WERF Research Center Study Finds 80% FOG Removal Efficiency for Gravity Grease Interceptors (GGI) vs FGI's (Flow Grease Interceptor) 50% Efficiency

Executive Summary: Gravity Grease Interceptors (GGI) & Industry Standards:

The purpose of this document is to highlight and summarize the latest industry issues, data and current standards concerning fats, oils, and grease (FOG) removal for commercial food service establishments (FSE).

History: Studies show Gravity Grease Interceptors (GGI), are highly efficient in FOG removal with significantly greater efficiency when compared to Flow Based Gravity Interceptors (FGI) also known as traps.

Sited Expert Studies:

1. WERF – Water Environment Research Federation - Vol. 83, Number 9. Assessment of internal and external Grease Interceptor performance for removal of food-based fats, oils, and grease from food service establishments.

ABSTRACT: A research study was performed to determine the fats, oil, and grease (FOG) removal efficiency of internal flow-based grease interceptors (FGI). A passive-flow and a mechanical-flow FGI unit were tested and their performance was compared to an external retention-based grease interceptor (RGI). Experiments involved multiple parameters including three oil/water emulsion strengths, two influent liquid temperatures, and two flow rates. Overall, the RGI achieved approximately 80% FOG removal and the FGIs removed less than 50% under the tested conditions. One exception occurred during the passive FGI testing during which removal reached approximately 80%. This increased efficiency was likely due to the relatively weak emulsion exhibiting significantly large FOG globules. The FOG removal efficiency decreased with increased temperature because of increased breakage of FOG globules at the elevated temperature. These results suggest that emulsion strength significantly affects FOG removal efficiency of FGIs and should be considered in future manufacturer testing protocol. *Water Environ. Res.*, **83,** 882 (2011).

KEYWORDS: fats, oils, and grease, grease interceptor, grease abatement system, grease retention device.

Authers: Erin Gallimore, Tarek N. Aziz, Zohreh Movahed and Joel Ducoste

Highlights: "Overall RGI's achieved approximately 80% FOG removal and the FGI's removed less than 50% under the test conditions."

Acronyms & Data points:

FGI - Flow Based Grease Interceptors (i.e.) Traps
FOG - Fats, Oil and Grease
FSE - Food Service Establishment
GGI - Gravity Grease Interceptors – As Classified by ASTM C1613-2021 (Same as RGI)
HRT - Hydraulic Retention Time
MFGI - Mechanically Based Grease Interceptors
PFGI - Passive Flow Based Grease Interceptors
RGI - Retention Based Grease Interceptors (i.e.) Gravity Grease Interceptors
WERF – Water Environment Research Federation

Other factors to be considered:

Residence Time - (i.e.) Retention Time: 30 Min. (GGI) vs. 30 Sec. (FGI)
Temperature
FOG Waste Concentration

GGI Interceptor Definition:

GGI Interceptors protect the drainage and sewer systems from the introduction of substances that might be harmful to those systems. An interceptor is a device designed and installed to separate, retain, and treat deleterious, hazardous, and undesirable matter before they enter the sewer system. Normal sewage or liquid wastes bypass these devices and discharge into the sewer system via. alternate sewer line.

NYS Codes for Gravity Grease Interceptors:

Currently NYSPlbg. Code follows the (UPC) Uniform Plumbing Code
2003 UPC - Uniform Plumbing Code Appendix H Sizing Method: Table H1
The above recommended sizing and methodology.
Precast Concrete GGI's meet all requirements.

References:

DESIGN CONSIDERATIONS AND DISCUSSION OF PRECAST CONCRETE GRAVITY GREASE INTERCEPTORS - NPCA WHITE PAPER - 2021
UPC 2003 - Uniform Plumbing Code Appendix H Sizing Method: Table H1
ASTM C1613-2021

WERF - Water Environment Research Federation - Vol. 83, Number 9.
Assessment of Internal & External Grease Interceptor Performance for removal of Food-Based Fats, Oil, & Grease from Food Service Establishments.

For more information contact:

Michael J. Kistner, VP
Kistner Concrete Products Inc.
O: 716-508-5594
E: michael.kistner@kistner.com