

Bronya®
SUPERFINE HEAT INSULATION

**Flowsheet: Application of Bronya® liquid ceramic heat insulation
with Graco® airless high-pressure sprayers**

1. General recommendations

Maximal efficiency apart from reduction of working hours is an important criterion during works. Similar tasks are set for heat insulation works. Despite simplicity of Bronya® application with a painting brush, for areas of more than 100 m² it is more efficient to use mechanical devices, airless high-pressure sprayers.

Please note, that Bronya® liquid ceramic heat insulation is considerably different from common paint film in respect of viscosity, brittle elements such as ceramic microsphere etc. in its structure. It poses certain requirements for equipment used for application:

- 1) **Only airless sprayers are allowed.** Common compressor sprayers can't be applied as because of the low pressure they do not pump the material, if high pressure is set, the speed rate of the outgoing material from a tip is so high that the microsphere smashes onto the surface being coated. Moreover, during application Bronya® material forms a mixture with air in a spray gun, which causes damage of the structure.

Only recommended and approved airless sprayers should be used. So far we have tested and recommended a number of Graco sprayers. Certain models and recommendations concerning their adjustment are given below. Equipment with an excessive mechanical effect on material, for example, membrane and gear pumps, destroy material particles. Do not use such equipment for heat insulation application.

DO NOT USE WAGNER, POTGUN, MKM SPRAYERS OR THEIR CHINESE "ANALOGUES"!!!

- 2) **Recommended guns, tips and guards for works with Bronya® should be used.** Selection recommendations are given below. If you have any questions please feel free to contact a manufacturer or a representative of Bronya® in your region.
- 3) **Equipment should be appropriately adjusted: all filters should be removed, correct pressure should be set etc.**

IMPORTANT!!! If inappropriate equipment is used or incorrect adjustment was made there is a major risk of damage of the main Bronya® component, ceramic microsphere, which leads to a considerable overrun of material because of significant shrinkage and, which is the most important, to annulment of thermophysical properties of the coating.

2. Recommended list of equipment for Bronya® polymer heat insulation

Further we specify sprayers, which are the best devices for application of polymer heat insulation. Please, use this list as a detailed guidance. Description of airless sprayers for liquid ceramic heat insulation is given below.

Devices with electric motors:

GRACO MARK V Pro-Connect

This type of sprayer is most widely and successfully used for liquid ceramic heat insulation of Bronya® series.

This sprayer is equipped with SMARTCONTROL 2.0 system, which controls operating parameters.

Sprayer specifications:

- Motor type: electric (220 V, 50 Hz)
- Motor rating: 1.65 kW
- Maximum capacity: 5.5 l/min
- Maximum working pressure: 230 bar
- Maximum permitted pressure for Bronya® application: 80 bar
- Weight: 59 kg
- Generator requirements: 5 kW

A 90-liter tank could be installed as additional equipment; it will allow being less distracted for a change of buckets during application.

If you use a tank, you should stir Bronya® material regularly (once in 3-5 minutes)!

***Do not exceed rotations while stirring – maximum 200 rpm.**

GRACO Ultra MAX II (695, 795 and 1095)

Ultra Max devices are designed for application of material with a medium and high viscosity. They perfectly fit for painting in professional construction and repairs.

ULTRA ® MAX II 695 is a universal and multifunctional device. It's ideal for finishing works.

ULTRA ® MAX II 795 was created for big volumes and large-scale housing construction.

ULTRA ® MAX II 1095 is used for application of materials with a high viscosity. It was designed for large-scale housing construction, commercial and industrial works and capital construction.

Option of a certain model depends on complexity of facilities and a volume of works.

Specifications of **UltraMAX II** sprayers:

	ULTRA ® MAX II 695	ULTRA ® MAX II 795	ULTRA ® MAX II 1095
Motor type	Electric direct-current brushless (220 V, 50 Hz)		
Motor rating, kW	1.3	1.5	1.65
Maximum capacity, l/min	3	3.6	4.1
Maximum pressure, bar		230	
Maximum working pressure for Bronya®, bar	80		
Weight, kg	43	45	55
Generator requirements, kW	5		

GRACO ST MAX II (495 and 595)

Mobile, simple in maintenance and operation. Electrically powered, 220 V; perfectly fits for application of paint materials with a medium viscosity. Small dimensions and weight of these sprayers allow using them in a restricted space and at different heights.

Graco ST MAX II is a start up range of sprayers for professional painting contractors.

