Black Magic Liquid Emulsion
The Complete Photographic Emulsion System
Technical Data Sheet

Black Magic Normal Contrast Emulsion:
Item #6000 500ml bottle
A general purpose silver bromide emulsion about grade 2-3 in contrast. One 500ml bottle coats up to 8 square meters (86 sq. ft). The yield depends on the surface to be coated. Open and use under safelight conditions only. Red safelight recommended. Store emulsion in refrigerator.

Black Magic High Contrast Emulsion:
Item #6100 500ml bottle
A general purpose silver bromide emulsion about grade 3-4 in contrast. One 500ml bottle coats up to 8 square meters (86 sq. ft). The yield depends on the surface to be coated. Open and use under safelight conditions only. Red safelight recommended. Store emulsion in refrigerator.

Black Magic Variable Contrast Emulsion:
Item #6150 500ml bottle
A chlorobromide variable contrast emulsion ranging from grade 0-4+ in contrast. One 500ml bottle coats up to 8 square meters (86 sq. ft). The yield depends on the surface to be coated. Open and use under safelight conditions only. Red safelight recommended. Store emulsion in refrigerator.

Black Magic Hardener:
(Formaldehyde free)
Item #6250 500ml bottle
Hardener is used to help emulsion to adhere to all surfaces and is especially effective for use when coating on hard surfaces such as glass, plastic or hard stone. Hardener may be added to the Gelatine, Emulsion or to the developer.
** Black Magic Hardener is very acidic with a PH value of 3. Avoid direct contact of hardener with (alkaline) developer concentrates. Also, avoid contact with other acids like vinegar or citric acid. Keep out of reach of children. After direct contact with skin or eyes, flush thoroughly with water. If swallowed, induce vomiting immediately and seek medical assistance. Material Safety Data Sheets are available.

Black Magic Photo Gelatine:
Item #6350 250 grams
Use Gelatine as a separation layer for metallic surfaces. Saves on emulsion by limiting the emulsion’s absorption into certain materials.

General Information
Use Cachet Black Magic Liquid Emulsion to coat any type of object, including paper, glass, fabrics, wood, metals, rocks, eggs and anything else your imagination desires.

Storage / Shelf life:
Emulsion should be stored in the refrigerator at 42°F to 46°F. The shelf life unopened and stored properly is one year. Freezing will substantially extend shelf life of emulsion. Allow the emulsion to come to ambient temperature before heating for application. Item 6250, Liquid Hardener has a shelf life after opened of six months. When used as an additive for the developer, this product has a shelf life according to the data of the developer. Prepare only as much working solution as you require.

Safelight recommendation:
For item 6000 & 6100 normal and high contrast emulsion, use red or yellow/green. For item 6150 variable contrast emulsion, use a RED safelight. See "Rod Dresser’s Safelight Test" in Cachet’s Technical Guide.

Packaging note:
Black Magic is packaged in wide mouth bottles. This allows you to use a plastic spoon to remove emulsion as needed. Continuous heating and cooling reduces the shelf life of the product. Always use plastic or glass utensils. The emulsion when it contacts with metals may become contaminated.

Instructions for using Black Magic
1. Prepare the Object for Coating
Thoroughly clean the surface to be coated. It must be completely free of any kind of dirt or oils for the emulsion to adhere properly. To avoid contaminating the surface with skin oils, use latex gloves.

A. Paper or fabric materials can be coated directly with emulsion or pre-coated with gelatine (item 6350). Pre-coating will increase the gloss of the final image as well as conserving emulsion, as it will not absorb into the fabric.

B. Smooth or hard surfaces such as glass or polished stone coat best when they are sanded or roughed up before coating. It is highly recommended to use hardener either in the gelatine, emulsion or developer to help adhesion of the emulsion.
C. Metallic surfaces must be pre-coated with gelatine, oil-based polyurethane paint or alkyd resin primer so that the emulsion does not contact the metal. Hardener is highly recommended!

2. Preparing Emulsion for coating
Take the original bottle and heat it until the emulsion liquefies. Use a bucket with warm water at 100° to 125°F. When liquefying smaller amounts of emulsion, spoon out the desired amount of emulsion in the darkroom under red safelight. (Use glass or plastic utensils, no metal!) Heat the emulsion until it liquefies. Remember, if you are going to take the cap off the liquid emulsion bottle, it must be done under safelight (red) conditions. Optimum coating temperature is between 100° & 110° F.

3. Coating your object
Use the liquefied emulsion to coat your object. It is recommended for best results to apply two coats of emulsion. After applying the first coat, let the emulsion set up, but not completely dry. Then apply a second coat. This will give a deeper black and better contrast. Apply the emulsion using one of the following methods.

A. Dip & dunk. This method works well with small three-dimensional objects like eggs.
B. Paint the emulsion on with a brush. Popular brushes include camel hair, sponge and fine synthetic paint brushes. (The only real precaution is using a brush with a metal fitting to hold the bristles.) Dip the brush into the emulsion and paint onto the object. Alternatively, pour the emulsion onto object and spread with brush. Pouring emulsion onto absorbent materials can cause uneven coating.
C. Use a puddle pusher to apply emulsion.
D. Spray the emulsion using an airbrush. Diluting with distilled water can control the viscosity of the emulsion, 1:1 is a good starting point. Spray several layers to build up the emulsion and assure best results. Be sure to wear proper safety mask and goggles to protect you from airborne particles.

