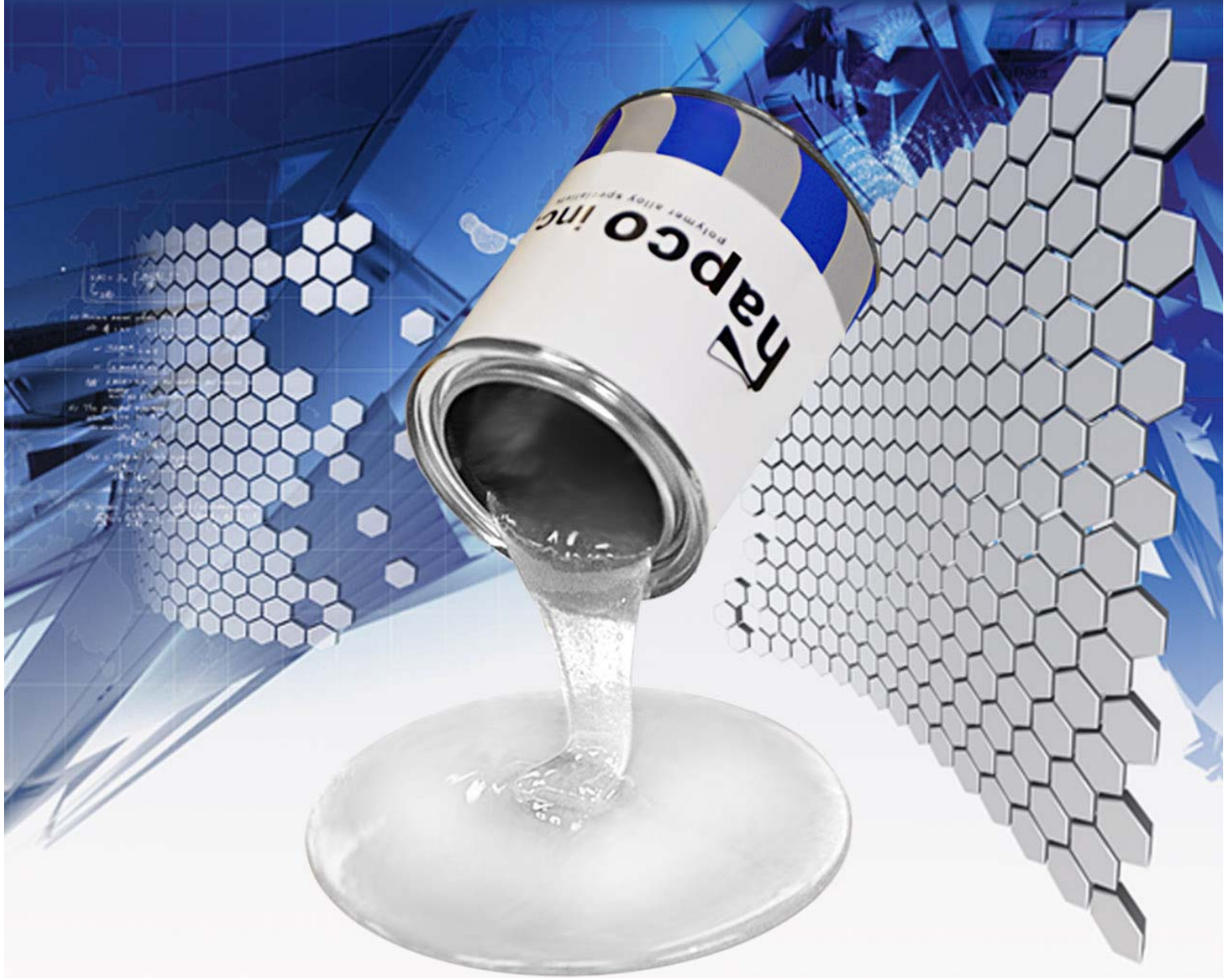


ULTRALLOY

by **hapco** inc.



