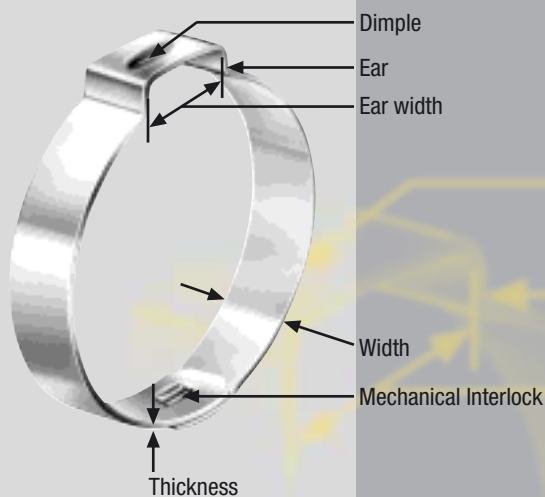


OETIKER

Technical Data Sheet

1-Ear Clamps with Mechanical Interlock

Product Group **105 & 155**



Dimple

Ear

Ear width

Width

Mechanical Interlock

Thickness



Connecting Technology

Technical Data

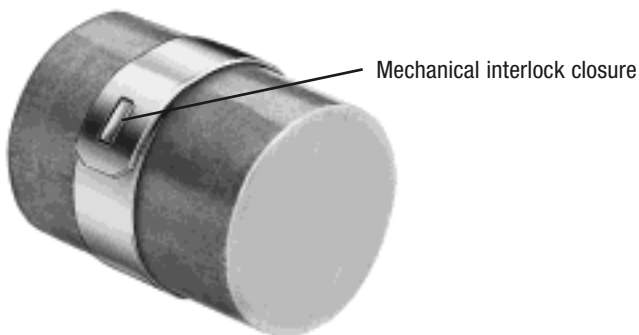
1-Ear Clamps with Mechanical Interlock

Product Group **105 & 155**



Economical, quality clamp for low-pressure applications. Developed for a variety of applications in automotive systems, general industry and fluid distribution systems that incorporate plastic transition fittings and tubes.

With this design of clamp, the mechanical interlock practically eliminates the potential for localized corrosion, a potential failure mechanism at the heat-affected zone of a welded connection.



Material

- **105** Galvanized or zinc-plated steelband
- **155** Stainless Steel, Material no. 1.4301 / UNS S30400

Size range *Width x thickness*
10.5 - 116.0 mm 7.0 x 0.6 / 0.75 mm

Size

See pages 3/4.

Installation

See page 6.

The information provided in this data sheet is intended for reference purposes only and should not be considered a specification. OETIKER invites customers to submit samples with relevant application information, to determine the best suited clamp product and installation method.

Features

- Narrow band, only 7 mm wide
- Lightweight
- Smooth edged band steel prevents damage to mating component
- Fast, simple, secure installation
- Mechanical Interlock permits use of precoated material
- Deformation of the ear provides visual indication of closure

Installation tools

OETIKER supplies pincers for manual closure.



OETIKER recommends pneumatic pincers with electronic gauging, to ensure repeatable assembly and uniform closure, particularly for mass production applications.



The innovative "Electronically Controlled Pneumatic Power Tool OETIKER ELK 01" guarantees reliable installation with electronic monitoring of all necessary parameters. It practically eliminates the possibility of any unnoticed defective closures.



For further information, please see the OETIKER Tool Catalogue.

