



INNOVATION YOU CAN APPLY

CSI Service Protocol: German Cockroach Control in Commercial Kitchens



INTRODUCTION

German cockroaches are one of the most common structure-infesting pests that Pest Management Professionals (PMPs) face. They have adapted to human environments and have a high reproductive output, which leads to rapid population growth in homes and kitchens around the world. Since they are a public health pest, it's essential to have an effective management strategy to control German cockroach infestations.

GENERAL INFORMATION

- German cockroaches are hemimetabolous insects that undergo incomplete metamorphosis. Their lifecycle progresses through 3 stages: (1) egg, (2) nymph, and (3) adult.
- Female German cockroaches carry the oothecae (egg case) until it is ready to hatch. A female can produce 5-8 oothecae in her lifetime, each containing 30-40 developing nymphs.
- German cockroach nymphs will molt several times before becoming an adult.
- At hatch and after each molt, cockroaches are white in appearance. It typically takes a couple of hours for the cuticle to harden and darken.
- German Cockroaches are highly opportunistic scavengers who will consume a wide variety of foods.



STEP 1. INITIAL ASSESSMENT

Consult with staff and management to gather information about the infestation and the areas where pest activity has been observed. Start by using a flashlight to inspect dark areas with high humidity or moisture. Common cockroach hotspots include kitchens, bathrooms, under and around appliances and equipment like refrigerators, stoves, ice machines, and dishwashers, near trash receptacles and other places where waste is disposed, near toilets, cardboard boxes, under sinks, and inside cabinets and storage areas.

Inspection Checklist:

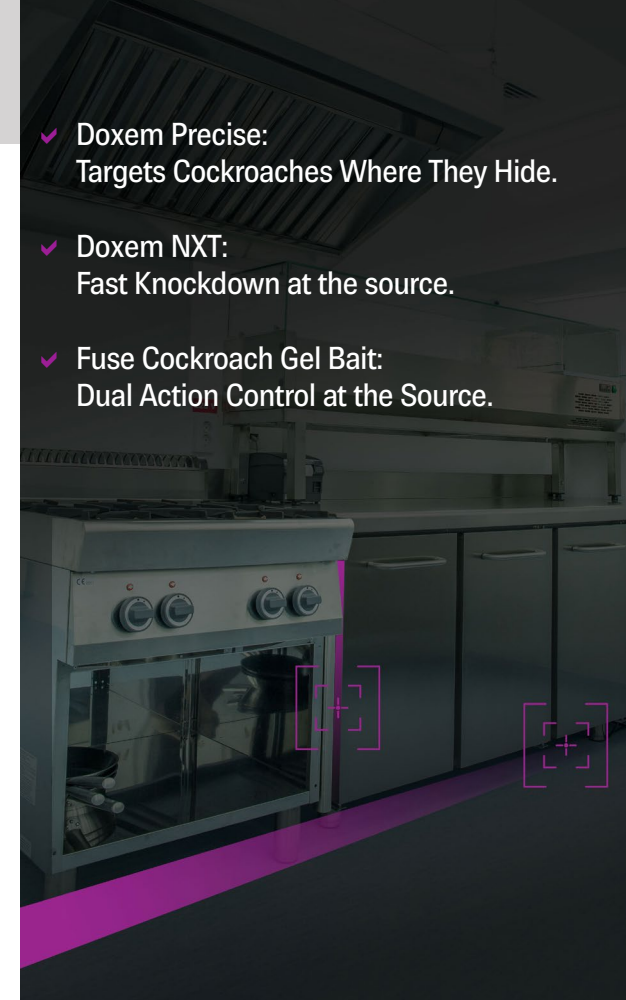
1. Evaluate overall sanitation and maintenance levels around the account.
2. Identify conducive conditions (e.g., moisture, clutter, improperly stored food, grease buildup).
3. Note areas where repair or mitigation may be needed (e.g., water leaks, structural gaps).
4. Look for cockroach signs and evidence as an indicator of population size and severity of the infestation (e.g., exuviae (shed skins), fecal spots, dead cockroaches, hatched oothecae, odor).
5. Make note of harborage areas and locations with evidence and activity.

STEP 2. IDENTIFICATION

Proper identification of the pest is essential. While German cockroaches are the primary concern in commercial kitchens, other species like American, Oriental, or brown-banded cockroaches may be present. Correctly identifying the cockroach will ensure a proper treatment strategy.



- ✓ Doxem Precise:
Targets Cockroaches Where They Hide.
- ✓ Doxem NXT:
Fast Knockdown at the source.
- ✓ Fuse Cockroach Gel Bait:
Dual Action Control at the Source.



STEP 3. IPM & NON-CHEMICAL CONTROL METHODS

Non-chemical control methods, including sanitation and habitat modification, are fundamental components of a cockroach management service. These tactics can help to reduce the population and support chemical control measures.

