# NORMACLAMP® – Hose Clamps

## NORMACLAMP® FBS –
## Springband hose clips to DIN 3021

Because of their design, NORMACLAMP® FBS springband hose clips are particularly suitable for use with hose-spigot connections which are submitted to extreme temperature changes.

Once assembled NORMACLAMP® FBS provide a continuously readjusting dynamic tightening effect.

Also at low temperatures the radially acting tightening force is sufficient to assure a reliable tightness of the system. Even hoses that are submitted to extreme temperature cycles, or those with a tendency to "creep" can be combined to form a safe connection when NORMACLAMP® FBS are used.

## Short description of technical features

**1** Lot number stamped on clamp band = safe retraceability

**2** NORMA® Logo = the visible sign for high quality

**3** Organic/inorganic coating
= optimal protection against corrosion
Coating in different colour
= improved engine design

**4** Nominal diameter stamped on the clamp
= prevention of mistakes

**5** Special design = uniform distribution of clamping forces and optimal roundness
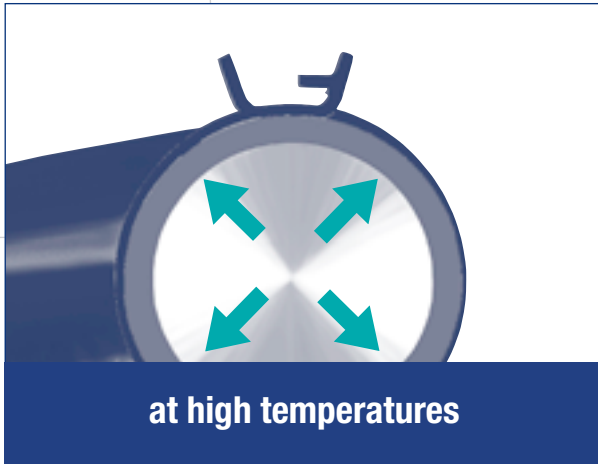
**6** Round band edges
= optimal hose protection

## Materialien

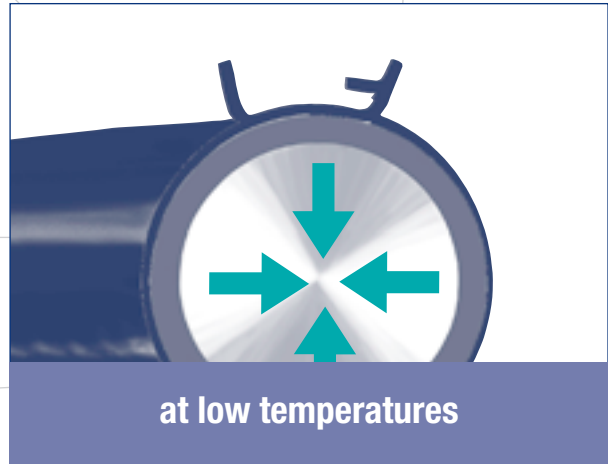| C 75 S | Zinc-Aluminium Coating | Organic Coating |
|--------|------------------------|-----------------|
| X | Basecoat | Topcoat |

# NORMA**CLAMP**® – Hose Clamps

## Short Description

- Dynamic hose clip
- Band material C 75 S
- Coating contains zinc – chromium VI-free
- Nominal diameter from 13 up to 80 mm – different gradations



**at high temperatures**

- Expanding hose diameter
- FBS adapting to the hose



**at low temperatures**

- Reduced hose diameter
- FBS is re-tightening
- Consistent clamping force ensuring the perfect tightness of the joint

## Technical characteristics

### Corrosion resistance

| Material | Corrosion resistance in salt spray testing |
|----------|-------------------------------------------|
| C 75 S   | from 480 h                                |

