# PLASTIFORM TECHNICAL DATA SHEET

## F20




## Key information

Since April 2021, F20 has been PMUC-approved under No. PMUC 04-0141.

- **Shape Memory** Impression.
- No **dimensional shrinkage**.
- **Recommended** for **non-contact** measurement.
- Not compatible with the **Double Blade Cutter.**

## Description

Plastiform is a high-precision silicone-based impression material used primarily for quality control and non-destructive dimensional inspection in industry.
It is a two-component, addition-curing, 1:1 (one to one) mixture, curing without heat build-up or odor.

## Technical data

| Initial Consistency | Final Consistency | Final Hardness | Max. Removal Constraint (definition page 6) | Elongation at break * | Impression resolution ** |
|---|---|---|---|---|---|
| Fluid | Very Flexible | 18 +/- 2 Shore A | 30 % | 200 % | 1 µm |

| Density at 20°C | Temperature of decomposition | Flash point | Boiling point | Ignition temperature |
|---|---|---|---|---|
| 1,22 g/cm³ | ND | >130 °C | >300 °C | ND |

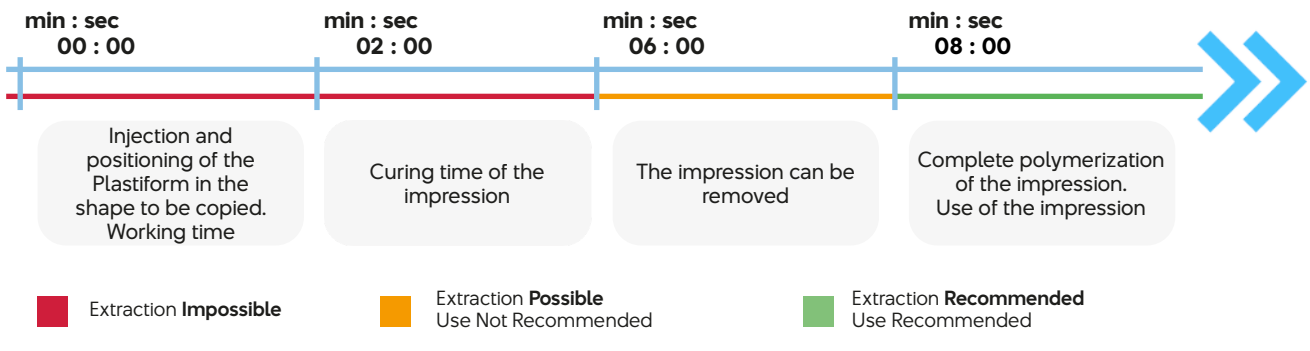
* Elongation at break defines the ability of a material to elongate before breaking when loaded in tension.

** The impression resolution is the smallest variation of the measured quantity that produces a perceptible variation of the indication delivered by the measuring instrument.

**ND -** Not Determined

## Recommended application times (Data at 23 °C / 50 % RH)

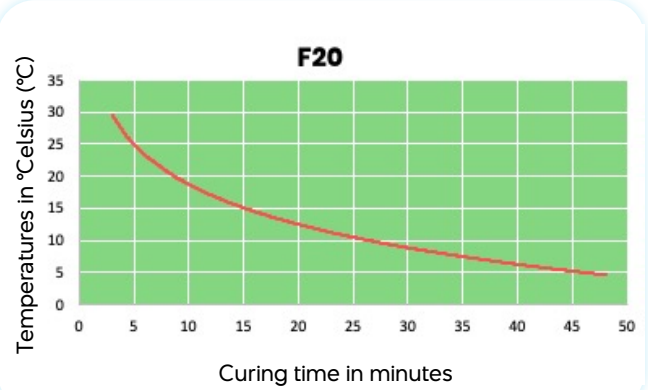
It is recommended to wait for complete polymerization before removing and using the impressions.



# F20

## Evolution of curing time / product temperature

Temperature is a factor with a direct influence on the curing time of Plastiform products. It is recommended to use the products at room temperature (~23°C).




## Applications

Thanks to its high initial fluidity (flowing product), F20 can easily be injected in any type of part, whether it is small (diameter up to 0.1 mm) or medium size.

The final impression is very flexible (hardness of 18 +/- 2 Shore A), which allows it to be strongly stretched and deformed during demolding.
The F20 is therefore recommended for taking impressions in **complex internal shapes** (threads, internal grooves and slots, etc.). However, it is important that the Removal Constraint does not exceed 30%.

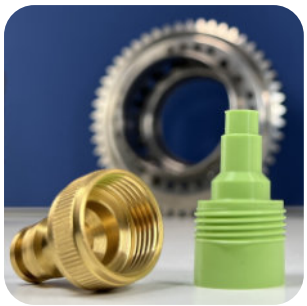
All the surface details (shape, size, appearance, surface condition...) are reproduced very precisely. The impression is not altered during the extraction, which allows for an optimal result.