4. Coat “Test Strips”
Test strips should be coated each time you apply emulsion for determining the correct exposure. The back of old photo paper works very well; however, it is best to coat test strips of the same material. For example, if you are coating tiles, your test strips should be made on tiles.

5. Dry the coated object.
Let the coated objects sit to dry (in complete darkness) for one or two days in a cool environment or you may use a hair dryer to speed up the drying. Use on the “COLD” setting or lowest temperature setting. It is important for the emulsion to be completely dry before exposing! Be careful using a hair dryer, some dryers have a glowing element that can fog the emulsion.

6. Expose your Coated object
You have coated and dried your object and now it is time to make some prints. Treat your coated object just like black & white photographic paper. Expose (& process) a test strip to determine the correct exposure and contrast. When using items 6000 & 6100 (normal & high contrast) there is no need to use filters. When exposing item 6150 Variable Contrast emulsion you can adjust the contrast by using VC filters, adjusting your color head or with a VC cold light. Once you have determined the correct exposure, expose your object. (When exposing three-dimensional objects, use a small F-stop to increase the depth of field.)

7. Process your exposed object.
The material you have coated will determine processing. Use the following as a starting point and reference.

<table>
<thead>
<tr>
<th>Step</th>
<th>Time</th>
<th>Chemistry / Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer</td>
<td>3 minutes for optimum results</td>
<td>Cachet LP-Brom 3 diluted 1:7 or any high-energy developer. You can add hardener to help adhesion of emulsion</td>
</tr>
<tr>
<td>Stop</td>
<td>30 seconds</td>
<td>2% acidic solution</td>
</tr>
<tr>
<td>Fix</td>
<td>1-5 minutes</td>
<td>Both hypo fixer and rapid fixer work well. Do not use fixer with hardener.</td>
</tr>
<tr>
<td>Wash</td>
<td>5-45 minutes depending on material coated</td>
<td>Hard surfaces (plastic, metal, etc.) 5 minutes. Absorbent surfaces (paper, fabric, etc.) 30-45 minutes</td>
</tr>
<tr>
<td>Toning</td>
<td>Follow toner’s instruction sheet.</td>
<td>Black magic tones exceptionally well with selenium, sepia, gold or azure blue.</td>
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<tr>
<td>Dry</td>
<td>Air dry most objects or you can use forced air (warm).</td>
<td>Black Magic liquid emulsion is very delicate when wet. Use extra care to not damage or scratch the print. Since the emulsion is hand coated it will be thicker than normal black &amp; white papers. It is important to give full development and to handle the coated object with extra care. If emulsion is lifting off when wet, use hardener in the developer.</td>
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Mixing Photo Gelatine
This step can be done under normal lighting conditions. Heat up 1000cc of water to 125° - 150° F and dissolve 40 grams of gelatine by continuously stirring until all the lumps are gone. Coat your object directly afterwards. Let the gelatine completely dry before coating emulsion onto your object. To improve hardening of the emulsion, add 20-50cc of Black Magic hardener to your solution. You can harden indirectly by adding hardener to the gelatine and harden directly by adding hardener to the emulsion. For better adhesion of the coating and to improve mechanical resistance, you may combine both methods. Furthermore, you can add hardener directly to the developer.
Using Black Magic Hardener

Black Magic liquid hardener is used to increase the mechanical resistance and the adhesion characteristics of the emulsion. There are three methods of using the hardener. You can use any one of the three or all together in any combination. Hardener is recommended for all materials.

A. **Add to the developer.** Mix the hardener concentrate 1:20 with the working solution of developer. This is the preferred and easiest way to harden the emulsion.

B. **Add to the emulsion.** First, make a stock solution of hardener by mixing the concentrate 1:20 with distilled water. Second, add the stock solution 1:20 into the emulsion. Prepare only as much emulsion as you require as you can not re-use emulsion in which hardener has been added.

C. **Add to the Gelatine.** Using the stock solution of hardener, mix 1:20 into the gelatine. This is highly recommended when coating onto any hard surface.

**Helpful hints & things to remember**

1. Open & coat the emulsion under safelight only! (RED)
2. Store coated objects in complete darkness to dry. If you are using watercolor paper, you can use the packaging from old black & white paper.
3. Make sure emulsion is completely dry before exposing.
4. Use hardener for smooth and hard surfaces.
5. Hardener is not necessary for watercolor papers although it is wise to add it to the developer.
6. Two thin coats of emulsion are better than one thick coat. If the emulsion is coated too thick, it may have a yellowish cast.
7. You can mix the normal and hard emulsions in any ratio to get in-between contrast grades. Better than that you can use **variable contrast** emulsion for any contrast from 0-5.
8. Black Magic liquid emulsion is completely archival. The emulsion will be as archival as the object you choose to coat.
9. Do not use metal utensils or beakers, the metal will react with the silver in the emulsion and may cause contamination.
10. All materials must be clean. Any trace of Dust or grease will lead to adhesion problems.