- **Vacuuming:** Vacuuming impacts the population immediately. Each live cockroach that's removed is one that won't have to be controlled with bait or other product applications. Since vacuuming removes cockroaches from a structure prior to pesticide application, it reduces the overall pesticide load which aids in resistance management efforts. Additionally, vacuuming removes debris, crumbs, dead cockroaches, and other food material that's supporting the population. Be sure the vacuum is equipped with a HEPA filter to help capture cockroach allergens.
- **Monitoring devices:** Sticky traps, glue boards, and other monitors can help with your assessment of population density and areas to focus treatment on. Additionally, sticky traps can assist with post-treatment evaluation and help to measure the success of the control program.
- **Customer recommendations:** Talk with the customer about improving sanitation and discuss how addressing those conducive conditions (moisture, clutter, cardboard storage, and competing food sources) will impact the overall success of your service.

STEP 4. CHEMICAL CONTROL METHODS

Disclaimer: Read and follow all label directions and restrictions before using any of these products and adhere to the federal, state, and local laws applicators are required to follow.

- **Using FUSE Cockroach Gel Bait**
 - In food areas, make applications to cracks and crevices only. In non-food areas, Fuse Cockroach Gel Bait can be applied into cracks and crevices or as a spot treatment. This gel bait may be applied while the facility is in operation. Do not apply to areas where food, food contact/preparation surfaces, or utensils can become contaminated.
 - Application:
Get bait should be used near harborage areas and places where activity is observed or suspected.

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FUSE® COCKROACH GEL BAIT



RATES:

° Areas to focus crack-and-crevice bait placements around include:

- Cabinets, door frames, and hinges
- Sinks and pipes (high moisture areas)
- Seats and dining areas
- Underneath tables, table legs, and casters
- Appliances and equipment (e.g., dishwashers, refrigerators, stoves)
- Mop closets and storage areas



- ◇ For gel bait applications under appliances and other similar areas, use bait with wax paper squares (2-3"):
1. Fold the wax paper squares in half to make a triangle.
 2. Apply a bead of bait in the center.
 3. Place the folded wax paper containing the bait into the appropriate location.
 4. Wax paper squares can easily be inspected, removed, and replaced as needed.

BAIT QUANTITY REFERENCE TABLE

Approximate weight per spot diameter	Approximate weight per bead length
0.1 gram = 1/4 inch diameter spot	1/3 gram = 1.5 inch bead
1.0 gram = Dime size spot	2/3 gram = 3.0 inch bead
1.5 gram = Quarter size spot	1 1/3 gram = 6 inch bead

- Light to moderate infestations: up to 1.5 grams of bait per square yard
- Severe or heavy infestations: up to 3 grams of bait per square yard
- ° Reminders, Tips, & Best Practices:
 - ◇ Gel baits are designed to be an attractive food source that cockroaches will readily feed on. Be aware of potential contaminants that could affect their palatability.
 - ◇ Look for and remove competing food sources.
 - ◇ Inspect placements, observe if it's been consumed, and replace as necessary to ensure bait remains available to control the population.
 - ◇ Numerous small placements are typically more effective than fewer larger placements.

USING DOXEM PRECISE DRY FLOWABLE & THE PRECISION DELIVERY SYSTEM (PDS)

In food areas, make applications to cracks and crevices only. In non-food areas, this product may be used to treat voids, cracks, and crevices. This product may be applied while the facility is in operation. Do not apply to areas where food, food contact/ preparation surfaces, or utensils can become contaminated.

- Application:
- Using the PDS, apply the bait for 3-8 seconds into cracks and crevices where cockroaches are observed. Areas to focus crack-and-crevice treatments around include:
 - Motor housings, compressors, drain areas of refrigerators, freezers, ice makers, and other kitchen appliances
 - Dining room area, bench style seating, table legs
 - Bar areas
 - Around convection ovens, microwaves, fryers
 - Cabinetry, cardboard box storage, and shelving
 - Garbage and waste disposal areas
 - Grease pits

RATES:

RATE	GRAMS OF DOXEM PRECISE APPLIED	AMOUNT OF TIME TO ACTUATE TRIGGER	TOTAL # PLACEMENTS IN 5 G CANISTER
Low	0.05 g	3 seconds	100
Medium	0.07 g	4 seconds	71
High	0.15 g	9 seconds	33

Light to moderate infestations: place bait in harborage areas, cracks and crevices with a minimum of 5-7 bait placements per 100ft².

Heavy infestations: treat harborages, cracks and crevices with a minimum of 10-20 bait placements per 100 ft².

PRECISION
DELIVERY SYSTEM

Doxem Precise
Dry Flowable



◦ Reminders, Tips, & Best Practices:

- ◊ Using the PDS, Doxem Precise can be applied up to 24" into a void, making this a great option to use in hard-to-reach areas that are not as easily accessible with FUSE Cockroach Gel Bait or aerosol applications.
- ◊ Doxem Precise acts as a bait and a dust so cockroaches are exposed through both contact and ingestion.
- ◊ Dry flowables are resilient formulations. They work great in warm areas around commercial kitchens with elevated temperatures, as well as in extremely cold conditions.
- ◊ During follow-up visits, inspect the treated area and reapply as necessary.