Technical Data

1-Ear Clamps with Mechanical Interlock

Product Group **105**

| Item No. | Ref. No. | Size range (mm) | Item No. | Ref. No. | Size range (mm) |
|--|----------|-----------------|--|----------|-----------------|
| 1-Ear Clamp with Mechanical Interlock, GALFAN | | | 1-Ear Clamp with Mechanical Interlock, GALFAN | | |
| 10500001 | 0113.3 | 9.7 - 11.3 | 10500054 | 0830.3 | 79.9 - 83 |
| 10500002 | 0123.3 | 10.4 - 12.3 | 10500055 | 0845.3 | 81.4 - 84.5 |
| 10500003 | 0133.3 | 11.4 - 13.3 | 10500056 | 0860.3 | 82.9 - 86 |
| 10500004 | 0135.3 | 11.5 - 13.5 | 10500057 | 0875.3 | 84.4 - 87.5 |
| 10500005 | 0138.3 | 11.9 - 13.8 | 10500058 | 0890.3 | 85.9 - 89 |
| 10500006 | 0140.3 | 11.9 - 14 | 10500059 | 0905.3 | 87.4 - 90.5 |
| 10500007 | 0145.3 | 12.6 - 14.5 | 10500060 | 0920.3 | 88.9 - 92 |
| 10500008 | 0157.3 | 13.5 - 15.7 | 10500061 | 0935.3 | 90.4 - 93.5 |
| 10500009 | 0170.3 | 15.1 - 17 | 10500062 | 0950.3 | 91.9 - 95 |
| 10500010 | 0185.3 | 15.7 - 18.5 | 10500063 | 0965.3 | 93.4 - 96.5 |
| 10500011 | 0198.3 | 17 - 19.8 | 10500064 | 0980.3 | 94.9 - 98 |
| 10500012 | 0210.3 | 18.2 - 21 | 10500065 | 0995.3 | 96.4 - 99.5 |
| 10500013 | 0226.3 | 19.8 - 22.6 | 10500066 | 1010.3 | 97.9 - 101 |
| 10500014 | 0241.3 | 21.3 - 24.1 | 10500067 | 1025.3 | 99.4 - 102.5 |
| 10500015 | 0256.3 | 22.8 - 25.6 | 10500159 | 1040.3 | 100.9 - 104 |
| 10500016 | 0271.3 | 24 - 27.1 | 10500068 | 1055.3 | 102.4 - 105.5 |
| 10500017 | 0286.3 | 25.5 - 28.6 | 10500142 | 1070.3 | 103.9 - 107 |
| 10500018 | 0301.3 | 27 - 30.1 | 10500164 | 1085.3 | 105.9 - 109 |
| 10500019 | 0316.3 | 28.5 - 31.6 | 10500165 | 1100.3 | 106.9 - 110 |
| 10500020 | 0331.3 | 30 - 33.1 | 10500166 | 1115.3 | 108.4 - 111.5 |
| 10500021 | 0346.3 | 31.5 - 34.6 | 10500167 | 1130.3 | 109.9 - 113 |
| 10500022 | 0361.3 | 33 - 36.1 | 10500168 | 1145.3 | 111.4 - 114.5 |
| 10500023 | 0376.3 | 34.5 - 37.6 | 10500069 | 1160.3 | 112.9 - 116 |
| 10500024 | 0381.3 | 35 - 38.1 | | | |
| 10500025 | 0396.3 | 36.5 - 39.6 | | | |
| 10500026 | 0410.3 | 37.9 - 41 | | | |
| 10500027 | 0425.3 | 39.4 - 42.5 | | | |
| 10500028 | 0440.3 | 40.9 - 44 | | | |
| 10500029 | 0455.3 | 42.4 - 45.5 | | | |
| 10500030 | 0470.3 | 43.9 - 47 | | | |
| 10500031 | 0485.3 | 45.4 - 48.5 | | | |
| 10500032 | 0500.3 | 46.9 - 50 | | | |
| 10500033 | 0515.3 | 48.4 - 51.5 | | | |
| 10500034 | 0530.3 | 49.9 - 53 | | | |
| 10500035 | 0545.3 | 51.4 - 54.5 | | | |
| 10500036 | 0560.3 | 52.9 - 56 | | | |
| 10500037 | 0575.3 | 54.4 - 57.5 | | | |
| 10500038 | 0590.3 | 55.9 - 59 | | | |
| 10500039 | 0605.3 | 57.4 - 60.5 | | | |
| 10500040 | 0620.3 | 58.9 - 62 | | | |
| 10500041 | 0635.3 | 60.4 - 63.5 | | | |
| 10500042 | 0650.3 | 61.9 - 65 | | | |
| 10500043 | 0665.3 | 63.4 - 66.5 | | | |
| 10500044 | 0680.3 | 64.9 - 68 | | | |
| 10500045 | 0695.3 | 66.4 - 69.5 | | | |
| 10500046 | 0710.3 | 67.9 - 71 | | | |
| 10500047 | 0725.3 | 69.4 - 72.5 | | | |
| 10500048 | 0740.3 | 70.9 - 74 | | | |
| 10500049 | 0755.3 | 72.4 - 75.5 | | | |
| 10500050 | 0770.3 | 73.9 - 77 | | | |
| 10500051 | 0785.3 | 75.4 - 78.5 | | | |
| 10500052 | 0800.3 | 76.9 - 80 | | | |
| 10500053 | 0815.3 | 78.4 - 81.5 | | | |