Example of use of the F20 for complete internal form control

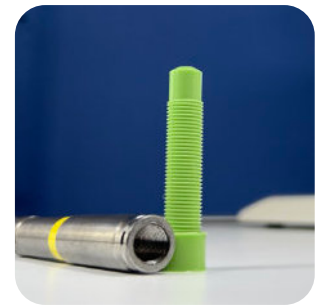
## Secondary Applications

In addition to its dimensional control qualities, the F20 can be used for protection or masking. It is also a good product for the creation of custom seals.









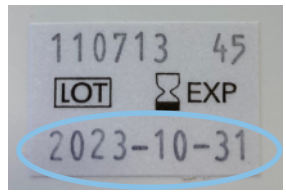
## Material compatibility

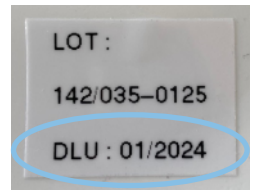
Plastiform can be used on all types of materials. However, an alteration of the chemical reaction of polymerization can occur in contact with latex, sulfur compounds, graphite, oils and greases, as well as certain titanium alloys (non-exhaustive list).
In general, the user is advised to conduct comprehensive tests to determine the suitability, effectiveness and safety of Plastiform for the intended application.

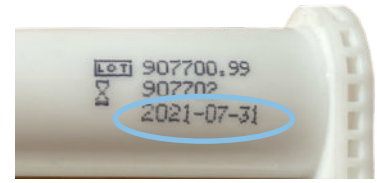
## Shelf life / Storage / Conservation

The expiry date of Plastiforms is indicated on the products. It varies between 24 and 36 months (depending on the product) after the manufacturing of the product, if it is kept in its original packaging, well closed, and stored in a dry and temperate environment (between 15 and 25°C).

**The expiry Date is indicated on the cartridge or under the jar as follows:**




Once the product's validity date has been exceeded, Rivelec no longer guarantees the performance shown on this technical data sheet. It is then up to the user to proceed with tests, in order to determine the adequacy, the efficiency and the safety of Plastiform products with the application he is considering. Nevertheless, Rivelec has been able to confirm the conformity of Plastiform on products manufactured more than 5 years ago, untouched and stored in nominal conditions.

As long as the materials have been stored at room temperature and that the original packaging has not been opened, Rivelec considers that it is safe to use the product up to one year after its expiration date. Rivelec recommends that tests be carried out by the customer before using expired products.
A change in appearance or consistency, or an abnormally long polymerization time, may indicate that the product has deteriorated.

Plastiform's performance can be potentially impaired if the products have been exposed to wide temperature variations or extreme temperatures (< 0 °C or > 55 °C).

In order not to pollute the components and thus alter the homogeneous mixture of Plastiform and the 1/1 ratio of the base and the catalyst, take care not to interchange the caps and to close the cartridges well after use.

## Health & Environment

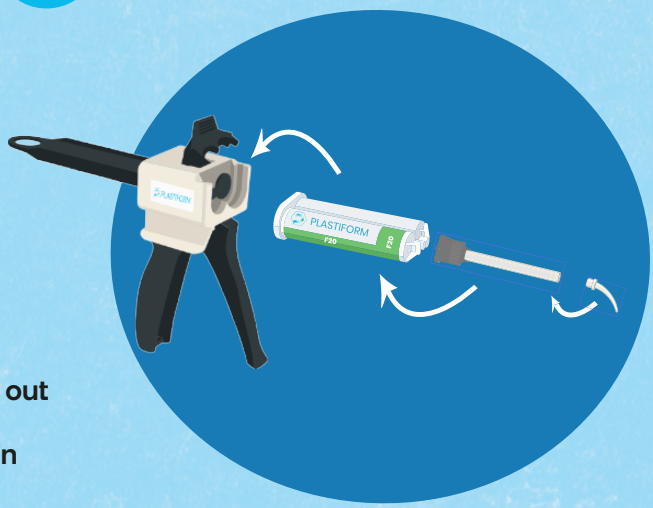
- Plastiforms are **non-toxic** and can be handled without PPE.
- None of the raw materials used in the manufacture of Plastiform products are classified as **CMR** (carcinogenic, mutagenic or toxic for reproduction).
- No Volatile Organic Compounds **(VOCs)** are used as raw materials in the manufacture of Plastiform.
- No substances / raw materials containing substances mentioned in the **REACH SVHC** list in a concentration > 0.1 % are present in the composition of Plastiform products.
- The polydimethylsiloxanes used in the manufacture of Plastiform products contain a maximum of 0.1% of **volatile cyclic siloxanes** D4, D5 and D6.
- No **nanoparticles** are used in the manufacturing of Plastiform products.
- No substance / raw material containing **substances of animal origin** is present in the composition of Plastiform products.
- No **halogenated hydrocarbons** (chlorinated, fluorinated, brominated) are present in elemental form in Plastiform.
- No substance / raw material containing **latex** is present in the composition of Plastiform products.
- Plastiform containers and impressions are classified as **non-hazardous non-inert waste** and more precisely as waste from organic chemical processes under code 07 02 17 "waste containing silicones" (according to annex I of article R 541-8 of the Environmental Code).

