SMARTFLEX TANK SUMPS: DIRECTIONS FOR A PROPER INSTALLATION

1 INTRODUCTION AND GENERAL INFORMATION
Smartflex tank sumps, along with pipes, fittings and accessories, form a complete System for the secondary containment. This section contains information about tank sumps and the operating procedures to ensure their correct installation.

It is important to read these instructions before starting the installation.

2 APPLICATIONS
Smartflex System provides four tank sumps models all available also in as 2-piece electrofusion models. They are:
• STS5238
• STS5238N
• STS5238LR
• STS4536

Smartflex tank sumps must be placed in the space between the containment skirt’s upper side and tank frame. Sumps are very important elements of the system, their function being that of a two-way liquid isolation chamber, thus preventing:

• the entering of ground water and any other external liquid;
• the leakage of any contained product from the tank into the environment.

All Smartflex sumps are made of HDPE which makes them chemically and structurally suitable for buried applications and crack / break resistant to underground loads.
3 TRANSPORT

When loading the sumps onto a vehicle bed, make sure the latter is perfectly even. Sumps must not protrude excessively from the surface on which they are loaded.

Use cables, ropes or similar equipment to harness the load: take any necessary step to prevent sump damage. If sumps are loaded/unloaded or manoeuvred with cranes or an excavator, the sumps must be picked up at their center with the help of a spreader bar of adequate width.

Whenever these operations are undertaken manually, ensure that the sumps do not scrape along the edge of the vehicle bed or against any other hard, sharp object. The electrofusion 2-piece tank sumps offer the advantage of easier transport and handling and optimize the truck/container load.

3.1 LOADING QUANTITY

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty in 20ft</th>
<th>Qty in 40ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>19STS5238N</td>
<td>7pcs.</td>
<td>14pcs.</td>
</tr>
<tr>
<td>19STS5238LR</td>
<td>7pcs.</td>
<td>14pcs.</td>
</tr>
<tr>
<td>19S22TS5238N</td>
<td>16pcs.</td>
<td>32pcs.</td>
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<tr>
<td>19S22TS5238LR</td>
<td>8pcs.</td>
<td>16pcs.</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
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</thead>
<tbody>
<tr>
<td>19STS5238N</td>
<td>17pcs.</td>
</tr>
<tr>
<td>19STS5238LR</td>
<td>17pcs.</td>
</tr>
<tr>
<td>19S22TS5238N</td>
<td>40pcs.</td>
</tr>
<tr>
<td>19S22TS5238LR</td>
<td>20pcs.</td>
</tr>
</tbody>
</table>

Note: The above quantities are indicative and may change due to the truck volume and sumps packaging.
4 INSTALLATION STEPS

These are the most important steps:

a) Mount the sump on the containment skirt
b) Install entry boots
c) Install pump (when required) and fittings
d) Install the sump cover
e) Install the manhole cover at ground level

Normally, the containment skirt, situated on the tank’s upper surface, is folded to create an inwards shelf large enough to allow assembly by bolts.

1. Having particular care to align the sump centrally over the containment skirt, using a ruler and a grease pencil, mark the sump’s base.

2. Cut along the line.

3. Align the sump centrally over the containment skirt and make at least 8 holes on every side.

4. Bolt the sump base on the containment skirt.

Fit a gasket between the sump and the containment skirt in order to ensure that the assembly is watertight. The gasket is not included in the sump (except for KT one).

Put a rim of polyurethane mastic running around the holes both above and below the gasket (see figure below).

Insert some metallic spacers along the skirt’s perimeter (normally 4 are used) to achieve a better pressure distribution over the gasket. Tighten the bolts in a “cross-way” for a better distribution of the screwing strength. Due to the many possible tank/sump assembly configurations and environmental situations, it is advisable to purchase gaskets and spacers according to specific needs.

At this point you can install entry boots, pipes and fittings.

Before welding the entry boots proceed with the pressure test of the piping.
Scrape the surface to be welded with the manual scraper (Model RAM1 or RAM2), then clean all the components involved in the welding process with a clean cloth soaked with a recommended cleaning solvent (Model LID1).

**Note:** The following pure solvents may be used, Acetone, Isopropyl Alcohol, Trichloroethane and Dichloromethane. The use of other primers or solvents is not allowed.

_Scrape the surface to be welded with the manual scraper (Model RAM1 or RAM2), then clean all the components involved in the welding process with a clean cloth soaked with a recommended cleaning solvent (Model LID1)._

**Note:** When scraping, a perfectly even surface is required, please take care to remove any roughness that could cause the weld to be unsuccessful.

