000 x 2 = \$4,000**

Cost of replacement motors: **\$1,500 x 2 = \$3,000**

Cost of shipping/handling: **\$150 x 2 = \$300**

Loss of customer goodwill per episode: **\$5,000 x 2 = \$10,000**

Total: \$17,400

AKMH hygienic

100% warranted against ingress for 2 years

Total: \$0

AKMH savings: \$17,400

Total value: \$19,560

4-axis machine incorporating AKMH

The cost savings that can be achieved far outweigh the modest incremental investment in AKMH hygienic motors over general-purpose or painted washdown motors.

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Guideline B: Food & Beverage Producer Savings for Hygienic Motor Design

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CALCULATION STEP	EXAMPLE (4 MOTORS PER LINE)
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1. Labor costs and line-production value per hour.

Begin with an understanding of your total labor costs per employee/hour as well as the value that each line produces each hour it is up and running. Many producers can deliver far more value than our conservative estimate.

Labor costs per employee/hour: **\$80**
 Production value per line/hour: **\$5,000**

2. Downtime costs

Estimate the number and duration of downtime events you can expect per year due to motor failures. Non-hygienic motors can fail in as little as a month under daily washdown.

AKMH motors are warranted for two years against ingress of washdown fluids and other failures.

General-purpose or painted washdown motor

2 downtime events at 2 hours each
 $\$5,000 \text{ per hour} \times 4 = \mathbf{\$20,000}$

AKMH hygienic

No downtime, 2-year warranty: **\$0**

AKMH savings: \$20,000

3. Cleaning costs.

AKMH hygienic motors can be washed down directly with the rest of the machine.

There's no need to bag motors, remove and replace permanent covers, or wipe down the motors by hand.

Estimate the time savings that can be achieved versus your current cleaning routine. Many producers spend far more time protecting and cleaning non-hygienic motors than our estimate.

General-purpose or painted washdown motor

Cleaning cycles per week: **2**
 Time to clean: **10 minutes**
 Yearly labor cost: **\$1,387**

AKMH hygienic

Time to clean: **5 minutes**
 Yearly labor cost: **\$693**

Total: \$693

AKMH savings: \$693, 8.7 hours

CALCULATION STEP

EXAMPLE (4 MOTORS PER LINE)

4. Repair costs within two years.

Lost production value is only part of the cost of downtime. Also calculate the cost of replacing motors that fail prematurely due to ingress of water and cleaning chemicals, including support costs.

General-purpose or painted washdown motor

Cost of replacement motors: $\$1,500 \times 2 = \$3,000$

Labor cost to replace motors: $\$80 \text{ per hour} \times 2 = \160

Total: **\$3,160**

AKMH hygienic

100% warranted against ingress for 2 years

Total: **\$0**

AKMH savings: \$3,160

5. Food safety costs.

Designed for easy, thorough cleaning, AKMH hygienic motors can reduce the risk of a massively expensive food recall. This estimate is based on the more common yet less costly risk of an intervention to ensure food safety in the wake of a positive test for pathogens.

General-purpose or painted washdown motor

Positive pathogen readings per year: **1**

Food safety intervention cost: **\$7,000**

AKMH hygienic

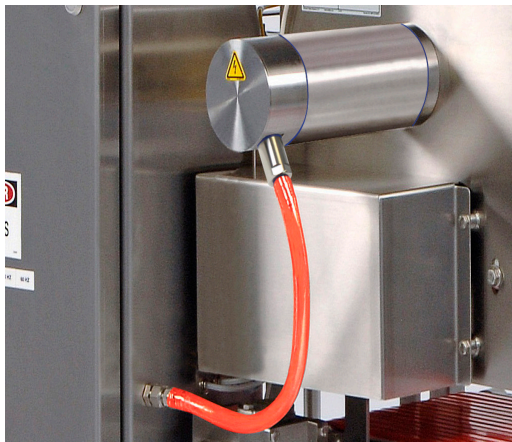
Simple, thorough cleaning

Minimal risk of motor-borne pathogens

AKMH savings: \$7,000

Total machine savings per year: \$30,853

4-axis machine incorporating AKMH



Food safety depends on thorough washdown. Profitability depends on returning machines to service as quickly as possible, with no surprises.

In addition to AKMH 316L stainless steel hygienic motors, Kollmorgen offers IP67 AKD-N decentralized drives, washdown-ready single-cable technology, vented cables and other solutions to help OEMs lower their total costs while providing customers with a more resilient machine that delivers significantly more value.

These calculations have been provided as a hypothetical example. For motor pricing and to get your personalized cost assessment, contact your Kollmorgen representative.

To learn more, visit www.kollmorgen.com/washdown