Specifications of ST MAX II 495 (Stand Mount):

- Motor type: electric (220 V, 50 Hz)
- Motor rating: 0.89 kW
- Maximum capacity: 2.1 l/min
- Maximum working pressure: 230 bar
- Maximum permitted pressure for Bronya® application: 80 bar
- Weight: 15.5 kg
- Generator requirements: 4 kW

Specifications of ST MAX II 595 (Hi-Boy):

- Motor type: electric (220 V, 50 Hz)
- Motor rating: 1.05 kW
- Maximum capacity: 2.3 l/min
- Maximum working pressure: 230 bar
- Maximum permitted pressure for Bronya® application: 80 bar
- Weight: 33 kg
- Generator requirements: 7 kW

GRACO ST MAX II 395

This sprayer is used only for small-scale works as it provides the necessary pressure for Bronya® application strained to the limit.

If you use THIS sprayer, the following actions should be made:

- to dilute Bronya® material in the ratio of 1:20 (1 liter of water for 20 liters of Bronya®);
- to use larger tips: x21 or x23, 0.021 or 0.023, respectively;
- application should be made with short breaks to maintain the necessary pressure in the system;
- pressure on the sprayers should be minimum, possible for Bronya® application.

Devices with gasoline motors

GRACO GMAX II (5900 and 7900)

Autonomous airless spray devices of GMax series are equipped with a gasoline motor and are designed for works without electricity and compressed air lines.

Specifications of **GMAX II 5900 HD ProConnect Optimum:**

- Motor type: gasoline (Honda)
- Motor rating: 4.1 kW
- Maximum capacity: 6.0 l/min
- Maximum working pressure: 230 bar
- Maximum permitted pressure for Bronya® application: 80 bar
- Weight: 64 kg

Specifications of **GMAX II 7900 HD ProConnect Optimum:**

- Motor type: gasoline (Honda)
- Motor rating: 4.8 kW
- Maximum capacity: 8.3 l/min
- Maximum working pressure: 230 bar
- Maximum permitted pressure for Bronya® application: 80 bar
- Weight: 67 kg

Area of autonomous spraying may be increased due to usage of a feeding box.

Devices with pneumatic motors

GRACO XTREME KING 45:1

These sprayers are powerful and easy in operation, designed for application of coatings with a high and extra high viscosity under severe conditions. Low maintenance costs. Extended operation life: rods are made according to PlasmsCoat Technology and XtremeSeal Sealings increase the operation life more than twice.

Suitable for severe conditions. A quick-connection coupling quickly and easily connects a pump rod without tools.

Specifications of **XTREME King 45:1:**

- Motor type: pneumatic NXT 6500
- Maximum input pressure: 7 bar
- Maximum capacity: 8.3 l/min
- Maximum working pressure: 313 bar
- Maximum permitted pressure for Bronya® application: 80 bar
- Weight: 117 kg

3. Recommendations for adjustment of equipment and selection of accessories

It is necessary to follow adjustment instructions for appropriate work of Graco airless sprayers. It is an important point on which integrity of Bronya® coating depends during application and further polymerization.

Ceramic microsphere is the key Bronya® component. It is represented by vacuum-processed balls from foamglass. These spheres are responsible for thermophysical properties of the coating, as well as for maintenance of thickness (significant shrinkage of the material is one of the signs of microsphere destruction).

Main recommendations:

- Before starting **ALL filters should be removed** from the device (including a gun filter, if any)! Filters are capable of retaining microsphere from Bronya® material, that's why they should be removed.
- The device should be clean and in working order. Use of extremely dirty equipment may lead to loss of efficiency at a low pressure and necessity to higher the pressure, which in its turn may cause destruction of Bronya® material.
- Bronya® should be applied at a minimum working pressure, but not higher than 80 bar. An advantageous difference of Graco sprayers is SmartControl System, which maintains working parameters (pressure, flow rate etc.) at the same level during the whole operation period.
The optimal pressure during work with Bronya® material is between 40 and 80 bar.
IMPORTANT!!! The pressure should not be over 80 bar. Otherwise it will lead to a partial or total damage of microsphere in Bronya® material.
- Use only recommended guns, tips and guards, as it also effects Bronya® material during application. Detailed recommendations on accessories are given below.
- Bronya® material has many ingredients. That is why over time the material divides into layers of fractions, the lighter microsphere comes to the top and the binder tends to sink to the bottom. As intake of material during application with an airless sprayer is from the bottom of a tank, the material should be **stirred during application AT LEAST once in 5-7 minutes**, in order homogeneous coating could be applied. **It is of particular importance when additional tanks for material simultaneously coming from several buckets are used!!!**

Recommended guns for airless sprayers:

GRACO CONTRACTOR II

One of the most lightweight and easy-to-handle airless paint sprayers. Graco® engineers achieved a 30 percent reduction of pressure on a paint sprayer trigger, which significantly decreases fatigability of a painter. The paint sprayer is equipped with a special double filter and a rotary joint. It eliminates the necessity of a frequent clean up of tips and prevents twisting of a high pressure hose.

