

# HIREC<sup>®</sup> 100

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High Repellent Coating

## Air Spray Gun Application



## Product Information & Application Instructions

### DISCLAIMER

HIREC, a coating for use on telecommunication antennas including radomes, prevents signal attenuation caused by snow, ice adhesion, or a water layer on the surface of the antenna. NTT-AT's warranty of this product only applies when HIREC is properly applied according to the provided instructions. If you do not have access to the instructions please contact NTT-AT at (408)392-4280. NTT-AT does not guarantee the effectiveness of this product depending on the high frequency, and the antenna's material, size, and shape.

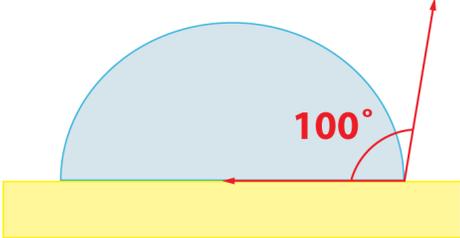
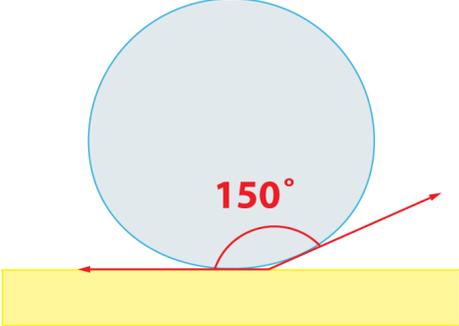
**PLEASE READ CAREFULLY BEFORE USE**

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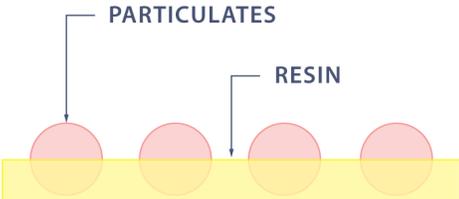
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## What is HIREC®?

HIREC is an advanced superhydrophobic coating material for the protection of high-value equipment against water-related damage. Unlike conventional water-repelling materials, water droplets do not stick to surfaces treated with HIREC; as a result, HIREC is able to provide exceptional protection against not only ice and snow, but also the gradual accumulation of water film.

Conventional Water Repellents	HIREC High Repellent Coating
	
<p>When water comes in contact with a solid surface that has been treated with conventional water repellents, the droplets spread out over the surface and typically create a contact angle of approximately 100 degrees.</p>	<p>In contrast, surfaces treated with HIREC High Repellent Coating have a water contact angle of more than 150 degrees, minimizing the area of contact between water droplets and the surface.</p>

This is achieved as a result of the unique composition of the HIREC coating material, which combines miniscule PTFE particulates and a fluorinated resin. When applied to a solid surface, the particulates and resin disperse to create a textured surface; when this surface is exposed to water, the droplets come in contact only with the raised particulates and easily roll off.

	
<p>When HIREC is applied to a surface, the PTFE particulates and resin create a textured surface.</p>	<p>Water droplets are repelled by this textured surface and easily roll off.</p>

**HIREC 100** top coat is a water-repelling material with anti-fouling properties. It is most effective in protecting against damage from water and snow, and its water-repelling performance lasts for approximately 3 years. HIREC100 contains a small amount of titanium dioxide, which serves as a photo-catalyst by ultraviolet, keeping coated surfaces like new. With the antifouling character, deterioration due to air pollution is greatly reduced. The recommended coating thickness of a top coat is 30µm and it is physically peeled off gradually 7-10µm per year by ultraviolet condition in Tokyo, so the repelling character will be maintained for approximately 3 years.

NOTE: HIREC 100 requires the application of a primer coating.

## **Before you start:**

Please make sure that the ambient temperature does not drop below 45F° while applying and drying. The recommended ambient temperature is above 68F°.