Position the upper section of the sump on its base. Please take care not to damage the connectors necessary for the welding process and correctly align the arrows shown on both components.

**Note:** When scraping, a perfectly even surface is required, please take care to remove any roughness that could cause the weld to be unsuccessful.

Position the upper section of the sump on its base. Please take care not to damage the connectors necessary for the welding process and correctly align the arrows shown on both components.
Weld the sump using the specific bar code supplied with every sump, following the instructions shown on the welding machine’s display.

Secure the two components together using 12 clamps (8 positioned on the corners and 4 centred on the long sides).

Note: If possible, try to attain a constant gap between the clamp and the sump’s edge. Use blocks under the clamps to distribute the pressure load, this will further assist the welding process.
Wait until the cooling down time shown on the bar code of the sump to elapse, then remove the clamps.

Before positioning the lid on the riser (upper) section of the sump, ensure that the gasket/seal is correctly positioned on the risers lip and is not damaged in any way. This is necessary to obtain an effective seal.

Affix the provided handles to complete the installation.

New version of STS5238 (N) and STS5238LR offers a new lid shape with a threaded centre cap and a new fixing apparatus available upon request.

Proceed by mounting the 6 clamps on the lid using the 6 screws supplied (if purchased).

Note: If required, you can trim the riser (upper) section of the sump to the required height. The cut surfaces must be flat and without any sharp or rough edges.
To perform a vacuum test on the lid it is necessary to follow these steps:

1. Remove the handle.

2. Drill a 6 mm hole through the base of the handle assembly point on the lid.

3. Screw the quick fit connector (Model SVT6) properly sealed with thread sealant into the handle thread.

4. Connect the specific test tube for the test (Model STT6).

5. Connect the ejector (Model SVE) to the compressor line to generate a vacuum to commence the vacuum test.

6. Connect the test line to the vacuum test unit (Model SVTU) following the specific instructions.

The vacuum test shall be performed at -0.05 bar for 30 minutes.

Note: Once the test is complete it is recommended to replace the handle on the lid, sealing the thread with a thread sealant.
# RECOMMENDED TOOLS AND EQUIPMENT NECESSARY FOR THE ASSEMBLY

<table>
<thead>
<tr>
<th></th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cleaning solvent or primer</td>
</tr>
<tr>
<td>2</td>
<td>Soft cloth</td>
</tr>
<tr>
<td>3</td>
<td>12 pliers (Model SPINZ)</td>
</tr>
<tr>
<td>4</td>
<td>Saw (option)</td>
</tr>
<tr>
<td>5</td>
<td>Welding unit (Model SSEL)</td>
</tr>
<tr>
<td>6</td>
<td>Drill with 10 mm tip</td>
</tr>
<tr>
<td>7</td>
<td>Ø 6 Rilsan test tube (Model STT6)</td>
</tr>
<tr>
<td>8</td>
<td>Thread sealant (Model SF)</td>
</tr>
<tr>
<td>9</td>
<td>Ejector (Model SVE)</td>
</tr>
<tr>
<td>10</td>
<td>Vacuum test unit (Model SVTU)</td>
</tr>
</tbody>
</table>
All dimensions have to be considered in millimeters with 5% tolerance if not otherwise mentioned.

**Parts List**

<table>
<thead>
<tr>
<th>Pos</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sump Base</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Powercore</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Connector pin</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Connector support</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Sump Riser</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Gasket - 19SGU4536/5238 - spare part</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Sump Lid</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Handle - 19MAPO14</td>
<td>2</td>
</tr>
</tbody>
</table>
ELECTROFUSION 2-PIECE TANK SUMP (HDPE) - LONG RISER
POZZETTO ELETTROSALDABILE IN DUE PARTI PER PASSO D'UOMO - ALTO

<table>
<thead>
<tr>
<th>CODE</th>
<th>D</th>
<th>L</th>
<th>H</th>
<th>H1</th>
<th>H2</th>
</tr>
</thead>
<tbody>
<tr>
<td>19S22TS5238LR</td>
<td>987</td>
<td>1330</td>
<td>1750</td>
<td>520</td>
<td>1210</td>
</tr>
</tbody>
</table>

All dimensions have to be considered in millimeters with 5% tolerance if not otherwise mentioned.

