

VT ElektroPlast VT Battery

ONE COMPANY – INFINITE POSSIBILITIES

—
Engineering

TECHNOLOGY

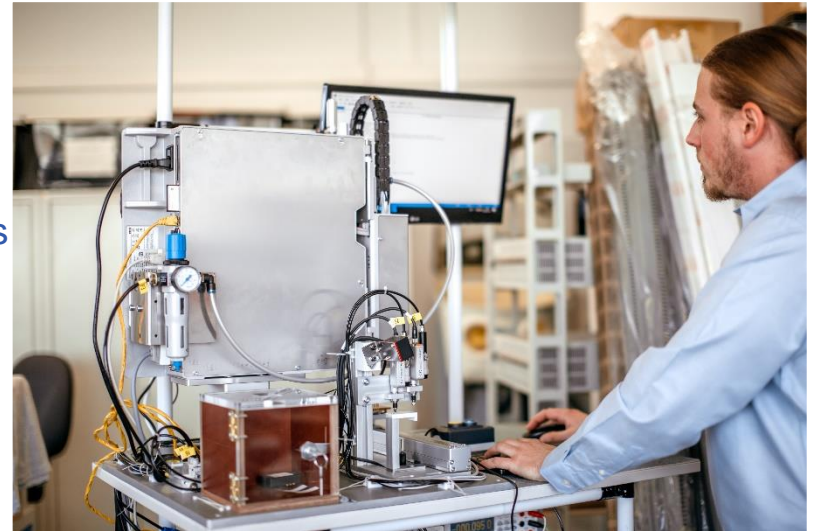
DYNAMISM

PROGRESS

STABILITY

WIDE RANGE OF ENGINEERING SERVICES

- feasibility studies, DFM analysis
- product development with the customer (early involvement)
- creating prototypes (Objet30 3D printer)
- tool management
- automation: assembly lines, single-purpose machines
- industry 4.0
- 22 engineers, 4 technicians, 9 designer stations
- CAD softwares:
 - mechanical: Creo 5.0, NX10, SolidEdge 10
 - electronic: E-Plan, Lab View, Protel, WinSTEP, Altium



NPI functions



NPI CAPABILITIES AND SERVICES



- product design
- sampling
- benchmarking
- 3D scanning
- feasibility studies
- functional model
- DFMEA
- mould filling study
- electronic design
- 3D printing, prototyping (Objet30 printer)
- tool management
- assy line design
- tester design
- traceability system
- producing testers
- assy line balance - lean
- infrared camera
- PFMEA
- tests (kitchen, lifetime, durability, climatic)
- measuring and capability reports
- product development study
- FMEA, control plan
- Flow chart
- RoHS - XRF tester



IDEA

RESEARCH

DESIGN & DEVELOPMENT

INDUSTR.

PRODUCT RELEASE

PRODUCTION

PRODUCT

- market research
- demand map

- concept design
- product design
- ergonomic test

- form design
- function overview
- prototyping

- CE Conformity
- approbation certificates (TÜV, VDE, KEMA, GOST-R, CCC)
- RoHS
- drop test
- vibration test
- salt-spray test

Provided by external partners



PRODUCT DEVELOPMENT

Feasibility study

- [Power tool 36V battery pack](#)

Product modelling

- [Power tool 36V battery pack](#)

Participation in product design

- [Jug blender](#)
- [Battery-operated ear cleaner](#)
- [ATM battery pack](#)
- [Multi chopper adapter for hand blender](#)
- [Hair dryer impeller](#)

Product optimization

- [Mini generator](#)
- [Hand blender](#)

