

VIVAK HT[®] S H E E T

Fabricating, Forming,
Finishing Guide

Sheffield
Plastics Inc.

A  Bayer Polymers Company

VIVAK HT[®] SHEET:

A New Generation Is Forming

VIVAK HT Sheet provides sign fabricators with an exciting new material that offers high impact resistance, superior forming qualities, and faster cycle times. The material is suitable for the production of formed vinyl faces, distortion printing, and detail-oriented images. The uniform shrink rates associated with VIVAK HT Sheet make it a highly desirable product for forming with distortion print screening. In addition, with a HDT (heat deflection temperature) of 180°F, VIVAK HT Sheet delivers the heat stability demanded by the sign industry.

VIVAK HT Sheet allows you to fabricate large, complex shapes cost effectively compared to both polycarbonate and acrylic. Its higher performance when compared to acrylic translates into possible down gauging and higher thermoforming production rates. Higher flatwise impact also means less breakage during production, resulting in higher margins and lower costs. VIVAK HT Sheet offers deep draws, complex die cuts, and precise molded-in details, without sacrificing structural integrity. It can be bonded or fastened with adhesives, tapes, or rivets.

In the sign business, picking the right substrate requires balancing the performance properties of a material against the requirements of the job. With lower forming temperatures and faster cooling cycles, VIVAK HT Sheet is an excellent substrate selection for faces formed with vinyl. If impact resistance is an issue, VIVAK HT Sheet has an average of 19 times the impact strength of impact modified acrylic. Picking the right materials can ensure success in a difficult application. At Sheffield, we work with sign companies every day to troubleshoot, solve problems, and help customers pick the right material to meet requirements.

Features and Benefits:

- Complex Die Cutting
- Riveting
- Down Gauging
- Punching
- Superior Impact Strength Compared to Acrylics

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Sawing Recommendations

Sawing

A circular blade with carbide-tipped teeth utilizing the "triple-chip" tooth design is the preferred method of cutting VIVAK HT® Sheet. Table or overhead saws can be used successfully.

Circular Saws

Circular saws should be run at relatively high speeds in the range of 8,000-12,000 linear feet per minute. Blades should have 3-5 teeth per inch. As a general rule, thicker gauge sheet requires fewer teeth per inch. A circular saw is preferable to a band saw for straight cuts, because a smoother cut can be achieved. When sawing thin gauge sheet, it is important to have a good supporting edge on the saw table with minimal gap between the saw blade and table edge. When stack cutting, it is a good idea to clamp the top surface to prevent vibration. Be sure tabletops are smooth and free of projections that might scratch or mar the VIVAK HT Sheet.

Band Saws

Band saws are useful for trimming formed parts or irregular shapes. Band saws should be run at 2,000 feet per minute and have between 6-10 teeth per inch. Coarser (larger tooth) blades perform better with thicker gauge plastic. Because vibration can induce cracking of VIVAK HT Sheet, proper support of the part to be trimmed is important. If the cut edge is not smooth, cracks will propagate from rough or notched edges.

Note: Always use proper eye protection when sawing

| Type of Cut | Tool | Blade Type | Blade Parameters | Blade Speed |
|-----------------------|-----------------|--|--|--------------|
| Straight Cut | Circular Saw | Triple-chip Design | 7-1/4" diameter, 40 teeth (carbide-tipped cutoff) 7-1/4" diameter, 200 teeth plywood blade | 4,500 rpm |
| Curved Cut | Saber or Jigsaw | Finish Cutting Blade | 10 teeth per inch | |
| Curved Cut | Band saw | 1/2" | 6 teeth per inch | 2,000 ft/min |
| Trimming & Deflanging | Router | Carbide-tipped or High-speed Steel, Double Fluted Circular | 3/8" diameter preferred 4 wing, carbide tip, 1/16" kerf slotting cutter (Whitestone Machine Co. Part # 67008) | 20,000 rpm |
| | Circular Saw | Blade 3.4-4" Diameter | Multipurpose wood-2-3 teeth/inch | |

to feed the sheet against the rotation of the router bit and to provide a fence for sizing. Router bits must be kept sharp. Cooling the bit with compressed air during operation will aid chip removal and prolong sharpness.