**ALL PURPOSE
LIQUID MOLDING COMPOUNDS**

ULTRALLOY

LIQUID MOLDING COMPOUNDS

The **ULTRALLOY series** of liquid molding compounds are tough, fast cycling, low cost, and easy to use. **ULTRALLOY** is designed to be used with Liquid Molding, open casting, pressure casting, or vacuum casting processes. **ULTRALLOY** can be used with silicone, epoxy, urethane, polyester, or aluminum molds. Low cost molds and fast cycle times are two key attributes of **ULTRALLOY**.

ULTRALLOY is available in several series. Each series has different products with different physical properties. Properties such as elongation, tensile strength, and modulus of elasticity can be selected to mold parts with the correct physical characteristics. Choose the **ULTRALLOY** material with the exact properties you need, or that are required to meet specifications.

ULTRALLOY is available in opaque white, clear/transparent, and in fire retardant (UL 94V-0) versions. Custom coloring can be achieved by pigmenting **ULTRALLOY** with Hapco's easy to mix color dispersions. Both opaque and translucent color dispersions are available.

ULTRALLOY can be molded in inexpensive molds, reducing total part cost, for short run programs.

ULTRALLOY is made for prototypes and short runs of plastic parts. **ULTRALLOY** fills the need for low cost, high performance parts, in volumes less than 10,000 parts per year.

KEY ADVANTAGES:

- **Fast-Turnover**
- **Low Viscosity**
- **Tough**
- **Easy to use**
- **Flame Retardant**
- **Low Cost Tooling**
- **Reliable**

ULTRALLOY

~ SERIES OVERVIEW ~



ULTRALLOY 100 SERIES - Page 4

A series of general purpose Liquid Molding Compounds. This product turns a natural white but is available pigmented white for extra brightness. Both versions are available in an 8.5 minute or 25 minute gel time.



ULTRALLOY 200 SERIES - Page 5

A series of general purpose Liquid Molding Compounds that do not change color and remain clear/light yellow when cured. Ultralloy 200 Series are ideal for in mold coloring of parts. They can be easily pigmented and the color remains the same in the cured or liquid state.



ULTRALLOY 300 SERIES - Page 6

A series of clear, flame retardant (UL94 V-O), Liquid Molding Compounds. These products have a hardness of 85D and are fairly stiff with a flexural strength of over 13,000 psi. These materials are easily pigmented and available in gel times ranging from 8.5 to 60 minutes.



ULTRALLOY 3300 SERIES - Page 7

A series of flame retardant, (UL 94V-0) high strength, systems with excellent physical properties. Underwriter Labs Flame Retardant 94V-0 @ 2.5 mm thickness. This series is available in a 2, 4, 14, and 28 minute gel time.

ULTRALLOY 100 SERIES

A series of general purpose Liquid Molding Compounds. This product turns a natural white but is available pigmented white for extra brightness. Both versions are available in an 8.5 minute or 25 minute gel time.

- General purpose
- 1:1 by weight
- Available in 2 speeds

	PHYSICAL PROPERTIES	TEST METHOD	108	108 White	109	109 White
PHYSICAL PROPERTIES	Mix Ratio by volume A:B by weight A:B	Calculation	100:120 100:100	100:120 100:100	100:120 100:100	100:120 100:100
	Gel time 100 grams @ 25°C	ASTM D-2971	25 min.	25 min.	8.5 min.	8.5 min.
	Color (cured)	Visual	natural white	pigmented white	natural white	pigmented white
	Hardness Shore	ASTM D-2240	80 D	80 D	80 D	80 D
	Viscosity mixed @ 25°C cps	ASTM D-4878	300 ±50	300 ±50	300 ±50	300 ±50
	Specific Gravity mixed @ 25°C	ASTM D-4669	1.10	1.10	1.10	1.10
	Shrinkage inch/inch See shrinkage paragraph	ASTM D-2566	.001-.003	.001-.003	.001-.004	.001-.004
	Demold time @ 70°F 1/8" thick	HAPCO TEST	4-6 hrs.	4-6 hrs.	45-90 min.	45-90 min.
	Weight per cubic inch (lbs.)	Calculation	0.0397	0.0397	0.0397	0.0397
PRODUCT PROPERTIES	Tensile Strength (psi)	ASTM D-638	7,700	7,700	7,700	7,700
	Elongation %	ASTM D-638	8.6	8.6	8.6	8.6
	Modulus of Elasticity psi (000)	ASTM D-638	145	145	145	145
	Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	0.81 8.93	0.81 8.93	0.81 8.93	0.81 8.93
	Heat Distortion Temperature (°C)	ASTM D-648	70°C	70°C	70°C	70°C
	Flexural Strength (psi)	ASTM D-790	11,900	11,900	11,900	11,900
	Flexural Modulus psi (000)	ASTM D-790	314	314	314	314