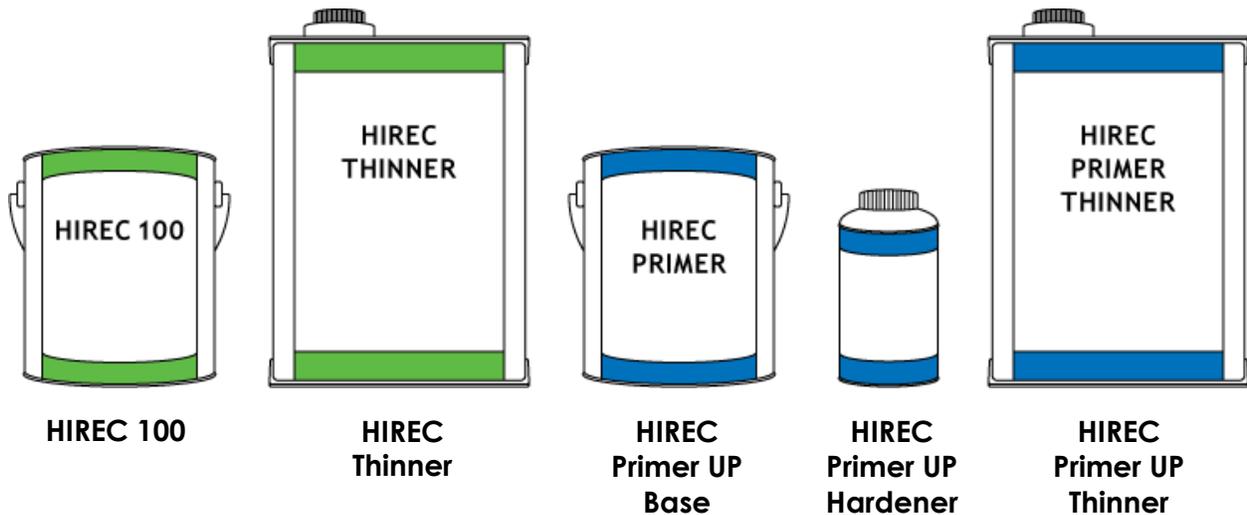
You will need:

- HIREC100, HIREC Thinner, HIREC Primer Up Base, HIREC Primer Up Hardener, and HIREC Primer Up Thinner
- Masking Materials
- Gloves, mask, and eye protection
- Cleaning alcohol
- Lint-free cloth
- 1 sheet 240 grade sandpaper
- 1 sheet 360 grade sandpaper
- Motor-driven mixer or mixing stick
- Containers for mixing HIREC in (if not using entire contents of can)
- Weigh scale (Metric system)
- Gravity feed air spray gun with cup (If using an air spray gun)
  - Nozzle Diameter: 0.059 in (1.5 mm)
  - Recommended Model: Anest Iwata: W-101-152G
  - Air Pressure: 43–71 psi (3–5kg/cm<sup>2</sup>)
- #50 wire mesh sheet ) #180 wire mesh sheet Wet Thickness Gauge
- Dry Thickness Gauge (Wet Thickness Gauge is recommended)

## DO NOT COAT HIREC WHEN THE AMBIENT TEMPERATURE DROPS BELOW 48°F (9°C)

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### HIREC 100 Materials



### Instructions for Applying HIREC100

#### STEP 1: Surface Check

##### **You will need**

- Intended coating surface
- Small amount of HIREC Primer UP Base

1. Smooth any rough surfaces on the intended surface and apply an anti-corrosive coating. The surface should be even, and free from cracks, crevices, rust, etc.
2. If you intend to apply HIREC 100 to a painted surface, apply a small amount of HIREC Primer UP Base to confirm that there is no interaction with the existing paint, such as shrinking, peeling or dissolving.

#### STEP 2: Masking

##### **You will need**

- Masking materials

1. Securely cover all other equipment and surfaces (including cords) in the vicinity of the intended surface with protective material (e.g., polyethylene sheets, masking tape, etc.)

### STEP 3: Surface Preparation

#### **You will need**

- Lint-free Cloth/ Brush for cleaning
- Cleaning alcohol
- 240 grade sandpaper
- 80 grade sandpaper (If the intended surface is very rough)

1. Wipe the surface with a Lint-free cloth dampened with paint thinner or cleaning alcohol to remove any oily substances such as machine oil, grease, etc. Wipe off any water on the surface with a Lint-free cloth. Allow the surface to completely air dry. (We do not recommend using water to clean the surface, since it takes time to completely dry.)
2. To improve adhesiveness and water-repelling performance, gently rub the surface with 240 grade sandpaper after cleaning to remove shine and deteriorated layers.
3. For FRP (Fiber-Reinforced Plastic) surfaces, use sandpaper or a power brush to remove deteriorated resin and exposed glass fibers.
4. After preparing the surface, use a brush or Lint-free cloth dampened with paint thinner or cleaning alcohol to remove any dust particles. **Do not use bare hands.**

