ALLTRAP
ENGINEERING cc

# GREASE TRAP

## OPERATION & SPECIFICATION

Manufacturers of grease and oil separators and rainwater harvesting

# What is a grease trap?

A grease trap (also known as a grease interceptor, grease arrestor or food and oil interceptor) is a holding tank with a number of baffles. It is specifically designed to slow the flow of warm/hot greasy wastewater from commercial kitchens and food preparation areas allowing the wastewater to cool. As the water cools , suspended fats, oil and grease from day to day cooking separate and float to the top, solids settle on the bottom and the cleaner and cooler water is discharged to sewer.

The floating fats, oil and grease and the settled food solid will accumulate over time. This means your grease trap will need to be pumped out at regular intervals by a licensed trade waste collection contractor. The frequency may range from several weeks to several months. The licensed contractor will use a suction pump to remove all of the contents and wash and scrape the walls and baffles of the grease trap. Installing a larger grease trap may reduce the frequency and ongoing cost of
pump outs.

## Which businesses require a grease trap?

Retail food businesses that cook or serve hot food will need to install a grease trap. Waste water from food preparation areas, floor wastes, kitchen sinks, dishwashers and garbage areas should all flow into the grease trap.


## Typical businesses include:

Bakeries
Butchers
Cafes
Catering companies
Commercial kitchens
Fast food outlets
Food manufacturing facilities
Function centres
Hospital, nursing home kitchens
Hotel, motel kitchens
Pre-packaged food wholesalers
Restaurants
Shopping centres (with food shops)
Take-away outlets

## Why does my business need a grease trap?

By law, local water authorities require that all fats, oils and grease from all commercial food preparation businesses must not be discharged to the sewer system. A grease trap is required to prevent most fats, oils and grease from entering the sewer system where they can solidify and build up to cause blockages, overflows or overload wastewater treatment plants.

It is also important to prevent hot liquids from entering a plastic (PVC) sewer system. The pipes can melt and buckle if the wastewater discharged to sewer is too hot.

## Does your grease trap need to be an approved design?

Water authorities throughout South Africa set the design specifications for grease traps. ALLTRAP grease traps are approved for use in virtually all regions of South Africa. We will supply the correctly designed grease trap for your particular locality.

# Functioning

In addition to proper maintenance and operation, there are three key characteristics that affect the functionality of gravity-type grease interceptors: retention time, flow and storage capacity.

## Retention Time

Grease and oils have a lower specific gravity than water, so when a grease-laden mixture is left undisturbed, they will float to the surface while the sediment settles to the bottom. Grease separators use baffles and/or compartments to detain wastewater long enough for this process to occur. The Uniform Plumbing Code (UPC) recognizes a retention time of 30 minutes.

## Flow

The grease separators must be sized and configured to allow for sufficient retention time, taking into account the flow rate of the influent. Furthermore, it must be configured such that it minimizes turbulence to allow the suspended FOG to separate. This is especially important in high-flow situations, such as in the draining of a large sink or the discharge of dishwasher water.


## Storage capacity

The separator must be large enough to allow for sufficient storage of accumulated FOG between cleaning operations without affecting the flow characteristics through the unit.

# Kitchen Practices & Operation

There are no moving or mechanical parts in gravity - type grease separators that require operation or adjustment. Thus, the passive operation of the interceptor is affected by the way in which it is used and the substances that are allowed to enter it. The following kitchen practices will reduce interceptor maintenance costs:

• Establish Best Management Practice standards in the kitchen to minimize FOG discharge.
• Educate and train your staff in proper kitchen practices. Some regulatory agencies require proof that employees have been trained and comply with such practices.
• Keep records of maintenance on site. Most authorities require proof that the interceptor has regular maintenance.
• Post "No Grease" signs above sinks and other drainage fixtures.
• Dry-wipe pots, pans and dishware prior to washing.
• Use a 3-sink system with separate sinks for washing, rinsing and sanitizing.
• Use dishwashing and general cleaning detergents that promote rapid oil/water separation. These detergents are formulated to release oil quickly so that the oil can rise to the water surface instead of remaining emulsified.
• Use proper concentrations of cleaners and disinfectants. Excessive amounts of either can cause FOG to become emulsified and pass through the interceptor.
• Do not use water that is hotter than necessary to clean and sanitize wash items. Use temperature settings recommended by the dishwasher manufacturer.
• Do not dispose of cooking oils, fats or grease into drains. Recycle waste cooking oils.
• Do not use additives such as enzymes, grease solvents or emulsifiers. Most regulatory agencies prohibit their use. Enzymes and solvents temporarily emulsify grease, allowing it to pass through the interceptor. The grease later coagulates on the inside walls of sewer pipes, restricting flow, which could result in sewage backups and blockages.
• Do not allow corrosive agents to drain into the grease interceptor.
• Do not use food grinders. Most regulatory agencies prohibit their use. Dispose of food waste into a solids waste container. Although the separator is designed to remove grease-laden food particles from the wastewater stream, it also increases the pump-out interval and could lead to potential odour and/or reactivity problems due to food particles breaking down biologically and releasing gases within the interceptor.

