Looking back to 2014, the Tesat-Spacecom Parts Agency underwent some organizational changes. These activities were needed to reflect the reached growth of the past years and to be well-prepared for the future. The Parts Agency now offers further enhanced world leading parts procurement services, project management, as well as tools and methods to support its global customer base. In the next editions of this Newsletter we will inform about these improvements.

In addition in July 2014 the Airbus Defence and Space reorganization took place. As a result, the Airbus Defence and Space EEE Center was created, comprising the engineering, quality assurance, procurement and internal interface teams under one roof.

All well-known services and activities for our Parts Agency customers are – as before – provided by the staff of the Tesat system in Backnang. In addition, when requested, an access is possible to further experts of the EEE Centre. Such interfacing is based on SLAs and where needed NDAs.

Dr. Frederik Küchen became the Head of the Tesat Parts Agency, Dr. Martin Veith was appointed as Head of the EEE Centre. The year 2014 overall was a very successful year. Besides servicing customers via direct contract, also major new contracts as Central Parts Procurement Agent (CPPA) in key ESA programs have been awarded to us:

End of 2014 the procurement of EEE components for the European Service Module of the new Orion Multi-Purpose Crew Vehicle (MPCV) started under the control of Tesat’s Parts Agency.

At the beginning of 2015 two more ESA projects have been awarded to be procured as CPPA through Tesat-Spacecom Parts Agency:

**EUCLID** – an ESA mission to map the geometry of the dark Universe. Satellite prime is Thales Alenia Space in Italy, as well as

**JUICE** – JUpiter ICy moons Explorer, this is the first large-class mission in ESA’s Cosmic Vision 2015-2025 program. Planned for launch in 2022 and arrival at Jupiter in 2030, it will spend at least three years making detailed observations of the biggest planet in the Solar System and three of its largest moons, Ganymede, Callisto and Europa.

EUCLID and JUICE are two challenging scientific ESA missions and we are proud to be selected. To be part of these missions will reinforce our competence as one of the world leading Parts Agencies.

For any questions please contact Dr. Frederik Küchen.

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Phone: +49 (0) 7191 - 930 - 2414
Tesat-Spacecom GmbH & Co. KG and its technical departments regularly accomplish constructional analyzes to verify innovative components and technologies for usability within the application of Tesat equipment. In the course of the Parts Agency we are in the unique position to provide technical support as well as comprehensive documentation from detailed datasheets to construction analyses and application notes. As part of our Parts Agency services, we are able to share such information with interested customers.

Exclusively for Europe Tesat Parts Agency can offer EM Samples as well as EM Boards of the new EPPL / QPL listed and fully JAXA qualified Avio POL Converter for on hands testing purposes.

The following devices and EM Boards are available:

<table>
<thead>
<tr>
<th>Part Type</th>
<th>Preset output Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAXA2020/01011D8CR02-SAPJ-15S30</td>
<td>1,5 Volts</td>
</tr>
<tr>
<td>JAXA2020/01011D8CR00-SAPJ-18S30</td>
<td>1,8 Volts</td>
</tr>
<tr>
<td>JAXA2020/01011D8CR04-SAPJ-33S20</td>
<td>3,3 Volts</td>
</tr>
</tbody>
</table>

For more information please contact:

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Sascha Kraft, Sascha.Kraft@tesat.de  
Phone: +49 (0) 7191 - 930 - 2440
Cavity-type high reliability EEE components have historically demanded the highest possible levels of hermeticity. The "hermetic" seal made of glass, ceramic and/or metal was designed to keep moisture out of the package and thereby avoid any failures caused by condensed water vapor inside the cavity\(^{1}\). Most military and space systems are designed to last 10-20 years and therefore a "leaky" package would represent an unacceptable reliability risk\(^{1}\). In our EEE Labs we perform Helium fine leak testing, which uses Helium as tracer gas.

Recent developments in test and assessment
To prevent water condensation inside the package it is required to keep the amount of moisture below 5,000 ppm (parts per million). Then the water vapor dew point is below the freezing point and any moisture that would condense out inside the package would be in the form of ice crystals and not be available for corrosion processes\(^{1}\). The lower the leak rate limits are the fewer water vapor will penetrate into the package. To pursue this, the leak rate limits for fine leak testing in the MIL Standards were tightened. This led to a serious change in the test process; for example, it is now necessary to take into account effects like Helium surface sorption and system noise background. Through that the Helium fine leak test transformed from a “push one button test” to a more complex test procedure.

Coping with this challenge
To ensure that the new requirements are met, we consider different aspects of the Helium fine leak testing method:
* measuring at an adequate leak rate scale (E-1 atm*cc/sec (He) or E-1 atm*cc/sec (He) )
* working with adequate pressurization times (up to three days)
* knowing the internal cavity volumes
* calculating the "Howell-Mann-Equation"

The Howell-Mann-Equation relates pressurization time and cavity volume with the measured Helium leak rate and allows determining test parameters which lead to significant test results.

Our Expertise
Since their introduction in 2012/2013 we have gathered two years experience with the new seal test requirements. In 2013/2014 we performed leak test on 562 DPA lots (usually three test samples per lot), which include a broad range of 109 different package geometries. We have discovered fine leak failures that would not have been discovered using the old limits. This gives us confidence that we have successfully adapted to the new test requirements.

Literature

For more details, contact Alexander Augenstein via mail: Alexander.Augenstein@tesat.de

Fine leak test equipment used in EEE labs. MS-50 HS dry from VIC.
### Dates

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.-18. Sept. 2015</td>
<td>RADECS 2015, Moscow, Russia</td>
</tr>
<tr>
<td>11.-12. Nov. 2015</td>
<td>Workshop „Herausforderung Weltraum“, Fraunhofer INT, Euskirchen, Germany</td>
</tr>
</tbody>
</table>

Your Tesat Parts Agency