### STEP 4: Primer Coat

#### **You will need:**

- HIREC Primer UP Base
- HIREC Primer UP Hardener
- HIREC Primer UP Thinner
- Weigh scale
- Mixing container
- Lint-free cloth (Brush for cleaning)
- Air spray gun
- Wire mesh (#180 or equivalent)
- Intended surface
- HIREC 100 Thinner

**Spreading rate: 200g/m<sup>2</sup>**

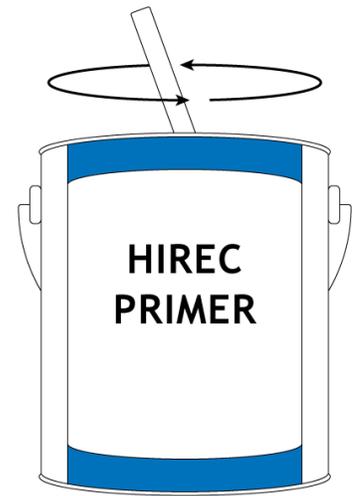
(HIREC Primer UP Base and Hardener weight before dilution with HIREC Primer Thinner)

**Wet Coat Thickness Range: 75–100 μm**

Primer coating does not last longer than half a day once the compositions are mixed

Primer Preparation

1. Open the can of HIREC Primer UP Base and stir until the contents become uniform. (The use of a motor-driven mixer is recommended especially when mixing a large amount.)
2. Add HIREC Primer UP Hardener to the HIREC Primer UP Base. See note below. Stir for approximately 5 minutes until the mixture becomes uniform and there is no sediment at the bottom of the can.



Primer Composition	Base-to-Hardener Mixing Ratio (weight %)
Standard	90:10
With Color	85:15

(Ex. HIRECPrimer UP Base-360g, HIREC Primer UP Hardener-40g)

**Note: Use a weigh scale to measure accurate amounts of each to achieve the proper mixing ratio, and immediately seal up the remaining materials. Mix according to weight ratio, not volume ratio.**

3. Add the proper amount of HIREC Primer UP Thinner between 0–25 % weight depending on the ambient temperature and painting method as indicated in the table below. Stir for approximately 2 minutes until the thinner is uniformly mixed.

**Dilution Value (% weight)**

Ambient Temperature		
50°F (10°C)	68°F (20°C)	86°F (30°C)
10~25	10~20	10~20

(ex. If value is 10%, HIREC Primer UP Base + HIREC Primer UP Hardener-400g, HIREC Primer UP Thinner-40g)

**Note: If the amount of HIREC Primer UP Thinner to mix with HIREC Primer UP Base is uncertain, start by adding about 10 % weight of HIREC Primer UP Thinner, and add more if primer coat is too thick to spray on the intended surface.**

Equipment Preparation

4. Prepare the following piece of equipment for applying the top coating::

- |                               |                                    |
|-------------------------------|------------------------------------|
| a) <b>Air Spray Gun Type:</b> | Gravity Feed Spray Gun with Cup    |
| <b>Nozzle Diameter:</b>       | 0.059 in (1.5 mm)                  |
| <b>Recommended Model:</b>     | Anest Iwata: W-101-152G            |
| <b>Air Pressure:</b>          | 43–71 psi (3–5kg/cm <sup>2</sup> ) |

### Special Care

5. Any uneven or hard-to-reach areas that may be difficult to coat with standard painting methods should be painted in advance using a spray gun or brush.

### Paint Filtration

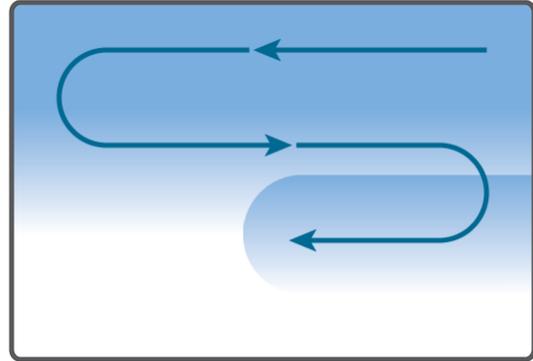
6. Filter the paint through a wire mesh (#180 or equivalent) into a paint cup or tank.