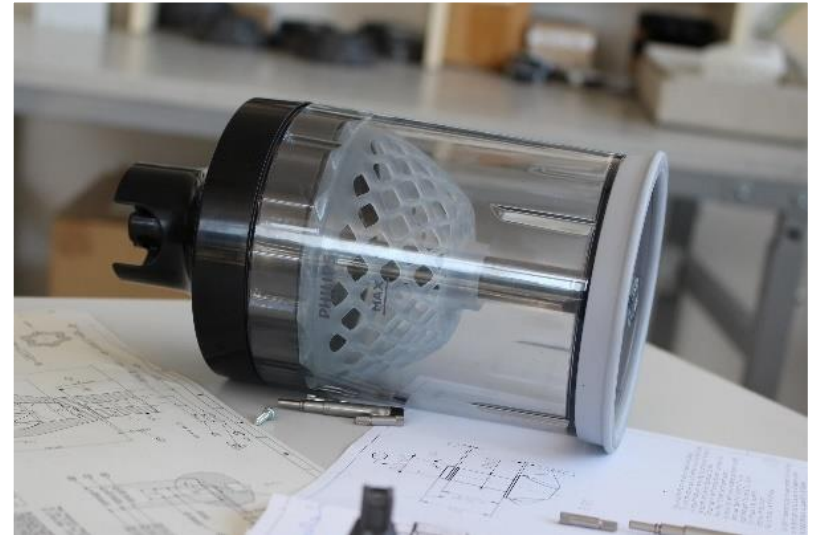
Additional functions and accessories

- [Hand blender accessories](#)

CREATING PROTOTYPES

Available prototyping methods:

- vacuum-casting
- stereolithography (SLA)
- selective laser sintering (SLS) plastic, metal
- fused deposition 3D modeling (FDM)
- objet/polyjet
- silicon tool/form
- plastic soft tool
- sheet metal parts
- cut parts
- customized rubber parts



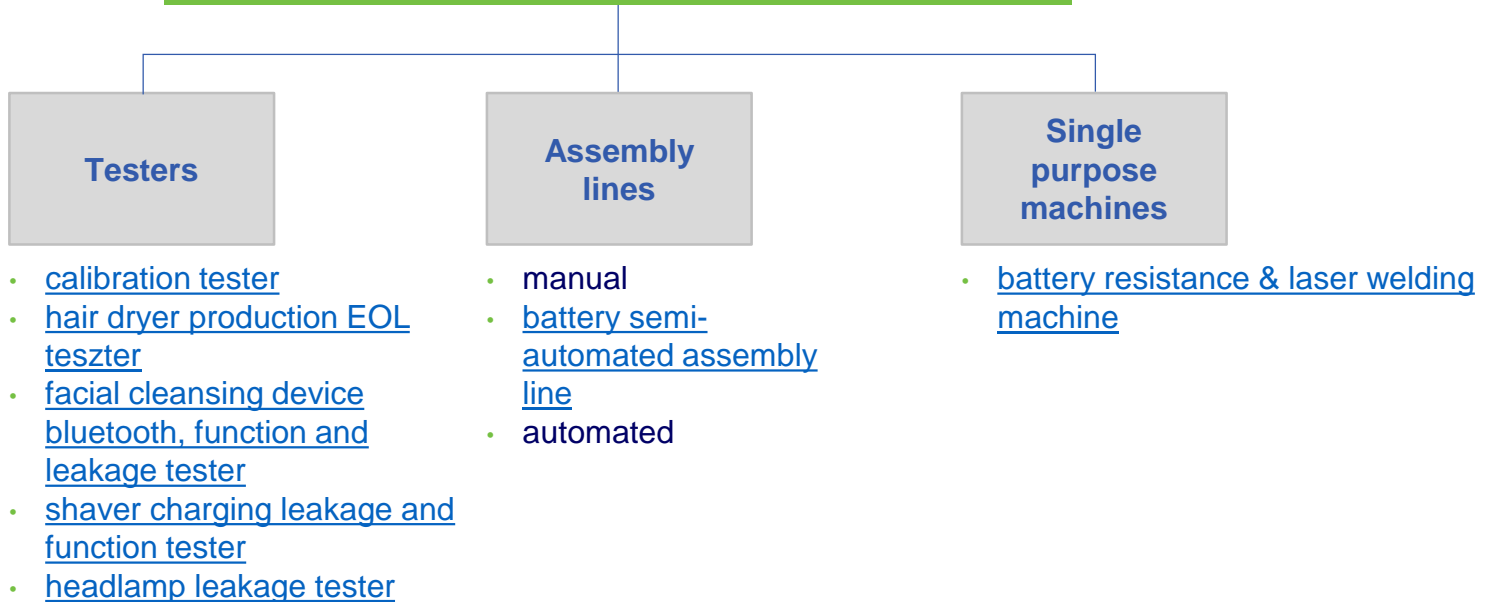
TESTS

- product approbation – EMC, RoHS, etc.
- drop / vibration test
- horizontal impact test
- stacking test (with dynamic/static loads)
- flammability test
- chemical resistance /compatibility tests
- environmental resistance tests
- ageing test
- salt-spray test
- climatic, temperature cycle & shock tests
- moisture test
- hardness, scratch resistance tests
- battery specific tests