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PARTS LIST

<table>
<thead>
<tr>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handle - 19MAPO14</td>
<td>2</td>
</tr>
<tr>
<td>Top cap - 19STFG - accessory</td>
<td>1</td>
</tr>
<tr>
<td>Mounting lid kit - 19SKF - accessory</td>
<td>1</td>
</tr>
<tr>
<td>Sump Lid 5238</td>
<td>1</td>
</tr>
<tr>
<td>Gasket - 19SGU5238</td>
<td>1</td>
</tr>
<tr>
<td>Sump Riser</td>
<td>1</td>
</tr>
<tr>
<td>Connector support</td>
<td>2</td>
</tr>
<tr>
<td>Connector pin</td>
<td>2</td>
</tr>
<tr>
<td>Powercore</td>
<td>2</td>
</tr>
<tr>
<td>Sump Base</td>
<td>1</td>
</tr>
</tbody>
</table>

All dimensions have to be considered in millimeters with 5% tolerance if not otherwise mentioned.

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6 BACKFILLING

After the sump installation, it is necessary to backfill the area that surrounds the sump. This operation, frequently carried out without particular attention, is one of the fundamental steps to obtain a correct positioning of the backfilling material that supports the sump. Backfilling material must be round and evenly shaped as sharp object would puncture the sump thus initiating cracks. It is standardized by a number of different standards such as CEN TR1046 (2013).

In any case, the material laid around the sump must be compacted to prevent ground shifts which could eventually damage the sump and affect the system stability. Particular care should be taken when filling the area between the sump base and the tank upper surface.

According to mechanical strength evaluations for the installation of SMARTFLEX sumps, here are Nupigeco's specifications:

- **Gs 2 Soil:** well graded gravels, gravel-sand mixtures, poorly graded gravel-sand mixtures, coarse grained granular soil predominantly sand sized, such as single sized sands, in particular:
  - **Pea gravel with size diameter between 8-25 mm (1/3”-1”)**
- **Gs 3 Soil:** mixed grained soils such silty gravel-sand mixtures, silty sands, clayey sands, in particular:
  - **Coarse grained sand with low fine fraction**

In this case, when backfilling, make sure that the material is uniformly distributed and packed around the tank sumps. All sand backfilling material shall be clean and free to flow.

**Attention:** All backfilling materials must be dry and free from snow, ice and debris. The use of different materials from those specified may cause serious damage and/or affect the performance of the Smartflex sump and the warranty.
7  STAM INSTALLATION GUIDELINES

Specification of materials and installation guide EN124: 1994 Petrol for vehicle category and category C250 composite covers for access on service stations

1. Lip (if used): concrete around the frame should be a minimum of 200mm circumference around the frame and a minimum* strength rating of 32Mpa*. The lip surface must be level with the top edge of the frame. This is to ensure that the manhole frame has no undue stress from vehicles and allows for a suitable level area for the lifting tool to work correctly.

2. Asphalt/Concrete/Concrete pavers: asphalt or concrete surrounding the lip should fall away from the lip to allow for water shedding. Degree of fall is the responsibility of the installer as it must comply with site conditions.

3. Reinforced concrete: the frame is placed in position on a reinforced concrete bed with a minimum* strength rating of 40Mpa* (min. depth 100mm) ensuring it is fully supported and ensuring that the surrounding concrete (+60mm depth for lip) is not protruding above the frame upper lip. Prevent voids in the concrete under the frame, especially near the housing.

   The concrete supporting the frame must be completely flat and is in complete contact with the underside of the frame.

   The exposed surface of the lip concrete around the frame should have a flat finish (compliant to local safety requirements).

4. Concrete slab: the concrete and reinforced concrete over it should have sufficient strength to support the weight of the vehicular traffic passing over or parked above it.

   Allow sufficient curing time of the concrete (depending on the ambient temperature) before vehicular traffic is allowed to pass over the cover.

5. Gravel: gravel materials should be compacted under the concrete slabs without placing any load on the sump/riser walls and skirt.

6. Care should be taken when compacting the material near and where it comes in contact with the sump, riser and skirt.

Minimum*: concrete strength rating to be in accordance with the Oil Company or Local Government specifications.
7.1 MATERIAL SPECIFICATION & INSTALLATION GUIDE

EN124:1994 Class D400 Vehicular and C250 Petroleum Forecourt Composite Access Covers

1. Bedding Mortar

We recommend Ultracrete Envirobed HA104® or equivalent.

Characteristics:
• Non-shrink
• 15 minute workability
• Can be used in wet/cold weather
• Compressive strength of 51N/mm² in 3 hours
• Tensile strength of 5.8N/mm² in 3 hours
• Set time of 30 minutes (temperature dependant)

Remove any old bedding or packing materials, and ensure the substrate is clean and sound. When using Envirobed HA104® the substrate should be wetted down prior to application of the mortar.

Envirobed HA104® should be mechanically mixed as follows; 1 unit of Envirobed powder with 1 unit of Envirobed liquid.