NOTE: Before use, reference material handling, processing, and safety notes located at the end of this brochure.

ULTRALLOY 200 SERIES

A series of general purpose Liquid Molding Compounds that do not change color and remain clear/light yellow when cured. Ultralloy 200 Series are ideal for in mold coloring of parts. They can be easily pigmented and the color remains the same in the cured or liquid state. Tensile strengths from 10,300 psi to 11,800 psi are available.

- 1:1 by weight
- Each available in 2 speeds
- Clear/translucent when cured,

	PHYSICAL PROPERTIES	TEST METHOD	202	203	206	207
PHYSICAL PROPERTIES	Mix Ratio by volume A:B by weight A:B	Calculation	100:115 100:100	100:115 100:100	100:115 100:100	100:115 100:100
	Gel time 100 grams @ 25°C	ASTM D-2971	25 min.	8.5 min.	25 min.	8.5 min.
	Color (cured)	Visual	clear / slight yellow	clear / slight yellow	clear / slight yellow	clear / slight yellow
	Hardness Shore	ASTM D-2240	86 D	86 D	86 D	86 D
	Viscosity mixed @ 25°C cps	ASTM D-4878	300 ±50	300 ±50	275 ±50	275 ±50
	Specific Gravity mixed @ 25°C	ASTM D-4669	1.10	1.10	1.10	1.10
	Shrinkage inch/inch See shrinkage paragraph	ASTM D-2566	.001-.003	.001-.004	.001-.003	.001-.004
	Demold time @ 70°F 1/8" thick	HAPCO TEST	4-6 hrs.	45-90 min.	4-6 hrs.	45-90 min.
	Weight per cubic inch (lbs.)	Calculation	0.0397	0.0397	0.0397	0.0397
PRODUCT PROPERTIES	Tensile Strength (psi)	ASTM D-638	11,800	11,800	10,300	10,300
	Elongation %	ASTM D-638	6.3	6.3	8.3	8.3
	Modulus of Elasticity psi (000)	ASTM D-638	261	261	256	256
	Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	0.56 4.37	0.56 4.37	0.78 6.42	0.78 6.42
	Heat Distortion Temperature (°C)	ASTM D-648	80°C	80°C	73°C	73°C
	Flexural Strength (psi)	ASTM D-790	15,800	15,800	11,900	11,900
	Flexural Modulus psi (000)	ASTM D-790	424	424	320	320

NOTE: Before use, reference material handling, processing, and safety notes located at the end of this brochure.

ULTRALLOY 300 SERIES

A series of clear, flame retardant (UL94 V-O), Liquid Molding Compounds. This series has an ultimate hardness of 85D and tensile strengths from 8,900 psi to 10,600 psi are available.