# Odour Prevention

Odour issues with outdoor separators can be eliminated when a properly designed grease separator is incorporated into the building's plumbing/venting system. Most building codes require the separator to be vented back through the inlet plumbing and to a roof vent. In almost all cases odour problems are caused by improper venting of the building's plumbing system. This causes the gases to build up in the separator and allows them to escape, leading to odour problems. Proper building ventilation and separator design along with gastight manhole covers and seals will prevent odours from escaping the separator and allow them to properly escape through the roof vents. Additionally, when gravity grease separators will be dormant for more than 30 days (schools, churches, etc.), the preferred practice is to pump and refill the interceptor with clean water before the long period of inactivity.

# Stainless Steel Material

## General Properties 304 Stainless Steel

All Trap Steel Type 304 is a variation of the basic 18-8 grade, Type 302, with a higher chromium and lower carbon content. Lower carbon minimizes chromium carbide precipitation due to welding and its susceptibility to intergranular corrosion. In many instances, it can be used in the ”as-welded“ condition, while Type 302 must be annealed in order to retain adequate corrosion resistance. Type 304L is an extra low-carbon variation of Type 304 with a 0.03% maximum carbon content that eliminates carbide precipitation due to welding. As a result, this alloy can be used in the ”as-welded“ condition, even in severe corrosive conditions. It often eliminates the necessity of annealing weldments except for applications specifying stress relief. It has slightly lower mechanical properties than Type 304.Typical uses include architectural mouldings and trim, kitchen equipment, welded components of chemical, textile, paper, pharmaceutical and chemical industry processing equipment..

## Available Forms

All Trap Steel produces Type 304 Stainless Steel in thicknesses from 0.01" to 0.25" (0.025 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

## Specifications

All Trap Steel produces Type 304 Stainless Steel in thicknesses from 0.01" to 0.25" (0.025 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

| Type 304 | Type 304L |
|---|---|
| AMS 5513 | AMS 5511 |
| ASTM A 240 | ASTM A 240 |
| ASTM A 666 | ASTM A 666 |

## Composition

| | Type 304 % | Type 304L % |
|---|---|---|
| Carbon | 0.08Max. | 0.03Max. |
| Manganese | 2.00 Max. | 2.00 Max. |
| Phosphorus | 0.045 Max. | 0.045 Max. |
| Sulfur | 0.030 Max. | 0.030 Max. |
| Silicon | 0.75 Max. | 0.75 Max. |
| Chromium | 18.00 - 20.00 | 18.0 - 20.0 |
| Nickel | 8.00 - 12.00 | 8.0 - 12.0 |
| Nitrogen | 0.10 Max. | 0.10 Max. |
| Iron | Balance | Balance |

## Corrosion Resistance

These steels exhibit excellent resistance to a wide range of atmospheric, chemical, textile, petroleum and food industry exposures.

## Oxidation Resistance

The maximum temperature to which Types 304 and 304L can be exposed continuously without appreciable scaling is about 1650°F (899°C). For intermittent exposure, the maximum exposure temperature is about 1500°F (816°C).

## Mechanical Properties

Typical Room Temperature Mechanical Properties

| | UTS ksi (MPa) | 0.2%YS ksi (MPa) | Elongation % in 2” (50.8 mm) | Hardness Rockwell |
|---|---|---|---|---|
| Type 304L | 85 (586) | 35 (241) | 55 | B80 |
| Type 304 | 90 (621) | 42 (290) | 55 | B82 |

# Stainless Steel Material

## General Properties 316 Stainless Steel

AllTrapType 316 is an austenitic chromium-nickel stainless steel containing molybdenum. This addition increases general corrosion resistance, improves resistance to pitting from chloride ion solutions, and provides increased strength at elevated temperatures. Properties are similar to those of Type 304 except that this alloy is somewhat stronger at elevated temperatures. Corrosion resistance is improved, particularly against sulfuric, hydrochloric, acetic, formic and tartaric acids, acid sulfates and alkaline chlorides. Type 316L is an extra-low carbon version of Type 316 that minimizes harmful carbide precipitation due to welding. Typical uses include exhaust manifolds, furnace parts, heat exchangers, jet engine parts, pharmaceutical and photographic equipment, valve and pump trim, chemical equipment, digesters, tanks, evaporators, pulp, paper and textile processing equipment, parts exposed to marine atmospheres and tubing. Type 316L is used extensively for weldments where its immunity to carbide precipitation due to welding assures optimum corrosion resistance.