Technical Data

1-Ear Clamps with Mechanical Interlock

Product Group **155**



| Item No. | Ref. No. | Size range (mm) |
|---|----------|-----------------|
| 1-Ear Clamp with Mechanical Interlock, stainless | | |

| | | |
|----------|---------|-------------|
| 15500000 | 0105.0R | 8.9 - 10.5 |
| 15500001 | 0113.0R | 9.7 - 11.3 |
| 15500002 | 0123.0R | 10.4 - 12.3 |
| 15500003 | 0133.0R | 11.4 - 13.3 |
| 15500004 | 0135.0R | 11.5 - 13.5 |
| 15500005 | 0138.0R | 11.9 - 13.8 |
| 15500006 | 0140.0R | 11.9 - 14 |
| 15500007 | 0145.0R | 12.6 - 14.5 |
| 15500008 | 0157.0R | 13.5 - 15.7 |
| 15500009 | 0170.0R | 15.1 - 17 |
| 15500010 | 0185.0R | 15 - 18.5 |
| 15500011 | 0198.0R | 17 - 19.8 |
| 15500012 | 0210.0R | 18.2 - 21 |
| 15500013 | 0226.0R | 19.8 - 22.6 |
| 15500014 | 0241.0R | 21.3 - 24.1 |
| 15500015 | 0256.0R | 22.8 - 25.6 |
| 15500016 | 0271.0R | 24 - 27.1 |
| 15500017 | 0286.0R | 25.5 - 28.6 |
| 15500018 | 0301.0R | 27 - 30.1 |
| 15500019 | 0316.0R | 28.5 - 31.6 |
| 15500020 | 0331.0R | 30 - 33.1 |
| 15500021 | 0346.0R | 31.5 - 34.6 |
| 15500022 | 0361.0R | 33 - 36.1 |
| 15500023 | 0376.0R | 34.5 - 37.6 |
| 15500024 | 0381.0R | 35 - 38.1 |
| 15500025 | 0396.0R | 36.5 - 39.6 |
| 15500026 | 0410.0R | 37.9 - 41 |
| 15500027 | 0425.0R | 39.4 - 42.5 |
| 15500028 | 0440.0R | 40.9 - 44 |
| 15500029 | 0455.0R | 42.4 - 45.5 |
| 15500030 | 0470.0R | 43.9 - 47 |
| 15500031 | 0485.0R | 45.4 - 48.5 |
| 15500032 | 0500.0R | 46.9 - 50 |
| 15500033 | 0515.0R | 48.4 - 51.5 |
| 15500034 | 0530.0R | 49.9 - 53 |
| 15500035 | 0545.0R | 51.4 - 54.5 |
| 15500036 | 0560.0R | 52.9 - 56 |
| 15500037 | 0575.0R | 54.4 - 57.5 |
| 15500038 | 0590.0R | 55.9 - 59 |
| 15500039 | 0605.0R | 57.4 - 60.5 |
| 15500040 | 0620.0R | 58.9 - 62 |
| 15500041 | 0635.0R | 60.4 - 63.5 |
| 15500042 | 0650.0R | 61.9 - 65 |
| 15500043 | 0665.0R | 63.4 - 66.5 |
| 15500044 | 0680.0R | 64.9 - 68 |
| 15500045 | 0695.0R | 66.4 - 69.5 |
| 15500046 | 0710.0R | 67.9 - 71 |
| 15500047 | 0725.0R | 69.4 - 72.5 |
| 15500048 | 0740.0R | 70.9 - 74 |
| 15500049 | 0755.0R | 72.4 - 75.5 |
| 15500050 | 0770.0R | 73.9 - 77 |
| 15500051 | 0785.0R | 75.4 - 78.5 |
| 15500052 | 0800.0R | 76.9 - 80 |