ATTENTION!!! Remove a gun filter before application of Bronya® coating.

GRACO XTR5 and XTR7

New paint sprayers intended for application of high-viscosity materials. Equipped with special high wear-resistant spray heads and tips.

Designed for airless spraying and large-scale works. Used on units with a pneumatic motor.

ATTENTION!!! Remove a gun filter before application of Bronya® coating.

GRACO FTX

GRACO FTX Airless Sprayer is designed for final finishing and general painting when high mobility is needed. The most lightweight airless paint sprayer in Russian market. Supplied with airless paint spraying units of GRACO ULTRA MAX series. May be supplied for units of GRACO MARK V series.

2-finger and 4-finger triggers are available.

ATTENTION!!! Remove a gun filter before application of Bronya® coating.

GRACO SILVER GUN is not recommended as it hinders Bronya® application.

Recommended Graco tips and tip holders:

In order to achieve the best result the following factors should be taken into account while selecting a tip:

1. Spray width:

A spray width depends on a spray angle at a distance of 30 cm from the surface. The angle is indicated by the first digit on a tip. The correlation between a tip number and a spray angle with a spray width is as follows:

First digit on a tip	Spray angle, degrees	Spray 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, digit 5 in the picture on the left shows that a spray angle is 60 degrees; in order to determine a spray width the first digit should be multiplied by 5: $5 \times 5 = 25$ cm.

2. Tip size and maximum device capacity:

Tip size determines approximate material consumption. It is shown by the last two digits on a tip.

In this case 17 shows that the tip is 0.017 inch or 0.43 mm.

Each device type has the maximum capacity, which should be taken into account while selecting accessories.

A range of tips from x17 up to x23 is recommended for Bronya® application.

Tips recommended for Bronya® application		
119	121	
219	221	223
319	321	323
419	421	423
519	521	523
619	621	623
	721	723
819	821	

A tip size depends on a type and dimensions of area being insulated. Larger sprays and tips may be used for application on large plain areas (building facades, metal tanks, sheds etc.); small shaped areas (pipelines, flanges etc.) require less sprays and tip diameters.

3. Wear resistance and purpose of tips

Tips are distinguished not only by size and spray width, but also by wear resistance and purpose. We recommend wear-resistant tips for reasons of service life.

We recommend blue and black RAC X and RAC 5 tips.

IMPORTANT!!! Do not use tips with spargers.

Blue and orange tip guards fit RAC X and RAC 5 spray tips.

Use of grey XHD and RAC spray tips and tip guards is also possible.

More detailed specifications of spray tips and tip holders may be obtained from the manufacturer and Graco representatives.

Recommendations for application and work with a spray gun

A spray gun may be technically perfect, but if an operator fails to appropriately observe the procedure of spraying, a successful result will not be achieved. Incorrect methods of spraying may increase costs significantly. In order to maximize functions and operating parameters of a spray gun, the following steps should be taken:

- make sure that you hold a spray gun at right angle to the working area, as shown in the picture. Inclinations of a spray gun from side to side, approaching and withdrawal of a gun from the object being painted cause deviation of a considerable volume of material from the working area and its loss;
- arced movement of a gun causes irregular surface thickness. Remember moving the whole arm along the surface keeping your hand in the upright position;
- control velocity of swings to achieve the right surface thickness;
- apply material with an overlap; overlaps should not be more than 50 %. Larger overlaps require increased velocity of movements in order to achieve a homogeneous surface.

6-10 inches

Surface during spraying should be plain and wet

Working stroke of a gun

Swing
beginning

Pull
the trigger

Push
the trigger

Swing
end

CORRECT

Coating is thin
here

Coating is thick
here

INCORRECT

Correct and incorrect spraying

Big consumption of material and excess as a consequence is the material which is lost because of a miss past the surface being painted. In order to minimize losses, be careful and pull the trigger correctly. A trigger should not be pulled when a gun is not in motion. Appropriately set pressure on material being sprayed prevents spray excess; this mode reduces losses of material caused by its springing back from the object being painted (and saves surface structure integrity).

A spray gun should be held far enough from the working area, so that spray width could extend up to the necessary area. An optimal distance is usually 6-10 inches (from 15 to 25 cm) long, as shown above.