Band Saw Troubleshooting

Problem: Melting or Gummed Edges

Suggested Solutions:

1. Increase tooth size
2. Reduce saw speed
3. Use air to cool blade
4. Check blade sharpness

Problem: Chipping

Suggested Solutions:

1. Decrease tooth size
2. Slow down stock feed rate
3. Provide better clamping and/or support to eliminate vibration
4. Check blade sharpness

Circular Saw Troubleshooting

Problem: Melting or Gummed Edges

Suggested Solutions:

1. Different Saw Blade
2. Increase blade tooth size
3. Reduce saw speed
4. Provide better clamping and/or support for material
5. Use air to cool blade
6. Reduce feed rate
7. Inspect blade for sharpness

Problem: Chipping

Suggested Solutions:

1. Different Saw Blade
2. Decrease blade tooth size
3. Increase saw speed
4. Increase feed rate
5. Inspect blade for sharpness
6. Check blade and arbor for wobble
7. Check blade fence alignment

Routing

Routing produces a smooth edge on VIVAK HT Sheet and can be employed to cut curved or irregular shapes. Routers with a speed of 20,000 to 25,000 rpm are preferred. Use straight fluted carbide-tipped router bits. High-speed steel bits may also be used. Bits should be 3/8" to 1/2" diameter for best results. Portable routers, over-arm routers, or under-the-table routers are all useful. Use a router with at least a 1 h.p. motor. Circular blades with an arbor may also be utilized. Use blade with 4 wings, carbide tipped, 1/16" kerf, slotting cutter blade as recommended above.

Special care must be used when routing. Use proper guarding and eye protection. Stock feed rates need to be monitored. Feeding VIVAK HT Sheet, at fast rates can result in shattering. It is important

Drilling

Drills specifically designed for plastics are recommended. Standard twist drills for metal or wood can also be useful.

VIVAK HT Sheet is easily drilled using zero-degree rake angle bits with dubbed off cutting edges. Regulate pressure and speed until a continuous spiraling chip is observed. Back out drill regularly to free chips. This is particularly important when drilling deep holes. Typically, peripheral speeds of twist drills for plastics range from 100 to 200 feet per minute. The rate of drill feed into the VIVAK HT Sheet can vary from 0.010 to 0.025 inch per revolution.

Use air or water as a coolant, if required. Do not use cutting oils. Do not drill and tap or use self-tapping screws. Like most other transparent plastics, VIVAK HT Sheet is a notch-sensitive material and the cutting threads develop stress points that can create stress crazing or cracking.

Be sure drilled holes are smooth with no evidence of cracks or roughness, which can cause weak areas in fastening. Always hold or clamp securely to prevent cracking or slipping and to ensure operator safety.

Saw Blade Suppliers:

Dino Saw, Inc.
340 Power Avenue
Hudson, NY 12534
Tel: (518) 828-9942

Forrest Mfg.
457 River Road
Clifton, NJ 07014
Tel: (973) 473-5236

General Saw
2518 Andalucia Blvd.
Cape Coral, FL 33909
Tel: (941) 574-2707

Router Circular Blades:
Whiteside Machine Co.
5400 Shook Road
Claremont, NC 28610
www.whitesiderouterbits.com
Tel: (800) 225-3982

FORMING

Thermoforming

VIVAK HT® Sheet offers deeper draws without the webbing often associated with acrylic. It can be thermoformed on standard equipment. The most extensively used processes are vacuum forming, free blown forming, and line bending.

Forming Equipment

The thermoforming machine should be capable of generating and maintaining sufficient vacuum pressure throughout the thermoforming cycle. A minimum of 20 in. Hg. throughout the entire vacuum cycle is required to retain part integrity.

VIVAK HT Sheet forms well with many commonly used vacuum forming machines with infrared heating elements. Rotary and shuttle designs with automatic or semiautomatic controls are most suitable. Key features of this type of equipment include: timer control accuracy, uniform heating sources, and sufficient vacuum power. Single-sided heating has proven effective for VIVAK HT Sheet in gauges up to .177". For thicknesses above .177", dual-sided heating ovens can be used for faster radiation penetration, quicker cycle times, and avoidance of overheating the surface of the sheet.

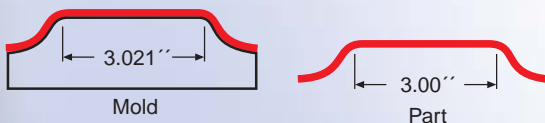
Heaters

Infrared cal rod, coiled nichrome, or ceramic heating elements provide the best heating sources. Uniform heating of the sheet is critical. Matching the emissivity of the heating elements provides the most efficient heat penetration.

