Test & Test Consumables Market Report

Ira Feldman
Feldman Engineering Corp.

June 24, 2020 webinar
• Preeminent event for **test consumables, test cell integration, and test operations**.
• Expanded scope from packaged semiconductor functional / “final” test and burn-in to encompass all **practical aspects of electronics testing** including validation, advanced packaging testing, system level test, module test, and beyond to finished product test.

**Connecting electronic test professionals to solutions**

www.testconx.org
SARS-CoV2
**White-Collar Companies Race to Be Last to Return to the Office**

Google, Facebook, Amazon, Capital One and others are extending work-from-home policies to September and sometimes far beyond.

**THE WALL STREET JOURNAL.**

**CIO JOURNAL**

**Employers Face Shortages of Tech Gear as Coronavirus Forces Shipment Delays**

The technology that has enabled the sudden shift to remote work is in short supply.
Facebook Is Paying Workers to Move Closer to the Office

BY KARA BRANDEISKY DECEMBER 17, 2015

Frank Gehry designed ~ $1B West Campus

FACEBOOK SAYS IT WILL PERMANENTLY SHIFT TENS OF THOUSANDS OF JOBS TO REMOTE WORK

Up to half of employees could work remotely within five to 10 years, CEO Mark Zuckerberg says in an interview

By Casey Newton | @CaseyNewton | May 21, 2020, 1:15pm EDT
OpenVault Broadband Insights Report (OVBI)

“COVID-19 IMPACT: Broadband usage surges 47% IN Q1, nearing YE2020 expectations, with exponential rise in >1TB/2TB power users”

Data Usage % Growth YOY

Source: OVBI Broadband Insights Report Q120
Coronavirus Won’t Kill Leisure Or Business Travel, But It Will Change Them Significantly, Perhaps Forever

Dan Reed  Senior Contributor  Aerospace & Defense
I write about airlines, the travel biz, and related industries

The Critical Points: What does the future of business travel look like?

Richard Kerr
Apr 3, 2020
When Will You Travel? It depends...

- **On airplanes:**
  - Now: 7%
  - Summer: 12%
  - Fall: 13%
  - Winter: 15%
  - Next spring: 16%
  - +1 year: 37%

NY Times: 511 Epidemiologists; 6/8/2020

Overall exposure to travelers and boarding the flight are driving most of travelers’ anxiety.

<table>
<thead>
<tr>
<th>Journey Anxiety, T2B, % of respondents³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using restroom in-flight</td>
</tr>
<tr>
<td>In-flight food/beverage</td>
</tr>
<tr>
<td>Baggage claim</td>
</tr>
<tr>
<td>Retrieving your bag</td>
</tr>
<tr>
<td>Overall exposure to travelers</td>
</tr>
<tr>
<td>In-flight entertainment</td>
</tr>
<tr>
<td>Taking bags &amp; deplaning</td>
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<tr>
<td>Going through security</td>
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<tr>
<td>Traveling to gate</td>
</tr>
<tr>
<td>Checking in/dropping off bags</td>
</tr>
<tr>
<td>Leaving the airport</td>
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<tr>
<td>Getting to the airport</td>
</tr>
</tbody>
</table>

McKinsey & Company – May 2020 survey, n=455
# COVID-19 Implications

<table>
<thead>
<tr>
<th>Area</th>
<th>Short/Mid Term</th>
<th>Longer Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work from Home &amp; Distance Learning</td>
<td>Continued as long as required / practical</td>
<td>Hybrid model – in office / on campus part time</td>
</tr>
<tr>
<td>Offices</td>
<td>If reopened – short term modifications for isolation</td>
<td>End of open offices? Hoteling/hot desks? Smaller office campuses</td>
</tr>
<tr>
<td>Meetings</td>
<td>Very selective as to size, duration, and necessity of in person</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Otherwise via web/conference call</td>
<td></td>
</tr>
<tr>
<td>Business Travel</td>
<td>None except extremely critical (&quot;line down&quot;)</td>
<td>Heightened scrutiny (Is it essential? No other way?) with reduced budgets</td>
</tr>
<tr>
<td>Test Floors</td>
<td>Restricted to absolute essential employees</td>
<td>Increased automation</td>
</tr>
<tr>
<td></td>
<td>Greater emphasis on remote test development &amp; debug</td>
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</table>

➔ Greater demand for computers, mobile devices, bandwidth  
➔ Growth for (select) semiconductors  
➔ Accelerated 5G rollout
Companies need to think and act across five horizons.

The five horizons

1. Resolve
   Address the immediate challenges that COVID-19 represents to institution’s workforce, customers, technology, and business partners

2. Resilience
   Address near-term cash-management challenges and broader resiliency issues during virus-related shutdowns and economic knock-on effects

3. Return
   Create detailed plan to return business to scale quickly as COVID-19 situation evolves and knock-on effects become clearer

4. Reimagination
   Reimagine the next normal: what a discontinuous shift looks like and implications for how institutions should reinvent

5. Reform
   Be clear about how regulatory and competitive environments in industry may shift

Future Food Automation?

CafeX

Bloomberg.com
creator.rest

https://www.youtube.com/watch?v=CbL_3le40qc

techcrunch.com

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Test & Test Consumables Market Report
More ‘Personal’?

Rethink Robotics
https://www.youtube.com/watch?v=rkai5AcyG8M
Chitty Chitty Bang Bang (1968)
Panasonic Shampoo Robot (2012)
Test and Burn-In Socket Market

VLSI Research 2019

Test Sockets
Burn-in Sockets

Revenue, $M


6.3% CAGR
4.1% CAGR
7.2% CAGR
Short Term Year Over Year (YOY) Change

VLSI Research 2019

Test ConX

Test & Test Consumables Market Report
# Top Test & Burn-in Vendors 2019

<table>
<thead>
<tr>
<th>Rank</th>
<th>2018 Overall</th>
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<tr>
<td>1</td>
<td>Yamaichi Electronics</td>
</tr>
<tr>
<td>2</td>
<td>Enplas</td>
</tr>
<tr>
<td>3</td>
<td>ISC</td>
</tr>
<tr>
<td>4</td>
<td>Smiths Interconnect</td>
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<td>5</td>
<td>LEENO Industrial</td>
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<td>WinWay</td>
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VLSI Research 2018 & 2019

Test & Test Consumables Market Report
# Top Test & Burn-in Vendors 2019

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<td>Micro Contact Solution</td>
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<td>Loranger</td>
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VLSI Research 2019
Conclusions

• Dynamic Environment
  – Make the best decisions you can
  – Tactics – focus on what you can do
  – Strategy – plan for the future

• Adjust & Adapt
  – Update Tactics & Strategy as required
“Engineered Solutions”
You can’t change the way the wind blows but you can adjust your sails

- Cora L.V. Hatch 1859/paraphrased
• Socket Market Data courtesy of VLSI Report
  – Thank you Lin Fu & John West
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