

INSTRUCTION ON USING GRACO® EQUIPMENT

Standardized process chart for applying heat-insulating coatings of PROTERM® series with GRACO® high-pressure airless sprayers.

1. General notes

One of the most important criteria of works performance is maximizing the efficiency while reducing the labor consumption. The same tasks are faced by heat insulation works. Though the coatings of PROTERM® series are easy to apply with a paint brush, the areas over 100 m² are more efficiently treated by using mechanical aids – high-pressure airless sprayers.

Please note that the energy-saving coatings of the PROTERM® series differ substantially from conventional paintwork materials – in their viscosity, containing brittle elements in the form of ceramic microspheres in the structure etc. This poses special requirements to the equipment, used for their application.

Use only recommended and tested airless sprayers.

By now the representatives of GRACO® have tested and recommended for usage a number of sprayers. The models of these sprayers and the guidelines for their usage are presented below. It is necessary to use only the recommended spray guns, nozzles and tips for applying PROTERM® coatings. Recommendations in selecting the equipment are given below. If you have any questions – contact the manufacturer or the PROTERM® representative in your region;

2. List of equipment for working with heat-insulating coatings of PROTERM® series

The list of airless sprayers, which would be the most optimal equipment for applying energy-saving coatings of this series, is presented below. Please use it as a detailed equipment guide.

Electrically powered equipment:



GRACO MARK V Pro-Connect

This type of sprayers is the most widely and successfully used for working with heat-insulating coatings of the PROTERM® series.

This sprayer is equipped with SMARTCONTROL 2.0 system, which provides working parameters monitoring.

Parameters of the sprayer:

Type of drive – electrical (220 V, 50 Hz);

Drive power – 1.65 kW;

Maximum performance – 5.5 l /min;

Maximum working pressure – 230 bar;

Working pressure when working with PROTERM® coatings – 80 bar;

Weight – 59 kg;

Requirements for generator – 5 kW;

As additional equipment the mounting of a 90 liters tank is possible; this allows avoiding replacing buckets too often.

When using such tank– mix the PROTERM® material regularly (every 5 minutes)!



GRACO Ultra® MAX II (models 695, 795 and 1095)

Apparatuses of the Ultra Max series are designed for spraying high-viscosity and medium-viscosity materials. They are ideal for accomplishing paint work at the professional construction and repairs.

ULTRA® MAX II 695 is a universal and multifunctional apparatus, ideal for finishing works.

ULTRA® MAX II 795 is designed for large-scale housing construction.

ULTRA® MAX II 1095 is used for spraying high-viscosity materials. It is designed in accordance with the requirements of large-scale housing construction, commercial industrial works and capital construction.

Selection of a certain model depends on the complexity of an object and on the amount of works.

Parameters of ULTRA® MAX II sprayers:

	ULTRA® MAX II 695	ULTRA® MAX II 795	ULTRA® MAX II 1095
Type of drive	Electric brushless DC drive (220 V, 50 Hz)		
Drive power, kW	1.3	1.5	1.65
Maximum performance, l/min	3	3.6	4.1
Maximum working pressure, bar	230	230	230
Maximum working pressure at working with PROTERM® materials, bar	80	80	80
Weight, kg	43	45	55
Requirements for generator, kW	5		



GRACO ST® MAX II 395

This sprayer is used for small amounts of works, as it only on full capacity provides the pressure required for PROTERM® coatings application.

If you use THIS sprayer, it is necessary:

To dilute the PROTERM® material at the ratio 1:20
(1 liter of water for 20 liters of PROTERM®);

To use larger nozzles – x21 or x23 or, correspondingly, 0.021 or 0.023 inches;

To perform application with short pauses to maintain the necessary pressure in the system;

To set the lowest value of pressure in the sprayer, acceptable to apply the PROTERM® material.

Petrol-driven equipment:



GRACO G MAX II (models 5900 and 7900)

Autonomous petrol-driven airless sprayers of the G MAX series are designed for working in conditions when there is no electric supply or compressed-air lines.

Parameters of the sprayer G MAX II 5900 HD ProConnect Optimum:

Type of drive – petrol (Honda);

Drive power – 4.1 kW;

Maximum performance – 6.0 l/min;

Maximum working pressure – 230 bar;

Working pressure when working with PROTERM® coatings – 80 bar;

Weight – 64 kg;

As additional equipment the mounting of a 90 liters tank is possible; this allows avoiding replacing buckets too often.

When using such tank– mix the PROTERM® material regularly (every 5 minutes!)



Parameters of G MAX II 7900 HD ProConnect Optimum sprayer:

Type of drive – petrol (Honda);

Drive power – 4.8 kW;

Maximum performance – 8.3 l/min;

Maximum working pressure – 230 bar;

Working pressure when working with PROTERM® coatings – 80 bar;

Weight – 67 kg;

The autonomous operation of the sprayer can be increased by using a loading bin.

When using such bin – mix the PROTERM® material regularly (every 5 minutes)!