Typical Mold Materials Thermal Conductivity Properties

| Material | Heat Transfer Rate Factor | K Value BTU/HR/SF/F/FT |
|-----------------------|---------------------------|------------------------|
| Aluminum | 6190 | 130 |
| Steel | 1238 | 26 |
| Aluminum filled epoxy | 24-47 | .52-.87 |
| Plaster of paris | 8.29 | .17 |
| Epoxy | 6.24 | .13 |
| Wood (maple) | 4.48 | .09 |

Mold Shrinkage



Mold Materials and Mold Design

VIVAK HT Sheet allows the use of a wide variety of mold materials including: wood, filled and unfilled polyesters, epoxies, and metals.

Molds for vacuum forming need to take only 14 psi, so there is little wear on the tooling with low pressure of the material against the mold surface.

Use standard mold design practices and mold materials.

Molds

Although male molds are more suitable for vacuum forming in general, other factors such as part size, finish, and shape must be considered in mold design. Choice of mold materials should be determined by considering the length of the production run. For optimum cost-effectiveness, use the least expensive material that will take the entire run.

It is evident that thermal transfer is much more efficient with aluminum than wood. Wood, however, can be utilized for short-run projects.

VIVAK HT Sheet tends to reproduce mold surface finish quite faithfully, even to the point of replicating wood grain in a smooth wood mold.

Sometimes it is desirable to reduce the polish on a steel or aluminum mold by utilizing a vapor hone or bead blast. This is due to the fact that if the mold surface is too smooth, air entrapment can occur creating "mark off". For best results, use fine hand sanding on the surfaces. Sanding provides tiny channels for air evacuation to prevent air entrapment. This may have to be repeated on long production runs, as the sanded finish smooths out from extended use.

When constructing the mold, mold shrinkage should be a design consideration. Shrinkage for VIVAK HT Sheet is .005"-.007"/in. The heating/cooling cycle and the type of vacuum forming equipment will also influence results.

Mold Design

Draft Angles: Minimum 5°-7° or greater for ease of part removal from the mold.

Radii and Fillets: Use generous radii (equal to thickness of sheet) wherever possible for more uniform walls, stress reduction, and greater rigidity. On female tooling, use permanent corner fillets.

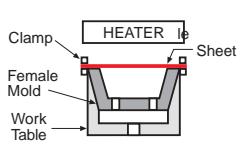
Vacuum Holes: In order to form the sheet as rapidly as possible, use sufficient holes for fast evacuation of air from between the sheet and the mold. In female molds, use air evacuation holes at all deep draw areas, especially around the mold perimeter where the sheet will be drawn last.

Helpful Hints

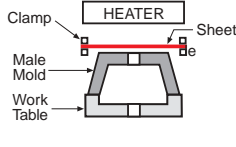
- Keep the diameter of the holes small (approximately 1/64"-1/32" diameter) to avoid marking on the sheet. Long, thin slots may be designed for air evacuation in female tooling.
- Use vapor honed or fine sanded finishes
- Avoid sharp corners to minimize stress
- Avoid highly polished surfaces that can cause mark off
- If mold temperature becomes too high during thermoforming runs, VIVAK HT Sheet could stick to the mold. It is recommended that the mold temperature not exceed 150°F.



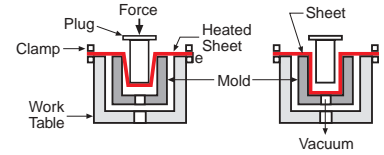
Mold Design Continued



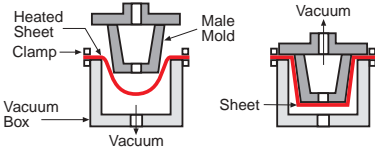
Straight vacuum forming in a female mold is recommended for low-profile parts where deep draw is not a requirement.



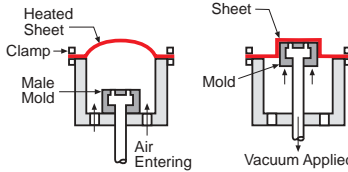
Drape forming over a male mold usually results in better material distribution and depth-to-diameter draw ratios.