| Item No. | Ref. No. | Size range (mm) |
|---|----------|-----------------|
| 1-Ear Clamp with Mechanical Interlock, stainless | | |

| | | |
|----------|---------|---------------|
| 15500053 | 0815.0R | 78.4 - 81.5 |
| 15500054 | 0830.0R | 79.9 - 83 |
| 15500055 | 0845.0R | 81.4 - 84.5 |
| 15500056 | 0860.0R | 82.9 - 86 |
| 15500057 | 0875.0R | 84.4 - 87.5 |
| 15500058 | 0890.0R | 85.9 - 89 |
| 15500059 | 0905.0R | 87.4 - 90.5 |
| 15500060 | 0920.0R | 88.9 - 92 |
| 15500061 | 0935.0R | 90.4 - 93.5 |
| 15500062 | 0950.0R | 91.9 - 95 |
| 15500063 | 0965.0R | 93.4 - 96.5 |
| 15500064 | 0980.0R | 94.9 - 98 |
| 15500065 | 0995.0R | 96.4 - 99.5 |
| 15500066 | 1010.0R | 97.9 - 101 |
| 15500067 | 1025.0R | 99.4 - 102.5 |
| 15500101 | 1040.0R | 100.9 - 104 |
| 15500068 | 1055.0R | 102.4 - 105.5 |
| 15500102 | 1070.0R | 103.9 - 107 |
| 15500103 | 1085.0R | 105.4 - 108.5 |
| 15500104 | 1100.0R | 106.9 - 110 |
| 15500105 | 1115.0R | 108.4 - 111.5 |
| 15500106 | 1130.0R | 109.9 - 113 |
| 15500107 | 1145.0R | 111.4 - 114.5 |
| 15500069 | 1160.0R | 112.9 - 116 |

Technical Data

1-Ear Clamps with Mechanical Interlock

Product Group **105 & 155**



1.0 Material

OETIKER 1-Ear Clamps with the Mechanical Locking design are made, in the standard version, from SAE 1008/1010 – DIN 1.0338 with a GALFAN corrosion protection coating to EN 10214, or from an austenitic stainless steel. The latter material is designated DIN 1.4301 / UNS S30400, an 18% chromium, 8% nickel alloy.

This alloy acquires additional strength through cold working, during strip processing and clamp manufacture. The chemical composition and mechanical properties provide the exceptional combination of toughness and ductility, which are a prerequisite for the clamp closure process.

Edge condition

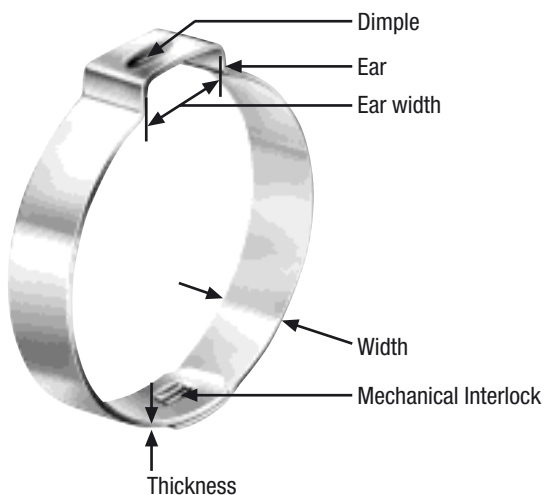
Stringent controls are maintained at the OETIKER strip processing facility, conditioning the slit material and forming a machined or rolled edge radius. This process reduces the potential for damage caused by sharp or square edges, when the clamp compresses adjacent material.