Pneumatically-powered equipment:



GRACO® XTREME KING 45:1

These apparatuses are powerful and easy-to-work; they are designed for applying highly viscous and extremely viscous materials in heavy-duty conditions. Low maintenance costs. Increased service life: rods are manufactured by the PlasmsCoat technology, and the seals Xtreme Seal provide more than twofold increase of the service life. The apparatus can be used in heavy-duty conditions. The quick-connect coupling allows quick and easy connection of the pump rod without using special tools.

Parameters of the sprayer XTREME King 45:1:

Type of drive – pneumatic NXT 6500;
Maximum inlet pressure – 7 bar;
Maximum performance – 8.3 l/min;
Maximum working pressure – 313 bar;
Working pressure when working with PROTERM® coatings – 80 bar;
Weight – 117 kg;

3. Recommendations on equipment setting and parts selection

For the correct operation of Graco® airless sprayers it is necessary to follow regulations for their setting. This is a crucial point, as it ensures preserving the integrity of the PROTERM® coating during application and its subsequent drying. The key component of the PROTERM® coatings is microspheres, which are glass vacuumized granules. These granules provide the thermal properties of the coating, as well as maintain its thickness.

General recommendations:

- Before you start working, remove ALL filters from the apparatus (including filters in spray guns, if there are any)! Filters can retain microspheres, which are in the PROTERM® material, so they should be removed.
- The apparatus should be clean and properly functioning. The usage of stained or clogged equipment can reduce its efficiency at low pressure and require higher pressure, which in its turn can lead to the destruction of the PROTERM® material.
- The PROTERM® coating should be applied at minimum working pressure, no more than 90 bar. The advantage of Graco® airless sprayers is the SmartControl system, which can maintain constant operating parameters (pressure, material consumption etc.) during the whole period of work.
- **The optimum pressure range when working with the PROTERM® material is from 70 to 90 bar.**
- The recommended hose length is 45 meters. Using longer hoses results in the increase of pressure in the equipment for pumping for a longer distance, which in its turn can lead to the destruction of the PROTERM® material.
- Use only recommended spray guns, tips and nozzles, as all of this has also influence on the PROTERM® material during application. The detailed guidelines in selecting auxiliary components are given below.
- Material PROTERM® has a unique multi-component composition. So, after some time the material can be layered to fractions inside a storing container – the light-weight microspheres can float to the surface, and the liquid components and the binder can sink. As during airless spraying the material is usually taken from the bottom of the tank, the material should be mixed during application AT LEAST once in 5-7 minutes, so that the coating remains homogeneous during application. This is especially important when using additional tanks, which can contain several bucketfuls of the material.

4. Recommended spray guns for airless sprayers:



GRACO CONTRACTOR II

One of the lightest and easiest-to-use airless spray guns. The Graco® engineers have succeeded in reducing the required trigger pressure effort by 30%, which considerably decreases the fatiguing of a worker. The spray gun is equipped with a special double filter, and a swivel joint. This allows preventing the frequent necessity of nozzle clearing and the twisting of a high-pressure hose.

WARNING! Remove the filter from the spray gun before the application of PROTERM® coating.



GRACO XTR5 и XTR7

New spray guns, designed for high-viscosity materials application. They are equipped with a special high-wear-resistant sprayer head and nozzle. They are designed for airless spraying and can be used for large amounts of works. These spray guns are used with pneumatically-powered equipment.

WARNING! Remove the filter from the spray gun before the application of PROTERM® coating.



GRACO FTX

The spray gun GRACO FTX is designed for finishing works and general painting in the areas, which require increased maneuverability. It is the most lightweight airless spray gun at the Russian market. It comes with airless spraying equipment of the GRACO ULTRA MAX series. It can be also completed with GRACO MARK V equipment.

This spray gun can be equipped with either two-finger trigger, or four-finger trigger.

WARNING! Remove the filter from the spray gun before the application of PROTERM® coating.

Using the spray gun GRACO SILVER GUN is not recommended, as it is difficult for use in applying PROTERM® coatings.

Recommended nozzles and tip guards GRACO®:

To achieve the best result of application the following factors should be taken into account at selecting a nozzle:



1. Spray band width:

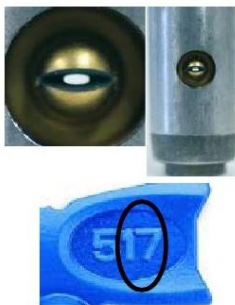
Spray band width is determined by spray cone angle at a distance of 30 cm from the surface.

The cone angle is defined by the first number in the nozzle marking. Correlation of nozzle marking number with spray cone angle and spray band width is given below:

First number in the nozzle marking	Spray cone angle, degrees	Spray band width, cm
1	10	5
2	20	10
3	30	15
4	40	20
5	50	25
6	60	30
7	70	35
8	80	40
9	90	45

For example, in the picture to the right number 5 means that spray cone angle amounts to 50 degrees, and to find spray band width the first number is multiplied by 5: (5 x 5 = 25 cm)

2. Nozzle size and the maximum capacity of the apparatus:



Nozzle size indicates the approximate material consumption. The nozzle size is defined by the last two numbers in nozzle marking.