### Applying Primer

Spreading rate: 200g/m<sup>2</sup>

Wet Coat Thickness Range: 75–100 μm

7. For spray painting, position the gun **8–12 in** (20–30 cm) away from the intended surface and move at a speed of between **0.7–1.0 ft/sec** (0.2–0.3 m/sec) to achieve a uniform coating. Proper overlapping of the spray pattern is essential to achieve an even finish. While painting, aim the spray at the bottom edge of the preceding stroke so as to overlap half of the area of the previous stroke.



8. Use the wet gauge and check that the thickness is 75~100μm. It becomes 30 to 40μm thick when dried.
9. It is much more important to measure the amount of HIREC coating rather than counting the number of times the coating is applied. Spreading rate for primer coat is 200g/m<sup>2</sup>. To measure with more precision, it is recommended to use film thickness meters to be described.

### Drying

10. When the application of the Primer Coating is complete, allow the wet primer surface to dry for the approximate period of time indicated below:

Temperature	45°F (7°C)	50°F (10°C)	68°F (20°C)	86°F (30°C)
Time (Hours)	120	48	24	16

**Note: Painting when the ambient temperature is above 68°F (20°C) is recommended**

### Cleaning

11. To prevent nozzle clogging, cleanse the air spray gun and the cup thoroughly with thinner or cleaning alcohol after each use. It is recommended for spare units to be prepared in case of clogging. (Clogging is often caused when using spray guns.)

Hardness check

- To test whether the primer coating has completely hardened, apply a small amount of HIREC 100 Thinner (not HIREC UP thinner) to confirm that there is no shrinking peeling, or dissolving the primer coating.

STEP 5: Application of Top Coating

**You will need:**

- HIREC100
- HIREC100 Thinner
- HIREC100 roller
- Weigh scale
- Mixing container
- Motor-driven mixer or mixing stick/spoon
- Brush or air gun (if there are difficult-to-reach areas with roller)
- Lint-free cloth (Brush for cleaning)
- Cleaning alcohol
- Wire mesh (#50 or equivalent)
- 360 grade sand paper
- Air spray gun

**Spreading Rate: 300g/m<sup>2</sup>** (HIREC100 weight before dilution with HIREC100 thinner)  
**Dry Coat Thickness Range: 30–40 μm**  
 Top coat does not last longer than a day once the compositions are mixed

Top coat Preparation

- Open the can of HIREC 100 and stir or shake the can until the contents become uniform. (A motor-driven mixer is recommended if preparing a large amount.)
- Add HIREC 100 Thinner for dilution in accordance with the painting conditions and stir for approximately 3 minutes until the contents become uniform. Standard quantity for dilution is indicated below:

**Dilution Value (% weight)**

Ambient Temperature
45–86°F (7–30°C)
100 % weight

(ex. HIREC100-100g, HIREC100 Thinner -100g)

Equipment Preparation

- Prepare the following equipment for painting:

**Air Spray Gun Type:** Gravity Feed Spray Gun with Cup  
**Nozzle Diameter:** 0.059 in (1.5 mm)  
**Recommended Model:** Anest Iwata: W-101-152G

**Air Pressure:**43–71 psi (3–5kg/cm<sup>2</sup>)Surface Care

4. Gently rub the primer-coated surface with 360 grade sandpaper to remove shine and any deteriorated layers, then wipe the surface with cleaning alcohol.
5. Any uneven or hard-to-reach areas that may be difficult to coat with standard painting methods should be painted in advance using a spray gun.

Paint Filtration

6. Filter the paint through a wire mesh (#50 or equivalent) into a paint cup or tank.

Applying Top Coat

Paint with the air spray gun as follows.

Spreading Rate: 300 g/m<sup>2</sup>

**Caution: This procedure is imperative for proper application of HIREC 100. Please be sure to follow the directions exactly.**

7. Position the gun **8–12 in** (20–30 cm) away from the intended surface and move at a speed of between **0.7–1.0 ft/sec** (0.2–0.3 m/sec) to achieve a uniform coating. Proper overlapping of the spray pattern is essential to achieve an even finish. While painting, aim the spray at the bottom edge of the preceding stroke so as to overlap half of the area of the previous stroke.
8. Allow the first coat to dry until the shine is gone and the solution has volatilized.
9. Rotate the surface 90 degrees and apply another coat. Let the surface dry until the solvents have evaporated, and the surface is no longer shiny. The paint changes appearance from white to slightly transparent in about three to ten minutes.