- ♦ Flame retardant, meets UL 94V-0
- ♦ Clear/ translucent when cured.
- ♦ 1:1 by weight

	PHYSICAL PROPERTIES	TEST METHOD	304	304-60	306	307
PHYSICAL PROPERTIES	Mix Ratio by volume A:B by weight A:B	Calculation	100:107 100:100	100:107 100:100	100:107 100:100	100:107 100:100
	Gel time 100 grams @ 25°C	ASTM D-2971	25 min.	60 min.	25 min.	8.5 min.
	Color (cured)	Visual	clear / hazy	clear / hazy	clear / hazy	clear / hazy
	Hardness Shore	ASTM D-2240	85 D	85 D	85 D	85 D
	Viscosity mixed @ 25°C cps	ASTM D-4878	300 ±50	300 ±50	275 ±50	275 ±50
	Specific Gravity mixed @ 25°C	ASTM D-4669	1.10	1.10	1.10	1.10
	Shrinkage inch/inch See shrinkage paragraph	ASTM D-2566	.001-.003	.001-.004	.001-.003	.001-.004
	Demold time @ 70°F 1/8" thick	HAPCO TEST	5-8 hrs.	16-24 hrs.	5-8 hrs.	2-4 hrs.
	Weight per cubic inch (lbs.)	Calculation	0.0397	0.0397	0.0397	0.0397
PRODUCT PROPERTIES	Tensile Strength (psi)	ASTM D-638	10,600	10,600	8,900	8,900
	Elongation %	ASTM D-638	9.0	9.0	14.4	14.4
	Modulus of Elasticity psi (000)	ASTM D-638	224	224	197	197
	Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	0.57 8.99	0.57 8.99	0.66 9.40	0.66 9.40
	Heat Distortion Temperature (°C)	ASTM D-648	65°C	65°C	60°C	60°C
	Flexural Strength (psi)	ASTM D-790	13,900	13,900	13,200	13,200
	Flexural Modulus psi (000)	ASTM D-790	365	365	352	352
	Flame Rating	94V	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0

NOTE: Before use, reference material handling, processing, and safety notes located at the end of this brochure.

ULTRALLOY 3300 SERIES

A series of flame retardant, (UL 94V-0) high strength, systems with excellent physical properties. A series of flame retardant Liquid Molding Compounds with high physical properties. The tensile strength is 12,600 psi and flexural strength is 16,500 psi after post cure. This series is available in a 2, 4, 14, and 28 minute gel time.

- Flame retardant, meets UL 94V-0
- 1:1 by volume
- Available in 4 speeds
- High physical properties

		TEST METHOD	3310	3310-28	3311	3312
PHYSICAL PROPERTIES	Mix Ratio by volume A:B by weight A:B	Calculation	100:100 100:95	100:100 100:95	100:100 100:95	100:100 100:95
	Gel time 100 grams @ 25°C	ASTM D-2971	14 min.	28 min.	4 min.	2 min.
	Color (cured)	Visual	Amber / translucent	Amber / translucent	Amber / translucent	Amber / translucent
	Hardness Shore	ASTM D-2240	85 D	85 D	85 D	85 D
	Viscosity mixed @ 25°C cps	ASTM D-4878	400 ±100	400 ±100	400 ±100	400 ±100
	Specific Gravity mixed @ 25°C	ASTM D-4669	1.20	1.20	1.20	1.20
	Shrinkage inch/inch See shrinkage paragraph	ASTM D-2566	.0011-.003	.0011-.003	.0011-.004	.0011-.004
	Demold time @ 70°F 1/8" thick	HAPCO TEST	6-12 hours	6-12 hours	2-4 hours	45-90 minutes
	Weight per cubic inch (lbs.)	Calculation	0.0433	0.0433	0.0433	0.0433
PRODUCT PROPERTIES	Tensile Strength (psi)	ASTM D-638	12,600	12,600	12,600	12,600
	Elongation %	ASTM D-638	7.7	7.7	7.7	7.7
	Modulus of Elasticity psi (000)	ASTM D-638	461	461	461	461
	Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	0.51 2.20	0.51 2.20	0.51 2.20	0.51 2.20
	Heat Distortion Temperature (°C) 66 psi 264 psi	ASTM D-648	86°C 78°C	86°C 78°C	86°C 78°C	86°C 78°C
	Flexural Strength (psi)	ASTM D-790	16,500	16,500	16,500	16,500
	Flexural Modulus psi (000)	ASTM D-790	315	315	315	315
	Flame Rating	94V	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0

NOTE: Before use, reference material handling, processing, and safety notes located at the end of this brochure.