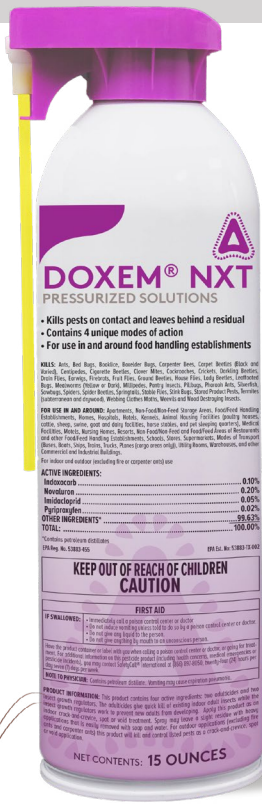
• **Using Doxem NXT Aerosol**

- In food areas, use as a crack-and-crevice treatment only. This product can be used as a crack and crevice and spot treatment in non-food areas. This aerosol may be applied while the facility is in operation. Do not apply to areas where food, food contact/preparation surfaces, or utensils can become contaminated.
- Application & Rates:
- Apply as a crack-and-crevice treatment where cockroaches may be harboring, living, or breeding including behind baseboards, sinks, cabinets, door frames, wall voids, plumbing chases, closets, and under sink cabinets.

- Place injector tip into cracks, crevices, holes, and other small openings for direct spray to target pests.
- Release approximately one second of spray per injection.
- Light infestations: 3-foot spacing
- Heavy infestations: 12-in spacing
- For linear cracks:
 - Light: three linear feet per second
 - Heavy: one linear foot per second
- Do not apply more than once every 7 days.

◦ Reminders, Tips, & Best Practices:

- ◊ Residual sprays provide prolonged protection by killing cockroaches that come in contact with treated surfaces.
- ◊ Doxem NXT Aerosol contains 4 non-repellent active ingredients, making it a compatible tool for use alongside baits like FUSE Cockroach Gel Bait and Doxem Precise Dry Flowable Bait.
- ◊ Cockroaches are thigmotactic, meaning they like to hide in tight spaces. Residual aerosols like Doxem NXT can be applied into these harborage areas and reach cockroaches that baits may miss, like gravid females who forage less.



PRODUCT DETAILS

Product Name	EPA Reg. No.	Pack Size(s) & No. per Case	Features & Benefits	Active Ingredients	IRAC Group
Doxem Precise Dry Flowable Bait	53883-438	20g box (4 x 5g cartridges) (12 x 20g boxes per case)	<ul style="list-style-type: none"> One application will last >1yr Withstands extreme temperatures Doesn't harden or get crusty When used with the Precision Delivery System, it's a consistent application with less wasted material 	0.6% Indoxacarb	22A
FUSE Cockroach Gel Bait	53883-456	1.16oz (33g) tube (12 x 33g tubes per case)	<ul style="list-style-type: none"> Dual-action cockroach gel bait Kills cockroaches for 6 months Labeled for applications with wax paper Kills cockroaches through contact and ingestion Effective against bait-averse cockroaches 	0.05% Fipronil 0.05% Abamectin	2B 6
Doxem NXT Aerosol	53883-455	15oz can (12 x 15oz cans per case)	<ul style="list-style-type: none"> First aerosol to contain indoxacarb First aerosol with imidacloprid for use in food handling Suitable for use with ant and cockroach baiting programs 	0.10% Indoxacarb 0.20% Novaluron 0.05% Imidacloprid 0.02% Pyriproxyfen	22A 15 4A 7C

CONCLUSIONS

It is well understood that resistance management is important when facing German cockroaches to ensure long-term effectiveness of the products PMPs use to control them. Insecticide resistance can happen over time with repeated exposure to the same class of insecticides, rendering products with those active ingredients less effective. Without a plan to manage resistance, German cockroach populations can become more difficult and expensive to control. A primary way to avoid this is to rotate and incorporate products with different modes of action into your service. The three products mentioned here equip applicators with 6 active ingredients in 6 different IRAC groups (which represents 6 unique modes of action). Using Doxem Precise, FUSE Cockroach Gel Bait, and Doxem NXT can help you in the fight against resistance and achieve success in your cockroach management service.

**Read and follow all label directions and restrictions before using any of these products and adhere to the federal, state, and local laws applicators are required to follow.*

Notes



Learn more about Doxem NXT, Doxem Precise featuring the Precision Delivery System, and Fuse Cockroach Gel Bait.



Doxem NXT



Doxem Precise & the Precision Delivery System



Fuse Cockroach Gel Bait



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