## The advantages at a glance

- Single-part hose clips without screw
- Uniform distribution of clamping forces
- Optimal roundness
- Temperature resistance from – 40 °C up to 200 °C
- Unmistakable tracing due to lot numbering
- Visual control of nominal diameters by colour codes
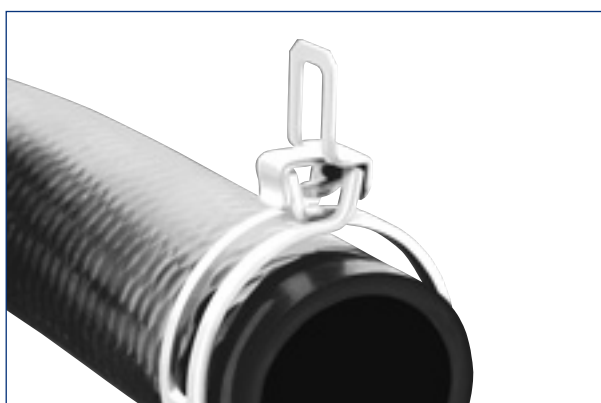
# NORMACLAMP® – Hose Clamps

## Variants

### NORMACLAMP® FBS R

is a space-saving clamp. It was designed with the aim of realising the technical minimum overall height to allow its use in difficult assembly situations.
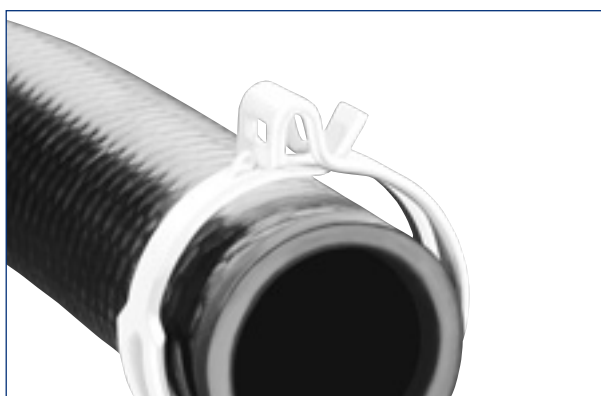
### NORMACLAMP® FBS HC

is a pre-opened version secured by a plastic retaining clip. After slipping the clamp onto the hose, this clip can be easily removed by hand.

### NORMACLAMP® FBS MC

is a pre-opened (and, if desired, pre-positioned) clamp secured by a small metal clip. The retaining clip for this version is removed by using pliers.

### NORMACLAMP® FBS C

is a pre-opened clamp which is pre-positioned on the hose. The retaining mechanism for this version is an integral part of the clamp band.

# NORMA**CLAMP**® – Hose Clamps

## NORMA®-Professional tooling

### Hand-held pliers

For professional assembly operations we offer you a range of quality hand-held and pneumatic tools:



**FBS hand-held pliers Type 1**

Suitable for small diameters.



**FBS hand-held pliers Type 2**

Suitable for all nominal diameters.
The integrated safety lever fixes the position of the pliers.

### Pneumatic tools



**FBS pneumatic pliers Type "S"**

Suitable for the assembly of FBS that are pre-positioned on the hose.



**FBS pneumatic pliers Type "W"**

Suitable for volume production.
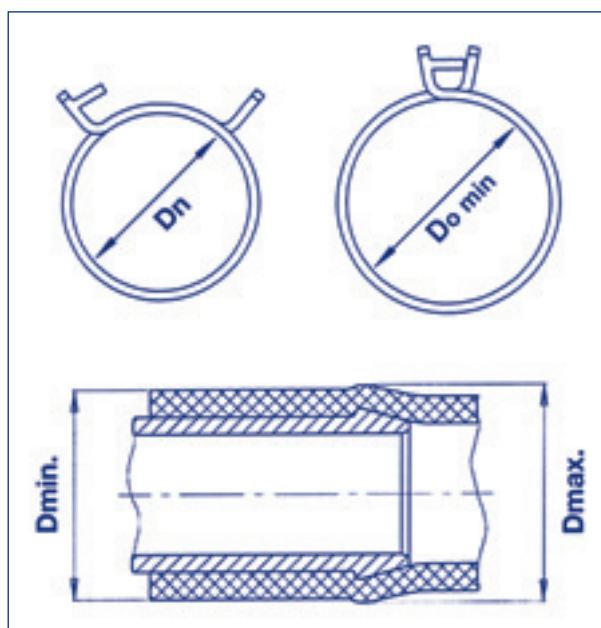The clamp head is approached sideways.