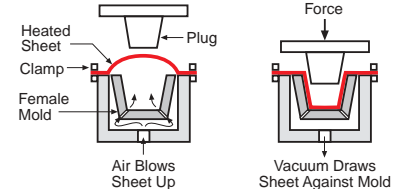
Thinning of material in deep-mold cavities can be overcome by use of plug assists designed for fast penetration.



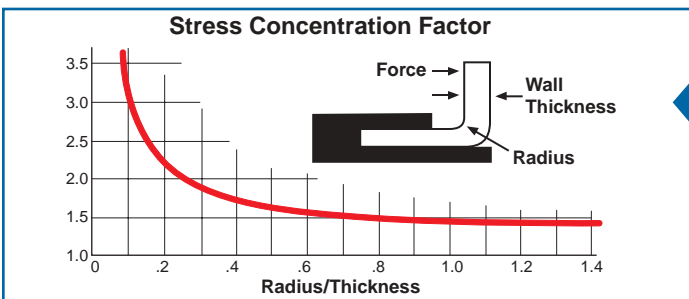
Vacuum forming with snap-back can reduce starting sheet size, aid material distribution, and minimize chill marks.



Air-slip forming is similar to vacuum snap-back except that heated sheet is billowed up and mold rises to meet it.



Forming with billow plug is often used to produce thin-wall items with depth-to-diameter draw ratios up to 1.5:1.



Larger radii distributes stress uniformly

Note: The minimum suggested radii for notch sensitive materials are 1/2 the nominal wall thickness. Because of the ability of VIVAK HT® to obtain excellent mold detail, it is suggested the radii be equal to the nominal thickness of the sheet.

Illustration courtesy—S.P.J. Plastics Engineering Handbook

Forming Guidelines

| | |
|--|--|
| Sheet Temperature Typical: 260°F-320°F | Mold Temperature 135°F-145°F |
|--|--|

Helpful Hint

- Throughout the vacuum forming process, it is imperative that dust and dirt be controlled. VIVAK HT Sheet has a static charge that attracts foreign particles which can create surface imperfections. Molds also attract dust particles and should be cleaned to avoid creating surface defects.

Thermoforming Troubleshooting

| Problem | Possible Cause | Suggested Solution |
|--|---|---|
| Part weak or crazed | <ul style="list-style-type: none"> Forming temperature too low Radii too small | <ul style="list-style-type: none"> Increase heat setting Increase time in oven Increase radii |
| Webbing | <ul style="list-style-type: none"> Uneven Heat Mold spacing too close in multiple mold | <ul style="list-style-type: none"> Check for hot spots in heaters Spacing between molds should be 2" x height Restrict vacuum |
| Part sticks to mold | <ul style="list-style-type: none"> Vacuum rate too fast | <ul style="list-style-type: none"> Reduce mold temp Increase draft Increase radii |
| Mark off | <ul style="list-style-type: none"> Mold too hot Not enough draft angle Radii too small | <ul style="list-style-type: none"> Vapor hone or sand with light finish sandpaper |
| Pinholes on surface | <ul style="list-style-type: none"> Mold finish too smooth | <ul style="list-style-type: none"> Blow off sheet and mold with air |
| Incomplete part detail | <ul style="list-style-type: none"> Dust on sheet or mold | <ul style="list-style-type: none"> Insufficient vacuum Check system for vacuum leaks; add more vacuum holes Sheet too cold Increase heat setting and/or increase time in oven |
| Bubbles in sheet | <ul style="list-style-type: none"> Excessive heat | <ul style="list-style-type: none"> Reduce heat setting and/or decrease time in oven |
| Nonuniform sag | <ul style="list-style-type: none"> Uneven heating | <ul style="list-style-type: none"> Check heaters Screen "hot" areas |
| Sheet pulls out of clamping frame during forming | <ul style="list-style-type: none"> Sheet too cold to form Inadequate clamping force | <ul style="list-style-type: none"> Heat sheet for longer time period Increase clamping force |

Heating Cycle

Heating VIVAK HT® Sheet for vacuum forming requires heat penetration to achieve a 260°F to 320°F range. When VIVAK HT Sheet reaches forming temperature, uniform "sag" occurs. The amount of sag depends on the size and thickness of the sheet. A 12" x 12" x .060" sheet will sag approximately 1". A 36" x 36" x .177" sheet may sag 4"-6" at the center. Once the uniform temperature has been achieved, timers can accurately reproduce the condition, and part-to-part consistency can be maintained.

