THE TRAY STACK CENTRICITY MEASURING
Nine different close-stacked trays are desired to be denested in the one and same SPEED-DISP A2 tray denesting machine.

Nine different trays manufactured by the same tray manufacturer.
Manufactured with different designs by means of different moulds.
Even though the various trays are described as belonging to the same product family, there are numerous variations and differences, when individual trays are assessed, measured and compared.

- Many of the trays have different nominal L + W measurements in the data sheet.
- Many of the trays have different tolerances on the L + W measurements in the data sheet.
- Many of the trays have different centricity tolerances in the data sheet.
- Different tray heights.
- Different tray edge heights.
- Different stacking distances.
- Different foil thicknesses.
- Different foil materials, combinations and colours.
- Different stacking lug designs.
- Non-uniformity in the stacking of trays.
- Several trays exceed the indicated tolerances.
- Stacking errors, wrong use of stacking lugs.

Setting up the JKT measuring device.
When starting a new tray denesting project JKT always requests the technical data sheets of all the different trays. After that, JKT will assess all the different trays. With reference to LENGTH and WIDTH measurements mentioned in the respective data sheets, JKT now sets a starting point for the following survey and control of the tray measurements. The measuring device is now calibrated at this starting point, which is subsequently regarded as a our theoretical zero point.
To prepare the JKT sheet, and before the tray stack measurement, the following data is manually filled into the JKT sheet.

Data with reference to the actual tray:
Data taken directly from the respective data sheets.
The trays nominal LENGTH and WIDTH measurement.
The trays nominal LENGTH and WIDTH measurement tolerances.
The tolerances on trays centricity measurement. LENGTH and WIDTH plus and minus.
Data from all the nine different trays is manually filled into the JKT sheet.
The sheet is now informing about the theoretical largest and smallest measurements of the nine different trays LENGTH and WIDTH.

JKT related data:
The measurement device is already calibrated, and the LENGTH and WIDTH measurements is are also filled into the JKT sheet.

The tray stack 01 is placed in the measurement device.
The tray stacks, are always tested with a stack HEIGHT of 50 mms.
The tray stack is placed in the measurement device, in bottom upwards direction.
The tray stacks LENGTH is measured.
The measurement results is digital transferred to the PC and JKT table.

The tray stacks WIDTH is measured.
The measurement results is digital transferred to the PC and JKT table.
The procedure is repeated with the remaining 8 tray stacks.
If JKT finds it necessary, the procedure will be repeated, then a second time with a (180 degrees) rotated tray stack.
All measurement results are processed automatically. It is now possible, in the JKT sheet, to see and study the different and useful information.

**TRAY STACK**
The tray stacks current length and width measurements are informed. It is informed whether the respective tray stacks are within the stated nominal dimensions when their announced centricities tolerances are included. It is verified, if the tray stacks centricity tolerances compile with the tray data sheet. It is indicated, if the tray stacks centricity tolerances is exceeding the tolerances in the data sheet.

**JKT ASSESSMENT**
JKT is now assessing differences in the measurement results.

**JKT DETERMINATION OF TOLERANCE SPREAD**
With a very precise picture of how the different tray stacks variations are related to each other, it is now possible to utilize all the benefits by the use of: INTELLIGENT and TOLERANCE COMPENSATORY A2 tray dispensing technology. JKT can now specifically define how our A2 technology will be coping with the PLUS and MINUS tolerances. The tolerances our A2 Technology is designed to cope with, according LENGTH, WIDTH variations are now, by JKT, inserted in the sheet. In this example the tolerances are allowed to be, between PLUS 1.50 mm. and MINUS 1.00 mm.

**FINAL VERIFICATION**
It is now, in the GREEN cells of the column, verified that all the different trays can be denested in the one same SPEED-DISP A2 tray denester.

**JKT**
If the measured centricity tolerances of the respective tray stack are not within the JKT accepted LENGTH and WIDTH tolerances, this will be stated (as a red cell in the column). If a tray stack is not approved, at first JKT analyze it doesn't mean that the trays is of a poor quality, but only slightly passing tolerances, for which JKT can customize the PLUS / MINUS tolerances of the A2 tray denesting tool to compensate for, thus having this tray stack to fit in together with the eight others. If this can’t be done, it means that the centricity tolerances between the nine tray stacks after all, are too large. The tray is of course denestable in another SPEED-DFISP A2 set up.
The sheets with information of the centricity tolerances on the nine different tray stacks are documented (with reference to the JKT measurement device test set up, and the theoretical zero point).
One sheet for tray stacks LENGTH tolerances.
One sheet for tray stacks WIDTH tolerances.

The nine different trays.
All with differences and centricity variations,
Are denested in the one and same SPEE-DISP A2 tray denester.

Based on the evaluation of the results of all tray stacks measurements with great respect to the measurement differences, is it possible for JKT to design and calibrate the A2 denesting tool, so various trays with many and relatively large variations and differences, now can be denested flawless in the one and same Speed-Disp A2 tray denesting machine. This is possible because the JKT A2 denesting technology is working with intelligent and tolerance compensating tray denesting technology.