PD COLOR DISPERSION SERIES

OPAQUE COLOR DISPERSIONS



**PD-6 M
RED**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-15 M
ORANGE**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-3 M
YELLOW**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-25 M
YELLOW**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-4 M
GREEN**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-9 M
BROWN**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-1 M
DARK BLUE**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-26 M
BLUE**

0.03 (3%) by weight
in Ultralloy 206/207



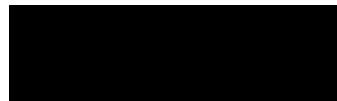
**PD-8 M
LIGHT GREY**

0.03 (3%) by weight
in Ultralloy 206/207



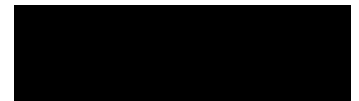
**PD-11 M
DARK GREY**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-2 M
CARBON BLACK**

0.02 (2%) by weight
in Ultralloy 206/207



**PD-512 M
BLACK OXIDE**

0.02 (2%) by weight
in Ultralloy 206/207



**PD-7 M
WHITE**

0.05 (5%) by weight
in Ultralloy 206/207

PD - Mix Ratio: Add 1 - 5% (0.01-0.05) by weight to Part B, mix well. In above results, ratios were added by weight to Ultralloy 206/207 Part B, then mixed and cured.

Color Dispersions are compatible with most Hapco Resin Systems except those listed under the MP Color Series. Read product list for MP Color Series. All of Hapco Color Dispersions are appropriate for standard and/or FDG materials.

Weigh the color additions accurately for batch to batch uniformity. The above colors may be blended to form additional colors.

NOTES:

All above Ratios are % added by weight to **Ultralloy 206/207 Part B**, then mixed and cured.

Packaging Available: 1/2 pint cans, 1 quart cans, 1 gallon pails, and 5 gallon pails.

TD COLOR DISPERSION SERIES

* TRANSLUCENT COLOR DISPERSIONS



**TD-22 M
RED**
0.005 (1/2%) by weight
in Ultralloy 206/207



**TD-24 M
YELLOW**
0.005 (1/2%) by weight
in Ultralloy 206/207



**TD 20 M
VIOLET**
0.005(1/2%) by weight
in Ultralloy 206/207



**TD-21 M
ORANGE**
0.005 (1/2%) by weight
in Ultralloy 206/207



**TD-23 M
BLUE**
0.005 (1/2%) by weight
in Ultralloy 206/207



**TD-28 M
BLACK**
0.005 (1/2%) by weight
in Ultralloy 206/207

TD - Mix Ratio: Add 1/10 - 2% (0.001-0.02) by weight to Part B, mix well. In above results, ratios were added by weight to Ultralloy 206/207 Part B, then mixed and cured. Less than 1/10% (0.001) by weight may be added to the Part B for very translucent colors, 1/2% (0.005) to 2% (0.02) may be added to Part B to form opaque colors.

Color Dispersions are compatible with most Hapco Resin Systems except those listed under MP Color Series. Read product list for MP Color Series. All of Hapco Color Dispersions are appropriate for standard and/or FDG materials.

Weigh the color additions accurately for batch to batch uniformity. The above colors may be blended to form additional colors.

NOTES:

All above Ratios are % added by weight to **Ultralloy 206/207 Part B**, then mixed and cured.

Packaging Available: 1/2 pint cans, 1 quart cans, 1 gallon pails, and 5 gallon pails.

*Translucent color dispersions are not translucent in some Liquid Molding Systems. Consult your Hapco Representative for more details.