Periodic in-house tests

- kitchen test
- durability test
- lifetime test
- high-voltage test
- leakage test
- function test
- switching test
- electronic data collection

Industrialization



ASSEMBLY LINES

- assembly lines
 - manual
 - partly automated
 - fully automatized
- repairing stations
 - for mass production
 - for low series production



AUTOMATIZATION & SINGLE PURPOSE MACHINES

- automation of assembly
- testing of certain function(s)
- reliable quality
- stable output
- engineering support for repair
- industry 4.0



TOOL MANAGEMENT

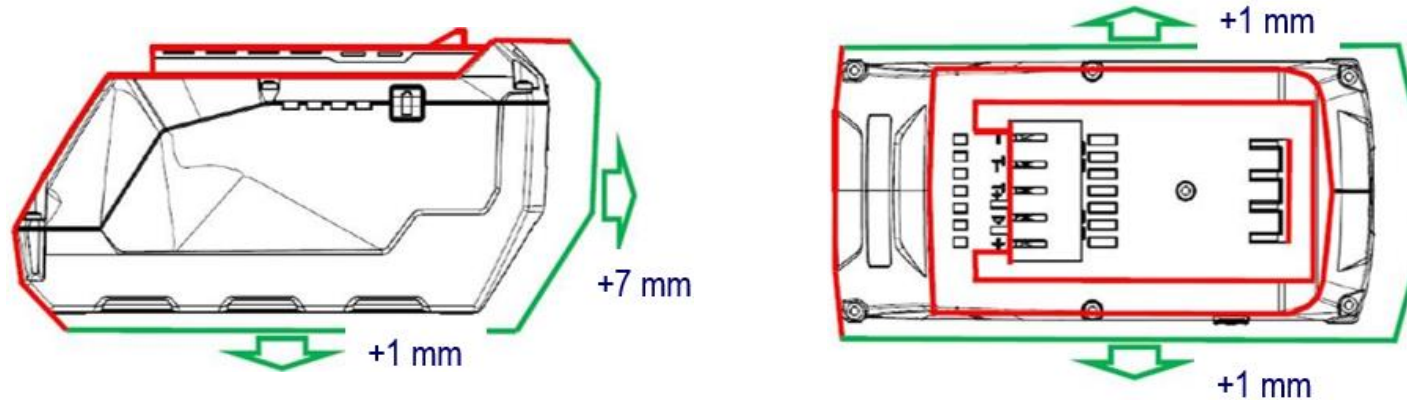
- internal tool workshop
 - preventive maintenance
 - modifications
 - renewals
- NPI tool management
 - competitive prices: EU & Far-East toolmakers
 - complete administration from the model part to tool approval
 - management of tool modification (including documentation update)
 - continuous follow-up of suppliers
- external partners
 - new plastic
 - rubber
 - metal tools



POWER TOOL 36V BATTERY PACK PROJECT

Description:

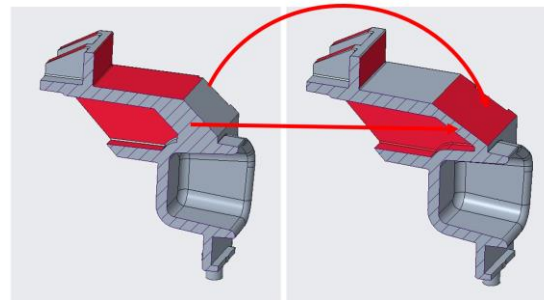
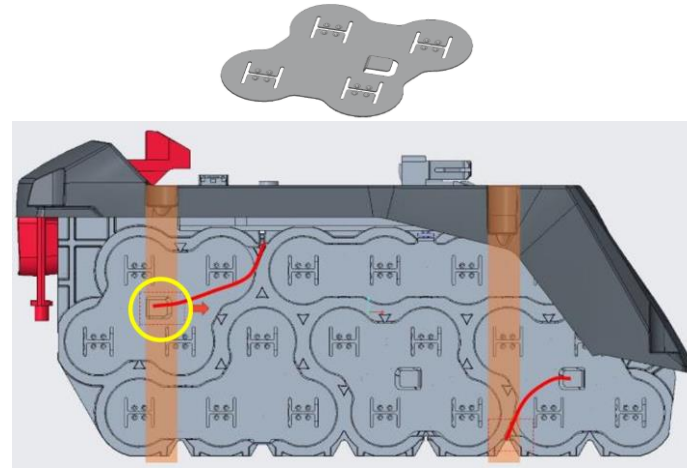
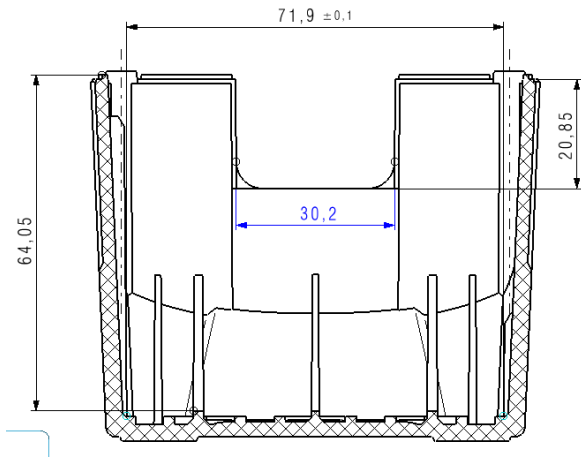
Re-design the powertool battery pack existing on the market with 20700 cells for the assembly of 21700 cells, functional strengthening of the plastic housing, design of new accessory component