# NORMA**CLAMP**® – Hose Clamps

## Applications

NORMACLAMP® FBS springband clips are specially suitable for use in applications where connections are under extreme cyclic temperature loads:

- Coolant and heating systems
- Fuel lines
- Airducts
- Drainage of water and brine

In order to determine the correct size of clamp please proceed as follows:

1. Slide the hose onto the spigot and measure the $D_{min.}$ and $D_{max.}$. (see diagram below)

2. From the $D_{min.}$ value determine the nominal diameter ($D_n$) of the appropriate clamp.

$$D_n = D_{min.}$$

3. Compare the $D_{max.}$ value with the stated minimum diameter of the open clamp and select the suitable clamp size.

$$D_{0\ min} \geq D_{max.}$$



Samples can be provided on request. We shall be pleased to discuss your specific problem or application in detail. Just contact us.

# NORMA**CLAMP®** – Hose Clamps

## Survey of sizes, band widths & materials
NORMA**CLAMP® FBS**

| Band width (mm) | Description | $D_n$ in mm | $D_{0\ min}$ in mm | Packaging (industrial carton) | C 75 S |
|---|---|---|---|---|---|
| 12 | FBS 13/12 | 13 | 14.5 | 3000 | X |
| 12 | FBS 14/12 | 14 | 15.8 | 3000 | X |
| 12 | FBS 15/12 | 15 | 16.8 | 3000 | X |
| 12 | FBS 16/12 | 16 | 17.5 | 1000 | X |
| 12 | FBS 17/12 | 17 | 18.5 | 3000 | X |
| 12 | FBS 18/12 | 18 | 19.0 | 2500 | X |
| 12 | FBS 19/12 | 19 | 21.0 | 2000 | X |
| 12 | FBS 20/12 | 20 | 21.6 | 2000 | X |
| 12 | FBS 21/12 | 21 | 22.5 | 1500 | X |
| 12 | FBS 22/12 | 22 | 24.5 | 1500 | X |
| 12 | FBS 23/12 | 23 | 24.7 | 1500 | X |
| 12 | FBS 24/12 | 24 | 26.0 | 1000 | X |
| 12 | FBS 25/12 | 25 | 27.0 | 1000 | X |
| 12 | FBS 26/12 | 26 | 28.0 | 1000 | X |
| 12 | FBS 27/12 | 27 | 29.0 | 1000 | X |
| 12 | FBS 28/12 | 28 | 30.5 | 1000 | X |
| 12 | FBS 29/12 | 29 | 31.5 | 1000 | X |
| 12 | FBS 30/12 | 30 | 32.5 | 1000 | X |
| 12 | FBS 32/12 | 32 | 34.5 | 1000 | X |
| 12 | FBS 35/12 | 35 | 38.0 | 1000 | X |
| 12 | FBS 36/12 | 36 | 39.0 | 1000 | X |
| 12 | FBS 38/12 | 38 | 41.5 | 1000 | X |
| 12 | FBS 40/12 | 40 | 42.5 | 500 | X |
| 12 | FBS 42/12 | 42 | 44.5 | 500 | X |
| 12 | FBS 44/12 | 44 | 46.5 | 500 | X |
| 12 | FBS 46/12 | 46 | 49.0 | 500 | X |
| 12 | FBS 47/12 | 47 | 50.0 | 500 | X |
| 12 | FBS 50/12 | 50 | 53.0 | 500 | X |
| 12 | FBS 51/12 | 51 | 54.0 | 500 | X |
| 12 | FBS 53/12 | 53 | 56.0 | 500 | X |
| 12 | FBS 55/12 | 55 | 58.0 | 500 | X |
| 12 | FBS 60/12 | 60 | 63.0 | 150 | X |
| 12 | FBS 65/12 | 65 | 68.0 | 500 | X |
| 12 | FBS 70/12 | 70 | 73.0 | 500 | X |
| 12 | FBS 75/12 | 75 | 78.0 | 500 | X |
| 12 | FBS 80/12 | 80 | 83.0 | 250 | X |

**Enquiries/ordering:**

When making enquiries or placing orders please indicate as follows:

| | 1. Typ | 2. Nominal diameter | 3. Band width |
|---|---|---|---|
| Example | FBS | 13/ | 12 |