Corrosion-resistance

Carbon steel clamps coated with the GALFAN process provide a level of corrosion resistance expected by general industry standards. This coating ensures that the clamps will withstand a minimum of 144 hours neutral salt-spray when tested in accordance with DIN 50012 / ASTM B117, without base-metal corrosion.

The chemical composition of DIN 1.4301 / UNS S30400 is practically immune to the neutral salt-spray procedure and has excellent resistance to many alternative corrosive environments.

2.0 Clamp Design



1-Ear Clamps with the mechanical interlock closure are made in one standard width and two alternative gauge thickness, a factor of the grade of material selected. The dimensions and material grade should be selected taking into account the required radial force, the nature of the hose, and the need to maintain sealing and/or retaining properties under the applicable environmental conditions.

Ear Design

The integrated dimple in the ear effectively increases the retained radial force and provides a spring effect when the diameter or the application expands or contracts due to thermal or mechanical influences (i.e. vibration).

Closure

Using tools designed or endorsed by OETIKER, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportionate to the open “ear” width. The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{ear width (s)}}{\pi}$$

To ensure perfect sealing, clamp ears must be correctly closed during installation.

Clamp diameter

As a guide, the clamp nominal diameter should be selected so that the outside diameter of the hose, after it has been pushed on to the component to which it is to be fastened (e.g. a hose nipple), is approximately in the middle of the diameter range of the chosen clamp.

Mechanical Interlock closure

The joining of the band material is a mechanical interlocking design, its purpose is to maintain the integrity of the interrupted strip and maintain the round geometry. The interlock is designed to withstand the recommended clamp “closing force” for the appropriate material grade and the anticipated resistance from typical applications. The “resistance load” is closely related to the “closing force”, which is discussed in Section 3.0. Use of a mechanically jointed band connecting system, as opposed to a spot welding practice, eliminates the potential of induced high temperature corrosion.

Technical Data

1-Ear Clamps with Mechanical Interlock

Product Group **105 & 155**

3.0 Assembly Recommendations

The clamp ear should be closed with a constant tool jaw force, this practice is referred to as “force priority closure”. The assembly method assures that a uniform and repeatable stress is applied to the application in addition to a constant tensile force on the mechanical interlock. Employing this methodology when closing the 105 & 155 series clamp will compensate for any component tolerance variations, assuring that the clamp applies a constant radial force on the application. Fluctuations in component tolerances are absorbed by the changing inner “ear” gap (the space between the lower radii after installation). Clamp installation monitoring equipment and process data collection is available by incorporating the “Electronically Controlled Assembly Tool” OETIKER ELK01 within the assembly process.

Closing force

The closing force is a factor established by the preferred material compression or surface pressure and should be qualified through dimensional evaluations and experimentation. The resistance against the clamp should equal that of the applied force, therefore, when compressing malleable materials the closing force is reduced to the lower range of the recommendation. The table below shows the average applied closing forces for different clamp-material dimensions.

Average applied closing forces

| Material- dimensions | Closing force (N) GALFAN / Stainless | Manual closure tool* | Recommended pneumatic pincer** |
|-------------------------|---|-------------------------|-----------------------------------|
| 10.5 - 17.0 | 1200 | 14100082 | HO 2000 |
| | or | 14100083 | |
| 18.5 -116.0 | 2000 | 14100082 | HO 2000 |
| | or | 14100083 | |

* 14100082 Manual pincer – standard, 14100083 Manual pincer with side cutter.

** With appropriate closing-force setting!



Important note

These figures are only intended as a guide, they may vary depending on type and tolerances of the products being clamped. To ensure the best clamp selection we recommend making functional tests with several assemblies.

The addresses of all OETIKER companies and agencies are included on our website.

www.oetiker.com

OETIKER[®]
Connecting Technology

OETIKER has been developing connecting technology for over 60 years. OETIKER products are manufactured by its own companies in line with ISO/TS 16949 and sold worldwide in over 40 countries. Numerous patents are proof of continuous innovation.

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