## Available Forms

All Trap Steel produces Types 316 and 316L Stainless Steels in thicknesses from 0.01" to 0.25" (0.25 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

## Specifications

All Trap Types 316 and 316L Stainless Steel sheet and strip are covered by the following specifications:

| Type 316 | Type 316L |
|---|---|
| AMS 5524 | AMS 5507 |
| ASTM A 240 | ASTM A 240 |
| ASTM A 666 | ASTM A 666 |

## Composition

| | Type 316 % | Type 316L % |
|---|---|---|
| Carbon | 0.08Max. | 0.03Max. |
| Manganese | 2.00 Max. | 2.00 Max. |
| Phosphorus | 0.045 Max. | 0.045 Max. |
| Sulfur | 0.030 Max. | 0.030 Max. |
| Silicon | 0.75 Max. | 0.75 Max. |
| Chromium | 18.00 - 20.00 | 18.0 - 20.0 |
| Nickel | 8.00 - 12.00 | 8.0 - 12.0 |
| Molybdenum | 2.00 - 3.00 | 2.00 - 3.00 |
| Nitrogen | 0.10 Max. | 0.10 Max. |
| Iron | Balance | Balance |

## Corrosion Resistance

Types 316 and 316L Stainless Steels exhibit better corrosion resistance than Type 304. They provide excellent pitting resistance and good resistance to most chemicals involved in the paper, textile and photographic industries.

## Mechanical Properties

Typical Room Temperature Mechanical Properties

| | UTS ksi (MPa) | 0.2%YS ksi (MPa) | Elongation % in 2" (50.8 mm) | Hardness Rockwell |
|---|---|---|---|---|
| Type 316 | 84 (579) | 42 (290) | 50 | B79 |
| Type 316L | 81 (558) | 42 (290) | 50 | B79 |

# Stainless Steel Material

## General Properties 430 Stainless Steel

AllTrap Steel Type 430 is one of the most widely used of the “non-hardenable” ferritic stainless steels. It combines good corrosion resistance and heat and oxidation resistance up to 1500°F (816°C) with good mechanical properties. Typical consumer product applications include automotive trim and molding, furnace combustion chambers, dishwashers, range hoods, gas burners on heating units, gutters and downspouts, steam iron bases and flatware. Industrial and commercial applications range from interior architectural applications to nitric acid plant equipment, oil refinery equipment, roofing and siding and restaurant equipment.

## Available Form

AllTrap Steel produces Type 430 Stainless Steel in coils and cut lengths in thicknesses 0.010" to 0.145" (0.25 mm to 3.68 mm) and widths up to and including48" (1219 mm).

## Composition %

| | |
|---|---|
| Carbon | 0.12 max. |
| Manganese | 1.00 max. |
| Phosphorus | 0.040 max. |
| Sulfur | 0.030 max. |
| Silicon | 1.00 max. |
| Chromium | 16.0 - 18.0 |
| Nickel | 0.50 max. |

## Physical Properties

Density, 0.28 lbs/in3
7.74 g/cm3

Electrical Resistivity, microhm-in (microhm-cm) 70°F (21°C) – 23.68 (60)

Specific Heat, BTU/lb/°F (kJ/kg•K)
32 - 212°F (0 - 100°C) – 0.11 (0.46)

Thermal Conductivity, BTU/hr/ft2/ft/°F (W/m•K)

at 212°F (100°C) – 15.1 (26.1)
at 932°F (500°C) – 15.2 (26.3)

Coefficient of Thermal Expansion, in/in/°F (µm/m•K)

32 -212°F (0 -100°C)– 5.8 x 10-6 (10.4)
32-1000°F (0 -538°C)–6.3 x 10-6 (11.4)

Modulus of Elasticity, ksi (MPa)
29 x 103 (200 x 103)

## Specifications

AllTrap Steel Type 430 Stainless Steel sheet and strip is covered by the following specifications:
AMS 5503
ASTM A 240

## Mechanical Properties

Typical Mechanical Properties

| | | Elongation | |
|---|---|---|---|
| UTS ksi (MPa) | 0.2% YS ksi (MPa) | % in 2* (50.8mm) | Hardness Rockwell |
| 70 (483) | 45 (310) | 25 | B85 |

## Heat Treatments

Anneal: Heat to 1400 - 1525°F (760 - 829°C), air cool or water quench.

## Corrosion and Oxidation Resistance

AllTrap Steel Type 430 has excellent corrosion resistance, including high resistance to nitric acid as well as to sulfur gases and many organic and food acids. This alloy does not provide the resistance to pitting by dilute reducing acids that is provided by the chromium-nickel stainless steels. Because of its relatively high chromium content, the material provides good resistance to oxidation. Its maximum scaling temperature is 1500°F (816°C) for continuous service.

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