## Application procedure

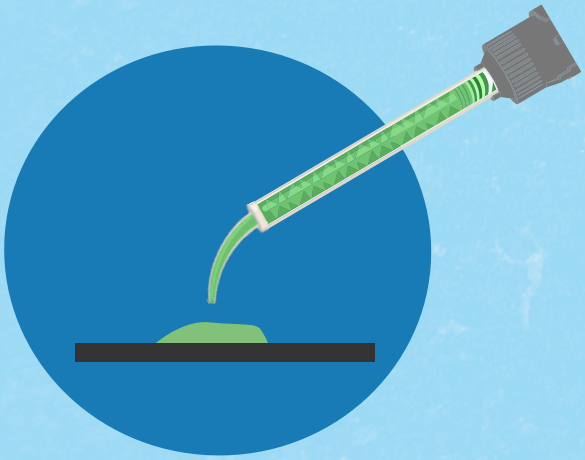
1 Degrease the part thoroughly.



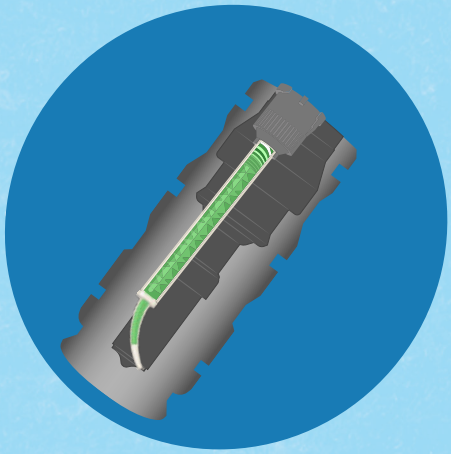
2 Assemble the cartridge with the mixing nozzle, then mount it on the gun.



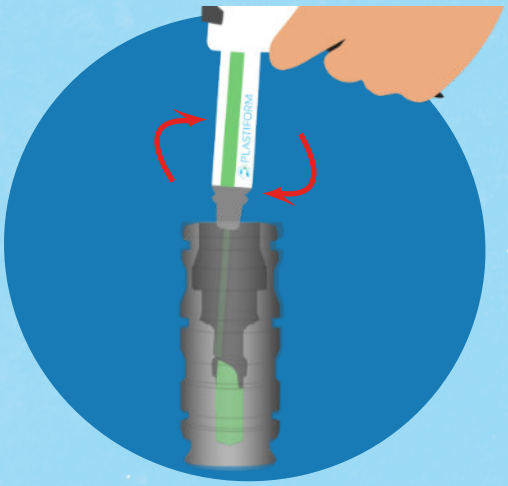

3 Discard the first bead of product that comes out of the mixing nozzle. Check that the 2 components come out of the mixing nozzle in equal quantities (homogeneous color).



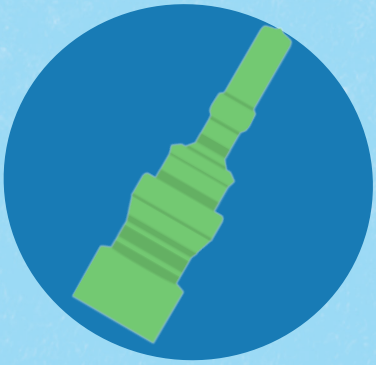
4 Insert the mixing nozzle by putting it in direct contact with the surface of the part in order to avoid creating bubbles.



5 Inject the product with a circular motion. Keep the mixing nozzle immersed and in contact with the surface of the part.



6 Wait until the curing time of the Plastiform is reached, then remove the impression.



## Factors that may influence the measurement results

There is always some unavoidable margin of error between the measured value and the "true value".
The causes of uncertainty can be due to several factors, either during the making of the impression or during its measurement, and can therefore have an impact on the measurement result. The following is a non-exhaustive list of causes of uncertainty:

### Measuring device

The choice of measuring device can affect the value measured on the impression. The following should be taken into account:

- **Compatibility between Device/Plastiform:** Some instruments are perfectly compatible with Plastiform impressions, others will have more difficulties. This is why a preliminary test is always recommended, especially for machines with optical detection (laser, scan, light...)
- **Calibration of the device**
- **Uncertainty associated with the instrument**
- **Contact pressure of the instrument:** too much contact pressure can deform the impression and distort the measurement result.