- product conception suggestion, 3D planning, 2D drawings
- function plan, prototype making, DFM, DFMEA, PFMEA, tooling, sample production
- product tests, release, production

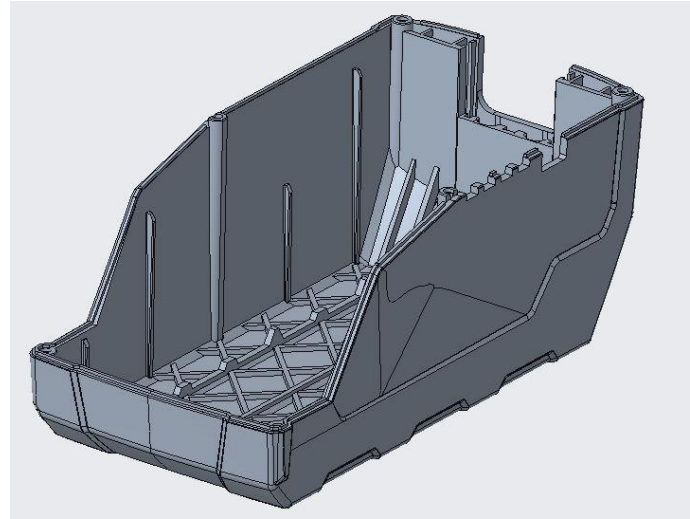
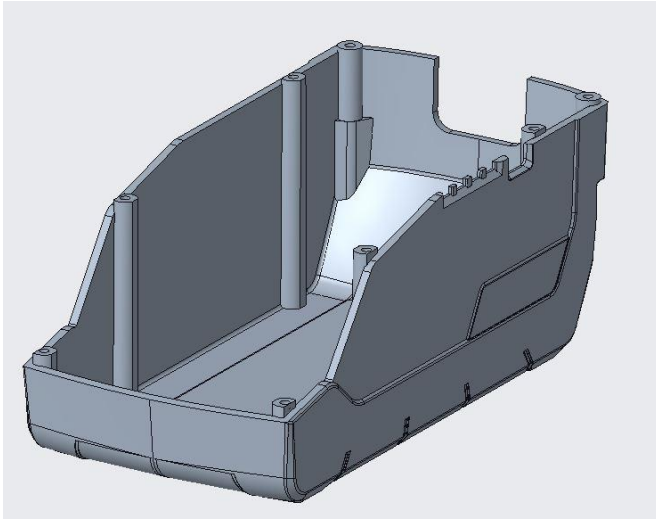
POWER TOOL 36V BATTERY PACK PROJECT – PRODUCT DEVELOPMENT

- Designing metal parts (Lead plates etc.)
- Tolerance calculation
- Optimization of the wall thickness