In this example (see picture to the right) number **17** means that the nozzle opening size is **0.017** inches or **0.43** mm

Each type of apparatuses has its maximum capacity, and it should be taken into account when selecting components.

For working with PROTERM® coatings the nozzles in the range from x17 to x23 are recommended.

Recommended nozzles for PROTERM® materials application.		
119	121	123
219	221	223
319	321	323
419	421	423
519	521	523
619	621	623
719	721	723
819	821	823

The selection of nozzle size depends on the type and dimensions of the surface to be insulated. For application on large flat surfaces (buildings' façades, metal tanks, hangars etc.) the larger spray cone angle and nozzle size can be used, while small areas with complex geometry (pipelines, flanges etc.) require a smaller spray cone angle and a smaller nozzle diameter.

3. Wear-resistance and specialization of nozzles



Nozzles are classified not only by their size and spray cone angle, but also by their wear-resistance and their specialization. We recommend using wear-resistant nozzles for reasons of durability.

RAC X and RAC 5 nozzles are recommended (Blue or Black).



Tip Guards (Blue or Orange) can be used with nozzles RAC X and RAC 5.



The XHD RAC (Grey) nozzles or tip guards can be also used.

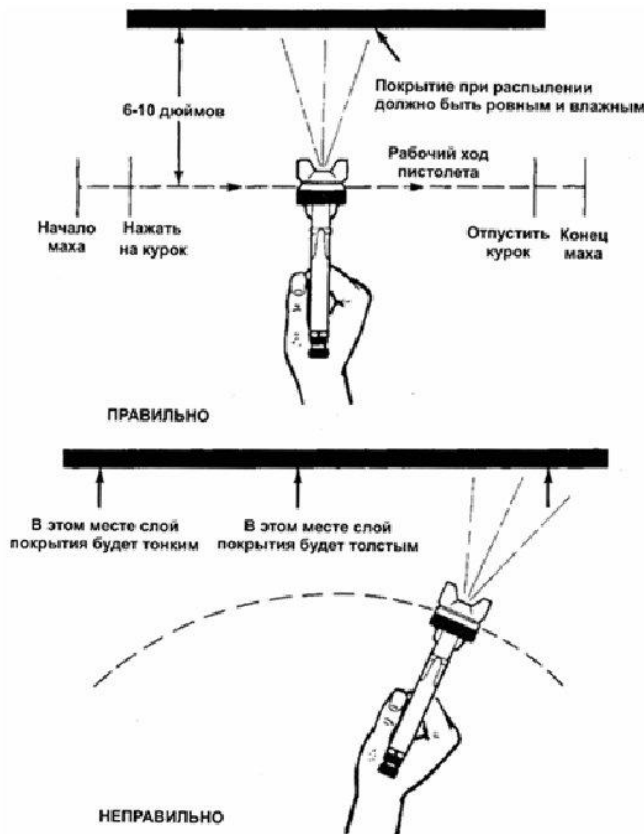


Ask for details about nozzles and tip guards specifications from the representatives of Graco®.

Recommendations on material application and operation of a spray gun

A spray gun can be technically perfect, but if a worker doesn't follow the proper spraying technique, the useful result can not be achieved. Incorrect methods of material application can increase costs considerably. In order to maximize the functions and performance characteristics of a spray gun:

- Check that you hold the spray gun perpendicularly to the surface, as it is shown in the picture. Turning the spray gun from side to side, moving it nearer or away from the surface results in deflecting a large amount of material from the treated surface and the losses of the material.
- The arc movement of the spray gun would result in the uneven film thickness. Move your hand along the whole surface, keeping the wrist straight.
- Maintain the uniform speed of hand movement to achieve the proper film thickness.
- The overlapping of the material should be no more than 50%. The larger overlapping would require higher speed to obtain the uniform coating.



Correct and incorrect spraying technique.

The excessive consumption of sprayed material is made of the amount of the material, which is lost at missing the treated surface. To minimize such losses, be careful to pull the trigger properly. Don't pull the trigger when the spray gun doesn't move. Using the properly selected pressure of material spraying would prevent overconsumption; such mode would also reduce losses of the material caused by its bouncing off the treated surface (and keep the integrity of the coating structure). The spray gun should be held far enough from the surface, so that the spray band could be increased to the appropriate size. The optimal distance is usually from 6 to 10 inches (from 15 to 25 cm), as it is shown in the picture above.

In case of nonobservance of the material application and storage instruction, the manufacturer will not be liable for the quality of coating.

Approved by _____ A.V. Zapara

I have read and understood the process chart _____

(job position)

(signature)

(full name)

Warning! All the aforementioned information is obtained as a result of laboratory testing and operational experience, and based on the material components' characteristics, but it is not warranty information. Due to impossibility to control the conditions of material application and the ready coating use, the manufacturer assumes no liability for the result, or for the possible expenses or damage, caused by using this product. The user evaluates the expedience of using the product in each specific case at his discretion and accepts all risks, connected with using this material. The product is intended solely for industrial usage by qualified personnel.