Procedure

- Sheet thicknesses up to .177" gauge can be heated from one side. Above .177" gauge, two-sided heating is normally required to significantly enhance productivity and maintain uniform heating of sheet.
- Heat source is removed and heated sheet is forced over or into mold where vacuum is applied.

Shading or Screening

Shading is often used to balance out hot spots in an oven for uniform temperature. Shading may also be used to control the sag of VIVAK HT Sheet during heating.

Procedure

- Use heavy-duty metal screening to shade the major portion of the clamped sheet, leaving several inches along the edges unshaded to compensate for cooler areas.
- Screens can be installed permanently or placed loosely above the Sheet, depending on how much shading is required.

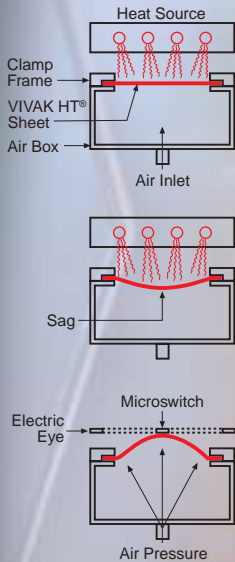
Helpful Hints

- Use slow heating. This is particularly important with heavier gauges in order to prevent gradient heating.
- Allow heat to reach uniformity at the center of the sheet.
- The heating rate may be reduced by lowering the heat intensity or by moving the sheet farther away from the heaters.
- Avoid overheating or superheating the surface of the sheet during the heating cycle. This could cause blistering of the surface prior to forming.

FORMING CONTINUED

Free Blown Billow Forming of Dome

This process is utilized for forming dome shapes from VIVAK HT® Sheet. The procedures and equipment are the same as vacuum forming with the exception of the mold. Billow forming can be done with positive air pressure (free blown) or negative pressure (vacuum).

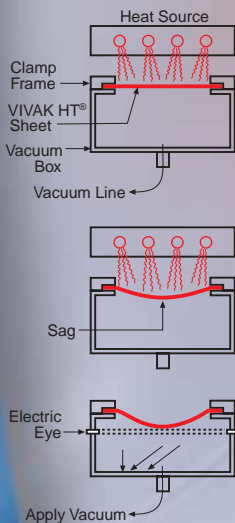


Procedure

- Place VIVAK HT Sheet in clamping frame of thermoforming machine
- Heat sheet until uniform sag occurs (260°F - 320°F)
- Remove heat source
- Lower pressure box to seal air supply pressure
- Apply air pressure. Initial air pressure is high, and as dome is created, air pressure is reduced.
- When overall height is achieved, maintain positive air pressure until part cools
- Be sure air source is properly filtered and uniformly dispersed for even formation of dome
- Utilize electric eye designs or micro-switches to assure consistent product
- When dome reaches electric eye, set height. The eye controls air pressure through a solenoid valve to control cooling
- Remove and trim

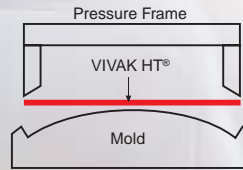
Free Drawn Vacuum Dome Forming

Follow steps involved in vacuum thermoforming.



Procedure

- Place sheet in clamping frame of thermoforming machine
- Heat sheet until uniform sag occurs (260°F - 320°F)
- Remove heat source
- Apply vacuum seal box and apply vacuum pressure
- Use electric eye or microswitch to assure consistency of depth of dome
- Retain small amount of vacuum pressure until dome sets up
- Remove and trim

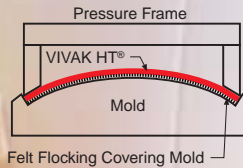


Drape Forming

Simple contours can be achieved by drape forming VIVAK HT® Sheet

Procedure

- This method can be utilized to manufacture a part requiring a simple radius of curvature. Mold material can be wood, fiberglass, or aluminum covered with felt.
- Bring to forming temperature of about 260°F-320°F in the oven. Care should be taken not to overheat or superheat the surface of the sheet. This may cause blistering of the surface.
 - Remove parts and immediately place over a male mold covered with felt



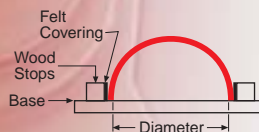
Cylindrical Forming

This method is useful for short run projects that are not cost-effective using drape-form molds, or where cold-forming is not applicable (i.e., frameless curved parts).