The amount of liquid required may be adjusted depending on the required consistency.

Envirobed HA104® should be immediately placed on the supporting structure, allowing a 5mm excess thickness and used within five minutes of mixing.

The SSC frame is lowered into position and placed on the bedding mortar ensuring that it is fully supported and checking that the frame does not overhang the mortar at any point.

Care should be taken to prevent voids in the bedding material under the frame, particularly in the vicinity of the cover seating.

The frame is tamped down into place, ensuring the correct level is obtained. This can be checked by placing a straight edge over the frame and surrounded surface. Exposed surfaces of the bedding mortar around the frame must be float finished, ensuring any voids or loose material is removed and the inside surface pointed to a smooth finish. Once the bedding mortar has achieved sufficient strength the back fill material is placed.
2. Back Fill Flowable Concrete
Industry Standards: BBA/HAPAS Approved. Meets with the specifications laid out in the SROH. We recommend Ultracrete’s QC10 F or equivalent.

Characteristics:
- Shrinkage compensated and fibre-reinforced
- Flowable
- 5 -10 minute workability
- Compressive strength 20N/mm² in 1.5 hours
- Flexural strength 6N/mm² final set, Tensile strength 3N/mm² final set
- Set time 10 - 20 minutes (depending on temperature)

QC10 F is mechanically or hand mixed by adding the bag of cement to the sand/aggregate and mixed with water until a smooth, flowable consistency is achieved. If a stiffer mix is required, reduce water accordingly until the desired consistency is achieved. *Reduced water will accelerate product set. Remove ponded water. The area to be filled should be wetted and the material placed within 5 minutes of mixing, to 60mm below the required surface fill level, and compacted ensuring no voids are present. The final surface is then rough floated to achieve a textured level surface ready to receive the wearing course.

3. Surface Course and Edge Sealant
Industry Standards: BBA/HAPAS Approved. Meets with the specification laid out in the SROH 2010, SROR 2003 DRDNI and NRA.

For Class 0, 1 and 2 Roads
We recommend Hot Rolled Asphalt (HRA) should be used in accordance with local Department of Transport requirements. Thrubeam covers are suitable for installations with HRA up to a maximum depth of 100mm.

For Class 2, 3 and Road
Hot Rolled Asphalt (HRA), Ultracrete Instant Road Repair® or equivalent. We recommend Ultracrete Instant Road Repair® or equivalent.

Characteristics:
- PSV65
- 10mm graded hard stone
- Excellent workability in all weather conditions
- Instantly trafficable
- 25kg bags or tubs for easy handling

Once the backfill concrete has reached sufficient strength, all horizontal and vertical edges, including the manhole frame should be sprayed with Ultracrete SCJ Seal and Tack Spray ensuring all the surfaces are liberally covered.

The use of Ultracrete Instant Road Repair® is recommended (45mm compacted to 30mm - 2 layers required). Hot lay materials can be used.

Attention: The cover installation guideline is not exhaustive. It is always recommended to refer to national rules and oil company regulations.
Bedding mortar applied

Setting of the frame on the bedding mortar

Backfill flowable concrete

Surface course

Surface course and edge sealant

Reinstatement of openings: Compliant with SROH

Hot lay asphalt

Concrete: 40Nm Minimum

Bedding Mortar: 40Nm Minimum

Minimum depth 10mm

Cold lay asphalt concrete

QC10 F Rapid Strength Concrete

Ultracrete ha104 Bedding Mortar

Minimum depth 10mm

Instarmac Reinstatement Products

Concrete: 40Nm Minimum

Tarmacadum

Concrete: 40Nm Minimum

Hot lay asphalt

Cold lay asphalt concrete

QC10 F Rapid Strength Concrete

Ultracrete ha104 Bedding Mortar

Minimum depth 10mm

Instarmac Reinstatement Products

The frame is to be installed to the appropriate standard/specification for that particular installation. For reference purposes only. This drawing is not a specification.
8 MANHOLE COVERS

SMARTFLEX Composite Manhole Covers are designed to offer a light weight alternative to steel manhole covers. These covers are class C250 (up to 25 tons) in accordance with EN124 standard.

SMARTFLEX Composite Manhole Covers combine technology, design and composite materials with reliable manufacturing processes.

