PRODUCT DESCRIPTION
AQUENCE® KL 3047 is a thermosetting emulsion adhesive. It is specifically formulated to have superior sandability and a more rigid glue line for curved plywood applications. Its fast setting properties can significantly reduce cure cycles on RF or hot press equipment resulting in increased production rates. It can also be cold pressed. AQUENCE® KL 3047 can be used in these gluing operations: veneering panels, edge-gluing solid lumber core, curved plywood, high pressure laminate to core, lumber edge-banding, flush doors (solid and hollow core), panel-on-frame, edge-banding with hot strip heaters. This is a version of AQUENCE® KL 3047 having a very low formaldehyde content.

INTRODUCTION
In discussing RF curing or hot pressing of AQUENCE® thermosetting emulsion adhesives, it is important to first define handling bond, setting speed and curing time.

Handling Bond:
A bond of sufficient strength to hold the construction together during normal post press handling.

Setting Speed:
The time required to form a handling bond in a particular construction.

TYPICAL PROPERTIES
Viscosity:
Approx. 5,000 cps before adding catalyst.

Weight/Gallon:
Approx. 9.3 lbs.

Freeze/Thaw Stability:
Fair. PROTECT FROM FREEZING.

Thinner:
Water. Dilution not normally recommended as it slows setting time.

pH:
Approx. 4.7

SEE CAUTIONS REGARDING HANDLING OF CATALYST

OTHER PRECAUTIONS
Keep adhesive covered to prevent drying out and contamination. Do not mix with other adhesives.

CURRING TIME
The time required for the development (through chemical reaction) of a completely set bond having maximum properties obtainable. RF curing or hot pressing is a means of applying heat to a glue line. Both setting speed and cure time are temperature dependent. Some curing occurs as the adhesive sets in the press but cure will continue at room temperature after removal from the press. Handling bond is not dependent upon complete curing of the AQUENCE adhesive. The construction can be removed from the press at a much earlier stage than with conventional thermosetting adhesives which must be fully cured in the press.

TYPE OF PRODUCT
AQUENCE® KL 3047 is a crosslinking emulsion adhesive which is very receptive to heat-curing.

IMPORTANT NOTE
AQUENCE adhesives have been used in production with a wide variety of the more common wood species. Aging data has shown excellent performance in both actual service and accelerated testing. It is suggested, however, that the adhesive be evaluated under the production and service conditions under which it is expected to perform.

MIXING INSTRUCTIONS
AQUENCE® KL 3047 must be accurately and thoroughly mixed with Catalyst 2301 prior to use. Normal catalyst concentration is 3% on the AQUENCE emulsion by weight. Because some RF equipment cannot be sufficiently adjusted to prevent arcing, a reduction of catalyst level to 2% may become necessary. With the standard Catalyst 2301, the glue line is normally a translucent, light straw color but this varies somewhat with wood species. If glue line color is important, the wood species involved in any particular operation should be checked for staining. Stir adhesive during catalyst addition and continue agitation for at least 5 minutes to assure a uniform mixture. For convenient volumetric addition of catalyst at the 3% level, add 3-1/3 fluid ounces of Catalyst 2301 to one gallon of adhesive.

CAUTION!
Catalysts are acidic in nature. HANDLE WITH CARE! Protect eyes from catalyst. Should skin contact occur, wash the area immediately with water. In case of eye contact, flush with large amounts of water. Call physician immediately.

APPLICATION
A powered roll glue spreader is recommended. Helical grooving, 14 lines per inch, is preferred. Adhesive can be pumped to the spreader.

Spread Rate:
Adhesive is spread on one surface only. 35-45 pounds/1000 square feet, single glue line, is normally recommended. Quantity depends on material and nature of surface. With various
surfaces, spread rates of from 35 to 60 pounds/1000 square feet, single glue line, have been used successfully. Press time is also affected by spread, open assembly time and closed assembly time. A suggested schedule for wood to wood follows:

**Open Assembly Time:**
3 minutes maximum and preferably less.

**Closed Assembly Time:**
20 minutes maximum at 35 pounds/1000 square feet spread rate.
30 minutes maximum at 40 pounds/1000 square feet spread rate.