### Method

The impression must be taken according to the procedure in the instructions for use and the recommendations in the data sheet.

- **Surface pollution:** The original surface of the part must be perfectly clean. A poorly degreased surface can lead to poor curing of the impression, and a poorly cleaned surface will have dust and residues that will pollute the Plastiform impression.

- **Plastiform product selection:** The choice of the Plastiform is essential. It must be adapted to the application (shape of the part, orientation of the part, extraction constraints, measuring system used, etc.).
- **Implementation:** Incorrect application of the product could lead to bubbles or defects in the final impression.

- **Removing the impression:** The impression must be sufficiently hard before it is removed (curing time). Premature removal of the impression will have an impact on its accuracy.
- **Use of the impression:** The impression must be measured or evaluated after it has fully cured, as indicated on the data sheet.

### Operator

- **Handling the impression:** The impression must be handled with care. The control surface must be preserved throughout the production, extraction and handling process.
- **Cutting with Double Blade Cutter:** A bad cut with the Double Blade Cutter can induce a loss of measurement precision (parallelism, deformation...).
- **Positioning the impression on the measuring device:** Since Plastiform materials are rather soft (even the most rigid ones), the impressions must be positioned so that they are not deformed during the measurement.
- **Measurement size:** Beyond a certain measurement distance, the margin of error logically tends to increase. This factor must be taken into account in the measurement strategy.

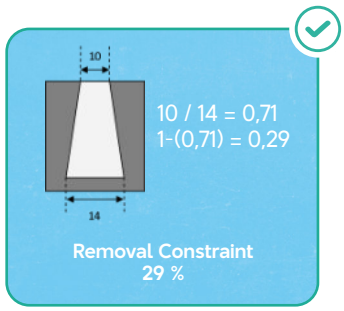
### Plastiform Impression

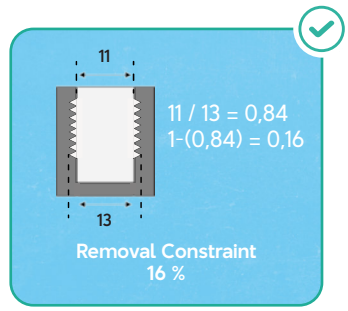
- **Impression Volume:** If the impression is too large, there is a risk that it will deform under its own weight.
- **Cleanliness:** Plastiform material is slightly electrostatic and therefore attracts dust. A cleaning of the impression (with the help of Plastin) may be necessary so that this does not disturb the measurement.
- **Impression Condition:** The impression may be altered during handling (scratches, tears, deformations), resulting in geometrical defects. Although Plastiforms are resistant, they must be handled with the utmost care in order to obtain optimal results.
- **Adhesion:** Soft impressions may adhere slightly to surfaces. Incorrect positioning on the measurement support can therefore deform them.

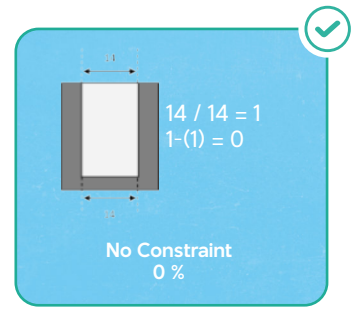
## Removal Constraint

Determining the Removal Constraint of your part allows you to select the right Plastiform.
When taking an impression of a part, complex internal shapes can complicate the extraction: groove, internal angles, threading... We then say that there is a Removal Constraint (or undercut).
It is calculated using the following formula:

$$1 - \left[ \frac{\text{Minimum size of the extraction hole}}{\text{Maximum internal dimension}} \right] = \text{Removal Constraint (\%)}$$




The **F20** has a **30%** Removal Constraint

**The higher the percentage, the softer and more elastic the product will need to be to be removed.**
For a Removal Constraint = 29%, it is necessary to choose a product which accepts a constraint **higher than 29%**: F30 Max, F20 or F20 XL for example.

## Available Packaging

Each Plastiform cartridge box includes mixing nozzles and nozzle tips.




CA-F20-2

- **2 Cartridges of F20**
- **12 Mixing nozzles**
- **6 Nozzle tips**




CA-F20-8

- **8 Cartridges of F20**
- **48 Mixing nozzles**
- **6 Nozzle tips**




CA-F20-16

- **16 Cartridges of F20**
- **48 Mixing nozzles**
- **6 Nozzle tips**

The information provided in our data sheets is based on our current knowledge and on the results of tests carried out under specific conditions. These data are in no way intended to establish a specification.
It is the user's responsibility to carry out complete tests under his own responsibility, in order to determine the suitability, efficiency and safety of Plastiform products for his intended application.
Rivelec cannot guarantee the compatibility of a Plastiform product with any application.
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