### STAM36WTCLP (available also with Dip Cap)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Rating:</td>
<td>EN124:1994 Class C250</td>
</tr>
<tr>
<td>Clear Opening:</td>
<td>900mm Diameter (35 7/16&quot;)</td>
</tr>
<tr>
<td>External Dimensions:</td>
<td>962mm Diameter (37 7/8&quot;)</td>
</tr>
<tr>
<td>Weight:</td>
<td>31kg (68.3lb)</td>
</tr>
<tr>
<td>Combined weight with frame:</td>
<td>46kg (101.4lb)</td>
</tr>
<tr>
<td>Lifting points:</td>
<td>Single key housing</td>
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<tr>
<td>Tread depth:</td>
<td>Tread depth complies with EN124:1994</td>
</tr>
<tr>
<td>Tread type:</td>
<td>Embedded aggregate – uni-directional</td>
</tr>
</tbody>
</table>

**Corrosion/Chemical resistance:**
All component parts are resistant to chemical attack, diesel, petrol, salt and water or a combination of the above over the lifespan of the cover.

**Material:**
Advanced fibre glass composite.

**Security Features:**
Lock and security plug (lock cannot be left open on replacement of cover).

**Frame Specification**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Rating:</td>
<td>EN124:1994 Class C250</td>
</tr>
<tr>
<td>Clear Opening:</td>
<td>900mm Diameter (35 7/16&quot;)</td>
</tr>
<tr>
<td>Weight:</td>
<td>15kg (33lb)</td>
</tr>
<tr>
<td>External Dimensions:</td>
<td>1100mm Diameter (43 5/16&quot;)</td>
</tr>
<tr>
<td>Material:</td>
<td>Advanced fibre glass composite</td>
</tr>
</tbody>
</table>
19STAM42WTCLP

STAM42WTCLP (available also with Dip Cap)

**Load Rating:** EN124:1994 Class C250

**Clear Opening:** 1060mm Diameter (41 3/4”)

**External Dimensions:** 1122mm Diameter (44 3/16”)

**Weight:** 40kg (88.2lb) Complied weight with frame 53kg (116.8lb)

**Lifting points:** Single key housing

**Tread depth:** Tread depth complies with EN124:1994

**Tread type:** Embedded aggregate – uni-directional

**Corrosion/Chemical resistance:**
All component parts are resistant to chemical attack, diesel, petrol, salt and water or a combination of the above over the lifespan of the cover.

**Material:**
Advanced fibre glass composite.

**Security Features:**
Lock and security plug (lock cannot be left open on replacement of cover).

**Frame Specification**

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Load Rating</strong></td>
<td>EN124:1994 Class C250</td>
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<tr>
<td><strong>Clear Opening</strong></td>
<td>1060mm Diameter (41 3/4”)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>13kg (28.7lb)</td>
</tr>
<tr>
<td><strong>External Dimensions</strong></td>
<td>1245.9mm Diameter (49 1/16”)</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Advanced fibre glass composite</td>
</tr>
<tr>
<td>Part Number</td>
<td>Description</td>
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<td>------------------------------------------------------------------------------</td>
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<tr>
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<tr>
<td>19STAM36WTCLP</td>
<td>960 mm (36”) Raintight composite manhole cover, frame, seal, plug and lock</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td>19STAM42WTCLP</td>
<td>1120 mm (42”) Raintight composite manhole cover, frame, seal, plug and lock</td>
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<tr>
<td>19STAM36WTCLPDC</td>
<td>960 mm (36”) Raintight composite manhole cover, frame, seal, plug and lock</td>
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<td></td>
<td>and dip cap</td>
</tr>
<tr>
<td>19STAM42WTCLPDC</td>
<td>1120 mm (42”) Raintight composite manhole cover, frame, seal, plug, lock and</td>
</tr>
<tr>
<td></td>
<td>dip cap</td>
</tr>
</tbody>
</table>

Two different removal/replacement tools are also available, with or without seal breaker.

9 SKIRTS FOR MANHOLE COVERS

Smartflex skirts are made of polyethylene and are designed to fit perfectly the frame of the covers. Thanks to their conic design they can be easily handled and transported by stacking them one on top of the other.
**MISURE:**

**WEIGHT:**

**DISEGNER DATE:**

**CONTROLLER DATE:**

**REPL. DRAW. PROJECT No SHEET OF:**

**QUOTE WITHOUT INDICATION OF TOLERANCE LEVEL OF PRECISION**

**TYPE:** UNI EN 22768

**ISSUE DATE**

**MOLD CODE:**

**DRAWING No :**

**Rev ART SCALE BEVELS:**

**UNLISTED**

**0.5X45°**

**VERIFICATION DATE**

**RUGOSITY:**

**FINISHING:**

**HEAT TREATMENT:**

**ITEM:**

**MATERIAL:**

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*All dimensions have to be considered in millimeters if not otherwise mentioned.*