Procedure

- Position stops until the desired diameter is achieved
- Cold form VIVAK HT Sheet into place between stop
- Heat the VIVAK HT Sheet in curved position for the normal cycle time
- Allow to cool, then remove from form

Note: Do not overheat. Closely monitor procedure for best results.



Registration Forming

VIVAK HT® Sheet is suitable for registration vacuum forming. Because the material is extruded, it is important to orient the sheet so that each part is screened and formed in the same direction each time. Material should be special ordered for this application. Shrink tests indicate VIVAK HT Sheet in free form shrinks about 5% in the direction of extrusion and 1% across the extrusion web.

Thermoforming Machine Suppliers:

Brown Machine
330 North Ross Street
Beaverton, MI 48612
Tel: (989) 435-7741

Plastic Thermoforming Systems
The Shuman Company
3232 South Boulevard
Charlotte, NC 28203

Plastic-Vac, Inc.
214 Dalton Avenue
Charlotte, NC 28206
Tel: (800) 438-4139

Flocking Supplier:
Ohio Flock-Cote Co.
7200 North Field Road
Walton Hills, OH 44146
Tel: (440) 439-1480

Adhesive Bonding

The recommended method for bonding VIVAK HT® Sheet to itself or acrylic and polycarbonate is the use of 2-part adhesives such as Weld-on 55 or Weld-on 42 (both give clear bonds). Other clear adhesives that work well are UV systems such as Dymax 3094 and Loctite 3105 (clear bond). When clarity is not an issue, Lord Adhesives #7542 is recommended for bonding any of the three substrates to HT.

Solvent Bonding

Solvent bonding of VIVAK HT Sheet is not recommended. It may result in both embrittlement of the material and haze formation.

Mechanical Fastening

Self-closing rivets and machine screws may be used to join VIVAK HT Sheet parts, if proper consideration is given to the installation. Use oversized holes at least 1/64" larger than the fastener. A cushion-type washer should be used to avoid localized stress on VIVAK HT Sheet. Use plastic or aluminum fasteners. Mechanical fastening will produce a stronger part than adhesive bonded parts and allows for easier disassembly and cleaning.

Adhesive Suppliers:

WELD-ON Cements:

IPS Corporation
17109 S. Main Street
Gardena, CA 90248
Tel: (800) 421-2677
(310) 898-3300

Lord Adhesive
111 Lord Drive
P.O. Box 8012
Cary, NC 27512
Tel: (919) 468-5979
Fax: (919) 469-5777
www.lordadhesives.com

Screen Printing

VIVAK HT Sheet can be printed with conventional printing equipment. Since the ink does not penetrate plastic, special printing inks are necessary. Abrasion can be minimized by applying a light coat of clear lacquer over the printing. Consider each application individually to decide on the best ink for the specific job. Consult with ink manufacturers for best results.

Procedure

- VIVAK HT Sheet provides an excellent medium for signs, when using standard silk screening equipment with screens of varying mesh (8x to 16x) regulating the amount of ink coverage
- As with all thermoplastics, it is very important to be sure the sheet is clean and free from dust and dirt prior to screening.
- Use ionized air to clean dust or prerinse with alcohol and a soft, nonabrasive cloth

Helpful Hints

- After screening, separate sheets on a drying rack until ink is fully cured
- Do not pack sheets for shipment until inks are dry

The recommended screen printing ink for VIVAK HT Sheet is the Coates-Screen UV cured VAC series inks.

Evaluation of other solvent based and UV cure inks is underway with recommendations to follow upon completion of this work (Nazdar, Coates-Screen, and Spraylat solvent based inks and Nazdar UV cured formable links).

Painting

The recommended paint system for VIVAK HT Sheet is Spraylat 400 Series with 205T thinner. Use of aggressive thinners such as 200T have been shown to reduce the impact properties of VIVAK HT Sheet and are not recommended.

Akzo-Nobel paint systems are currently under evaluation and recommendations will be added as this work is completed.

