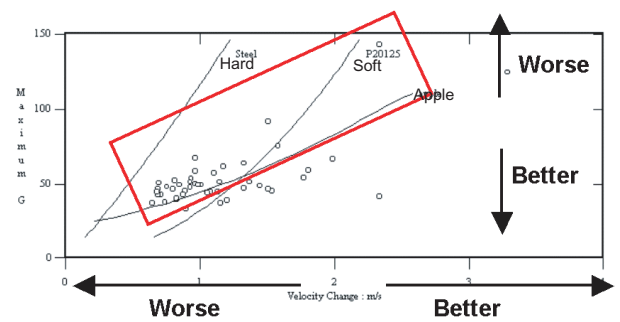




TECHMARK, INC.
technology from the ground up

5801 W. Mt. Hope Hwy. Lansing, MI 48917
ph (517) 322 0250 fax (517) 322 0470
techmark@techmark-inc.com www.techmark-inc.com

Collecting Impact Data and Interpretation of Detected Impacts made simple. All iPAQ's are preprogrammed and tested prior to shipping.



Scatter Graph

1. Make sure the IRD and the PocketIRD Handheld and/or PCIRD computer are fully charged as per the directions for each device. Make certain that the appropriate company has been selected with the PocketIRD and/or PCIRD software as well as the exact piece of equipment has been selected for the data that is about to be collected.

*****Read the Techmark IRD User's Reference Guide for comprehensive information*****

2. Start with the first segment of equipment. This segment begins and ends at points where you or your assistant have access to the flow of produce and can safely and carefully place the IRD in the flow and safely recover it from the flow downstream.
*****Use extreme caution to safely avoid contact with belts, chains and moving machinery parts*****
3. Real time recorded by the IRD is synchronized with the time on the PocketIRD and or PCIRD computer. Be sure not to drop or strike the IRD artificially from now until recording is stopped. If you do, then it is best to end the currently recording and restart another recording session.
4. Record real or elapsed times for the beginning and end of each pass and the times that the IRD passes any intermediate point(s) you can see. You may find it helpful to wait one minute or more between passes to help with data interpretation.
5. After collecting 6 to 10 passes of impact data for one segment, connect the IRD to the PocketIRD Handheld or PCIRD computer. Click on the "Retrieve Data" box or "Stop Record" box to end recording and automatically transfer the data from the IRD.
6. Apply or check labels immediately after transferring the data while the first segment run is fresh in your memory.
7. The "Scatter" graph (as shown above) which places the current data with data labels on a grid of Maximum G's versus Velocity Change (meters/second). When looking at the Scatter graph, there are existing lines that show one of several selectable produce-specific built-in damage boundaries (damage curve) and typical response curves for hard/steel and soft/padding.

*****Scatter Graph: It is best when impacts are below and to the right of the damage curve*****

8. On the above Scatter graph, no data points are near the hard/steel line; therefore this particular file had no impacts on bare, solid metal surfaces. Even small, low G impacts on bare, unprotected steel can cause sever damage to many types of produce. This is why the "Apple" damage curve is sloped from the lower left, where a low G impact has caused 10% damage to the upper right where a higher G impact is required to cause the same amount of damage. This is because at the higher velocity changes (softer surfaces) impacts have to be larger (higher maximum G) to cause the same amount of damage. Points above the damage curve will have a greater than 10% likelihood of causing bruise damage. Points below the damage curve have less than a 10% likelihood of causing bruise damage.
9. Using the Scatter graph, one can identify the impacts that are the most serious and fix those parts of the system first. In the above Scatter graph, the most serious impacts are those inside the square which are above the apple damage curve. With the data labels, one can immediately identify and fix these known areas.

Congratulations, you just mastered the interpretation of the Techmark IRD Data!