**Stand Time:**
Keep as short as possible.

**Press Time:**
30 minutes (cold press).

**PRESS SCHEDULE ON HOT PRESS EQUIPMENT**
Press schedule will vary with operating conditions such as spread rate, open assembly time, closed assembly time and platen temperature. The nature and thickness of the adherends also affect press time. Generally, the press cycle when using AQUENCE® KL 3047 will be one-half (½) that of a typical urea resin pressed at the same temperature. The attached graph gives the relationship between platen temperature and press time required to achieve a handling bond for some common laminations. For practical purposes, the press schedule for regular thermosetting adhesives includes time to reach a given temperature plus additional time to cure the adhesive. With AQUENCE® KL 3047, the normal press schedule can generally be substantially reduced since curing does not have to be completed in the press. The construction can be removed from the press as soon as the AQUENCE glue line is set. At this point, laminations are suitable for further processing. Complete cure will proceed at normal room temperature.

**PRESSURE REQUIREMENTS**
The pressure required to assure good contact between surfaces to be bonded is an important factor in obtaining good bonds. For flat laminations, glue line pressure should be 30-100 psi. When higher pressures are required (175-200 psi for hard woods; 100-150 psi for soft woods; in edge-gluing or face-gluing, open and/or closed assembly time should be increased to prevent starved glue lines.

**POWER REQUIREMENTS FOR RF EQUIPMENT**
Because AQUENCE® KL 3047 differs in chemical composition from those adhesives most commonly used on RF equipment, a lower power setting will generally be required to produce workable amperage without arcing. Once power setting is established, minimum cure time can be estimated by observing the amperage drop-off. The point at which minimal changes in amperage are observed usually defines the point at which there is sufficient set of the adhesive to give a handling bond.

**PERFORMANCE**
Bond quality has been found to be excellent on a wide variety of wood species. Actual strength obtainable is dependent on joint preparation and operating conditions. AQUENCE® KL 3047 conforms to the Type II specification of HP 1983 and to the Type I specifications of NWWDA IS 1-87.

**WORKING LIFE**
At least 24 hours at 70°F. At low catalyst levels, the mixture is often usable for 2 or 3 days after mixing.

**STORAGE LIFE**
AUSENCE® KL 3047 is stable for 3 months at 70°F from date of manufacture. Maximum stability is obtained if adhesive is stored between 40°F and 60°F. The viscosity of the adhesive will increase with time in storage. Containers are dated so that storage life can be determined easily. Be sure to rotate stock and use oldest material first.

**Note**
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PLATEN TEMPERATURE VS PRESS CYCLE TO OBTAIN HANDLING BOND

<table>
<thead>
<tr>
<th>CONSTRUCTION</th>
<th>SPREAD RATE*</th>
<th>PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Glue Line</td>
<td></td>
</tr>
<tr>
<td>(A) 1/4&quot; fir plywood to lumber</td>
<td>35 lbs/M ft²</td>
<td>100 psi</td>
</tr>
<tr>
<td>(B) 1/8&quot; birch plywood to lumber</td>
<td>35 lbs/M ft²</td>
<td>100 psi</td>
</tr>
<tr>
<td>(C) 1/16&quot; high pressure laminate to fir plywood</td>
<td>35 lbs/M ft²</td>
<td>100 psi</td>
</tr>
<tr>
<td>(D) 1/28&quot; veneer (3-ply construction)</td>
<td>35 lbs/M ft²</td>
<td>30 psi</td>
</tr>
<tr>
<td>(E) 1/28&quot; veneer with 1/16&quot; crossband construction</td>
<td>25 lbs/M ft²</td>
<td>100 psi</td>
</tr>
</tbody>
</table>

NOTE: PRESS SCHEDULE:
Open Assembly: 30 seconds
Closed Assembly: 60 seconds