Paint Suppliers:

Spraylat Corporation
716 South Columbus Ave.
Mt. Vernon, NY 10550
Tel: (914) 699-3030

AKZO-Nobel.
5555 Spalding Drive
Norcross, GA 30092
Tel: (800) 233-2303

Screen Print Suppliers:

Nor-Cote International, Inc.
506 Lafayette Ave.
Crawfordsville, IN 47933
Tel: (800) 488-9180

Kolorcure
1180 Lyon Road
Batavia, IL 60510
Tel: (630) 879-9050

Coates Screen Inc.
180 East Union Avenue
East Rutherford, NJ 07073
Tel: (201) 933-6100

NazDar
8501 Hedge Lane Terrace
Shawnee, KS 66227
Tel: (800) 767-9942

PERFORMANCE

VIVAK HT® Sheet combines an excellent balance of properties for a wide range of fabricated products.

TYPICAL PHYSICAL PROPERTIES OF VIVAK HT SHEET

| Property | VIVAK HT Sheet | Units | Test Method |
|--|----------------|-----------------------------|-------------|
| General | | | |
| Specific Gravity | 1.2 | - | ASTM D-792 |
| Water Absorption after 24 hrs. | 0.13 | % | ASTM D-570 |
| Thermal | | | |
| Deflection Temperature @ 264 psi | 185 | °F | ASTM D-648 |
| Deflection Temperature @ 66 psi | 198 | °F | ASTM D-648 |
| Coefficient of Thermal Expansion | 4.1 | in/in/°F x 10 ⁻⁵ | ASTM D-696 |
| Flammability ≥ .060" | HB | - | UL 94 |
| Glass Transition Temperature | 215 | °F | - |
| Forming Temperature | 260°-320° | °F | - |
| Mechanical | | | |
| Tensile Strength, Ultimate .118" | 8,500 | psi | ASTM D-638 |
| Tensile Modulus .118" | 300,000 | psi | ASTM D-638 |
| Flexural Strength .118" | 13,000 | psi | ASTM D-790 |
| Flexural Modulus .118" | 310,000 | psi | ASTM D-790 |
| Izod Impact Notched .118" at 73° | 1.5 | ft. lb/in | ASTM D-256 |
| Izod Impact Notched .118" at 32° | 1.4 | ft. lb/in | ASTM D-256 |
| Drop Dart Impact .118" at 73° (@ max load) | 46 | ft. lbs | ASTM D-3763 |
| Drop Dart Impact .118" at 32° (@ max load) | 53 | ft. lbs | ASTM D-3763 |
| Rockwell Hardness | 115 | R Scale | ASTM D-785 |
| Optical | | | |
| Light Transmission .118" | 89 | % | ASTM D-1003 |
| Refractive Index | 1.57 | - | ASTM D-542 |
| Haze .118" | <1 | % | ASTM D-1003 |

Application Limitations

VIVAK HT Sheet, like any thermoplastic, has its performance limitations under specific conditions and in particular environments. When selecting a product, the environment and the conditions under which the product is to be used should be considered by the user.

Performance Comparison

Compare VIVAK HT Sheet's performance for interior fabricated and formed applications. It delivers an optimum balance of performance and economy.

Impact Strength: Falling Dart @ 73°F

| ASTM D-5420 @ .125" | Acrylic | Polycarbonate | VIVAK HT Sheet |
|---------------------------|---------|---------------|----------------|
| 10 in/lbs. | Failed | No break | No break |
| 100 in/lbs. | Failed | No break | No break |
| 300 in/lbs. | Failed | No break | No break |
| Heat Distortion @ 264 psi | 190°F | 270°F | 185°F |
| @ 66 psi | | 280°F | 198°F |
| Chemical Resistance | Poor | Fair | Good |

Material Availability

| Materials | Gauge Range | Colors | Patterns | Sizes |
|----------------|-------------|---|--|---|
| VIVAK HT Sheet | .118"-.250" | Standard: • Clear • Translucent • White | Standard: • Polished 2 Sides | Standard: • 52" x 100" • 76" x 100" Reels |

**For Additional Information
Please Contact...**

**Sheffield Plastics Inc.
Customer Service Department
Phone: 800-254-1707
FAX: 800-457-3553
www.sheffieldplastics.com**

Sheffield will not be responsible for the use of this information relative to actual application. Users must make their own determination of its suitability for their specific use. No warranty is made for the fitness of any product, and nothing herein waives any of the seller's condition of sales.

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