Repeat this process 4~5 times (A number of times provided is just an example. An amount of HIREC is more important described below). The coating thickness after drying should be 30–40 µm.

10. During applying top coat, stir up HIREC100 in an air spray gun cup every 5~10 minute in order to prevent HIREC fluorine powder to be deposited at the bottom of a cup. Also stir up HIREC100 in a mixing container before transferring to an air spray gun cup.
11. It is much more important to measure the amount of HIREC coating rather than counting the number of times the coating is applied. Spreading rate for top coat is 300g/m<sup>2</sup>. To measure with more precision, it is recommended to use film thickness meters to be described.

Check and Touch-up

12. Inspect the dry painted surface to confirm that it is smooth and uniformly painted. There should be no shine and water should not adhere to the painted surface.

13. If the painted surface is not even or there are missed areas, scratches, etc., apply additional paint to the areas in need of reapplication. In the case a deep scratch down below the Primer coating, reapply Primer coating to the affected area as needed and allow to dry before reapplying the top coating.
14. After applying the top coating, allow the painted surface to dry sufficiently until the smell of thinner can no longer be detected.

#### Cleaning

15. To prevent nozzle clogging, cleanse the air spray gun and the cup thoroughly with thinner or cleaning alcohol after each use. It is recommended for spare units to be prepared in case of clogging. (Clogging is often caused when using spray guns.)

#### Drying

16. Allow sufficient time for the surface to dry and hardens (12 hours or more) before handling or packaging.
17. Water-repelling performance will be diminished if the painted surface is disturbed before completely dry. Take precautions when handling or packaging.

**Note: Wet surfaces coated with HIREC 100 are very slippery. Do not place any objects on HIREC 100 coated surfaces.**

**For Application and Sales Assistance, please contact:**

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# Targeted State Checking Criteria (HIREC100)

--Use this sheet with the instructions--

## STEP 1: Surface Preparation

- No defects, such as rust, expansion or cracks, on the targeted surface. Any holes, bumps, and laitance are treated.
- No potential damage by interaction with the existing coat on the targeted surface.

## STEP 2: Masking

- The proper area is masked adequately.

## STEP 3: Surface Treatment

- No oil or water is observed on the targeted surface.
- Shine is eliminated from the surface by sandpaper.
- There are no kinds of particles (dust, glass fiber, and etc.) causing bumps on the surface. Make sure no dust from sanding is present.

## STEP 4: Application of Primer Coating

### Paint Preparation

- The painting material is as directed in the instructions.
- No lumps at the bottom of the can. Contents are mixed thoroughly
- Ratio of the mixing paints are exactly as directed, and combined contents are mixed thoroughly
- Only use HIREC dedicated thinner.
- Viscosity of paint is adjusted by the amount of thinner depending on painting environment.

### Equipment Preparation

- Equipment is appropriate and in good working order.

### Special Care

- Parts where normal coating is difficult should be painted in advance

### Filtering

- No foreign objects or coagulation are in the filtered paint.

### Painting

- No paint drips, thin spot, or unpainted areas.

### Drying

- Secure enough time as directed on the instructions to dry

### Hardness Check

- Take extra care in checking if the surface is completely dry

## STEP 5: Application of Top Coating

### Paint Preparation

- The painting material is as directed in the instructions.
- No lumps at the bottom of the can. Contents are mixed thoroughly
- Ratio of the mixing paints are exactly as directed, and combined contents are mixed thoroughly
- Only use HIREC dedicated thinner.
- Viscosity of paint is adjusted by the amount of thinner depending on painting environment.

### Equipment Preparation

- Equipment is appropriate and in good working order.

### Surface Care

- Be careful not to expose the substrate

### Special Care

- Parts, where normal coating is difficult should be painted in advance.

### Filtering

- No foreign objects or coagulation are in the filtered paint.

### Painting

- No paint drips, poorly painted, or unpainted areas.
- Brush stroke line should only be up and down direction

### Check and Touch-up

- Imperfections are treated and fixed
- When sprayed with water, it does not adhere to the painted surface.

### Drying

- Secure enough time as directed in the manual to dry.
- Do not touch the coated surface.