MP COLOR DISPERSION SERIES

TRANSLUCENT* and OPAQUE COLOR DISPERSIONS for

- Hapflex 1021, 1036, 1036-5, 1056, 1056-5
- Steralloy 2021, 2021-5, 2036, 2036-5, 2056, 2056-5
- Di-Pak 4021, 4036, 4036-5, 4056, 4056-5



**TD-22 MP
RED**

0.005 (1/2%) by weight
in Ultralloy 206/207



**TD-24 MP
YELLOW**

0.005 (1/2%) by weight
in Ultralloy 206/207



**TD-23 MP
BLUE**

0.005 (1/2%) by weight
in Ultralloy 206/207



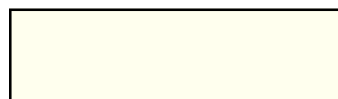
**TD-21 MP
ORANGE**

0.005 (1/2%) by weight
in Ultralloy 206/207



**PD-3 MP (Opaque)
YELLOW**

0.03 (3%) by weight
in Ultralloy 206/207



**PD-7 MP (Opaque)
WHITE**

0.05 (5%) by weight
in Ultralloy 206/207



**PD-2 MP (Opaque)
BLACK**

0.02 (2%) by weight
in Ultralloy 206/207



**TD-28 MP
BLACK**

0.005 (1/2%) by weight
in Ultralloy 206/207

TD - Mix Ratio: Add 0.005 - 0.05% by weight to Part B, mix well.

Less than 1/10% or less than 0.001 by weight can be added to the Part B for very translucent colors, 1/2% (0.005) - 2% (0.02) may be added to the Part B, by weight, for opaque coloring.

PD - Mix Ratio: Add 1—5% (0.01-0.05) by weight to Part B, mix well.

Weigh the color additions accurately for batch to batch uniformity. The above colors may be blended to form additional colors.

NOTES:

All above Ratios are % added by weight to **Ultralloy 206/207 Part B**, then mixed and cured.

Packaging Available: 1/2 pint cans, 1 quart cans, 1 gallon pails, and 5 gallon pails.

*Translucent color dispersions are not translucent in some Liquid Molding Systems. Consult your Hapco Representative for more details.

ULTRALLOY SERIES

MATERIAL HANDLING, PROCESSING & SAFETY NOTES

POSTCURE:

For maximum HDT and maximum physical properties, products should be post cured immediately after initial cure, 80°C for 8-24 hours for rigid materials and 60-65°C for 8-24 hours for flexible materials. Some post cure conditions may vary from above for certain materials. Contact Hapco for specific recommendations.

DEMOLD & CURE TIMES:

Demold and final cure time can be accelerated with the addition of postcure heat 100-175°F (38-79°C). To retain working life, heat the mold not the material for best results. Increasing the mold temperature to 80-100°F (26-38°C) will accelerate demold and cure times by up to 50%. For full cure polymers require at least 7-10 days. Final cure for faster gel materials (3-6 minute gel) is 3-7 days. Please be aware that size and mass effect demold and cure times. The customer and geometry will ultimately determine demold time.

HARDNESS NOTE:

The hardness progresses more slowly in the longer working life systems. The hardness progression can be accelerated by using the faster version or by curing with mild heat. Hardness and cure progress will be retarded, slowed down, when the temperature falls below 70°F.

SURFACE PREPARATION TO PREVENT ADHESION:

To prevent adhesion to the mold, use a GREASE-IT release agent. The following are recommended: GREASE-IT II, GREASE-IT IV, GREASE-IT V, GREASE-IT WAX P, or GREASE-IT WAX LT, use GREASE-IT FDG when a Food & Drug grade release is required. For best results, apply in a few thin coats, drying between coats. Porous surfaces, i.e. wood, plaster, etc, must be sealed thoroughly before release is applied. Use multiple coats of a good coating, such as: a high grade lacquer or urethane lacquer.

SURFACE PREPARATION FOR ADHESION:

For applications where adhesion is desired, the surface must be cleaned, abraded and dried. Sandblasting and mechanical roughing are the preferred ways of abrading surfaces to be bonded. For added adhesion to metals, use Primer 200 and for added adhesion to plastic, use Primer 810. Make sure all surfaces are clean, dry, and free from moisture.

COLD TEMPERATURES:

CAUTION - COLD TEMPERATURES - Part A may freeze or crystallize in cold temperatures. Part A may appear to be striated, thicken, or solidify. This situation can easily be corrected. Place the cover on the Part A loosely (do not seal) and place in an oven set at 170-180°F (77-83°C) for 3-6 hours and for drums heat for 6-12 hours. Reseal, allow to cool and then mix thoroughly.

MIXING:

IMPORTANT: *Before each use, mix Part B thoroughly, when pigmented, before proportioning out the required amount.*

Components may separate and should be mixed before each use. Mix, only when ready to use, by adding the curing agent to the resin portion and blending together thoroughly. Be sure to scrape and stir in all material sticking to the sides and bottom of the mixing container. Do not use paper containers or wooden mixing sticks. They may contain moisture. For best results, use plastic or coated containers, and metal or plastic sticks.

MACHINE MIXING AND DISPENSING:

Use HAPCO'S **RAPIDFIL**, **MINIFIL**, and/or **RAPIDSHOT** Dispensing Equipment for fast, reliable, and efficient dispensing.

CASTING:

Pour in a thin unbroken stream into the lowest point in the cavity or mold. This will help break up some of the air entrapped during mixing.

ULTRALLOY SERIES

MATERIAL HANDLING & SAFETY NOTES (cont.)

CASTING:

Pour in a thin unbroken stream into the lowest point in the cavity or mold. This will help break up some of the air entrapped during mixing.

SHRINKAGE:

Shrinkage or dimensional variation is largely influenced by 5 factors:

1. Mass (total volume and thickness)
2. The temperature of the material
3. Maximum temperature reached during the exotherm (reaction).
The faster the gel time, the higher the exotherm, the greater the shrinkage.
4. The temperature of the mold
5. The thermal properties of the mold material.(Insulator vs. Conductive)

Geometry, part thickness, and total volume vary in each design, therefore, the customer is responsible to test and determine the shrinkage factor to be used. The values in the brochures are for comparative reference only, using ASTM testing procedures.

AIR RELEASE:

Use HAPCO'S ANTI-AIR to aid in air release (see Technical Bulletin). In some products, ANTI-AIR can cause a slight haze to cloudiness. This has no effect on properties.

CLEAN UP:

Cured polymers are difficult to remove. It is best to clean tools and equipment immediately after use. For best results use Hapco's A-TAK.

STORAGE:

Store both components in an area with a temperature range of 68-90°F (20-32°C). Store in a dry place off of cement floors and on shelving if possible. Containers should be kept tightly closed.

SHELF LIFE:

Polymer systems have a minimum shelf life of six months when unopened. The shelf life on Hapco products begins from the date of invoice for that product shipment. Hapco's shelf life only pertains to containers that are unopened and in their original condition. Once the container is opened Hapco has no control or responsibility for the shelf life.

RESEALING:

Many polymers are moisture sensitive, reseal, using one of the following methods:
Blanket with nitrogen or use a hair dryer for 30 seconds to cover with dry air.

PRECAUTIONS:

CAUTION: The MSDS should be read thoroughly before using this product.

Skin or eye contact with polymers should be avoided. The use of gloves, eye protection, and face masks are strongly recommended. All polymers, as a general practice, should be used in well-ventilated areas. Spot ventilation is most effective. Contaminated clothing should be removed immediately and the skin washed with soap and water or waterless skin cleaner. Should accidental eye contact occur, wash thoroughly with water and consult a physician.

The information presented here is based on carefully conducted laboratory tests and is believed to be accurate. However, results cannot be guaranteed and it is suggested that customers confirm results under their conditions and in their applications before production use.

Important: Hapco Inc. makes no warranty, whether expressed or implied, including warranties of merchantability or of fitness for a particular purpose. Under no circumstances shall Hapco Inc. be liable for incidental, consequential, or other damages from alleged negligence, breach of warranty, strict liability, tort contract, or any other legal theory, arising out of the use of handling of this product. The sole remedy of purchaser and sole liability of Hapco Inc. shall be for the purchase price of the product which is the subject of the claim.