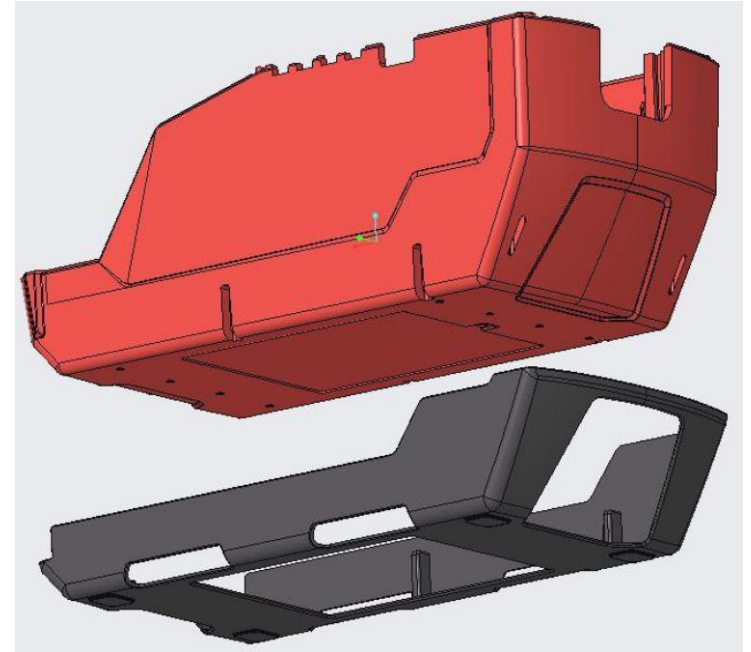
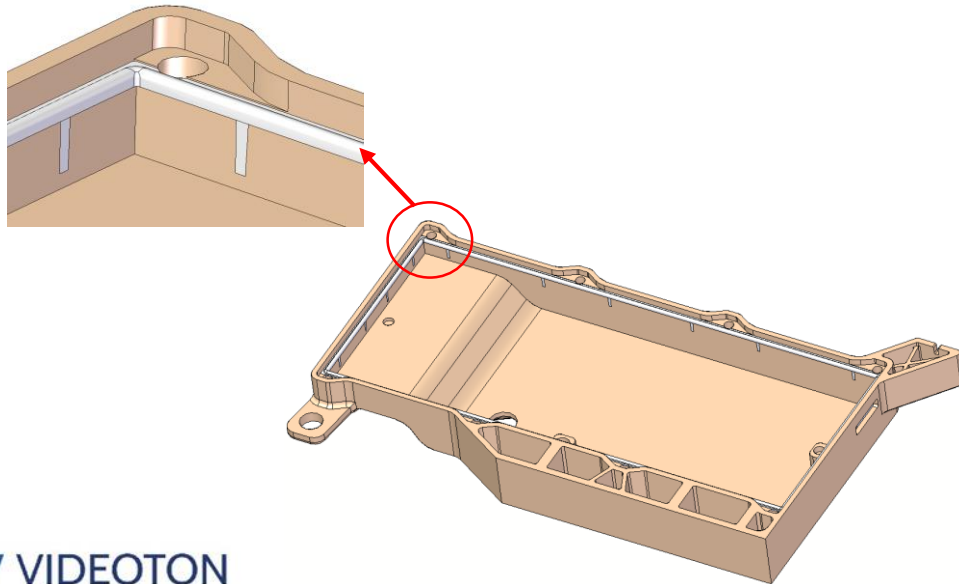
POWER TOOL 36V BATTERY PACK PROJECT – PRODUCT DEVELOPMENT

- Designing stronger plastic parts



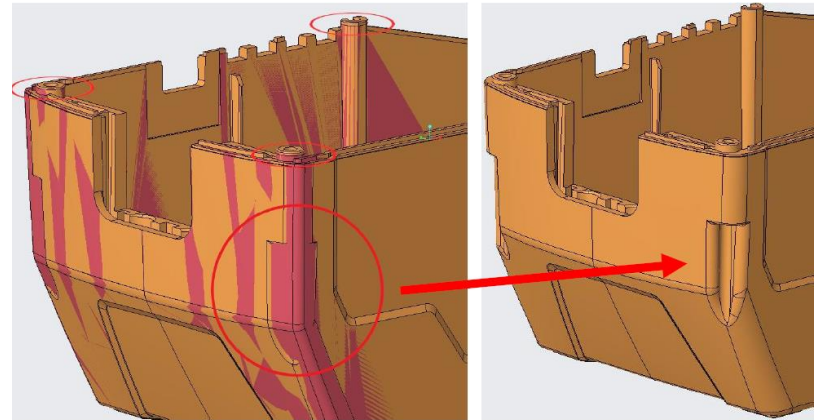
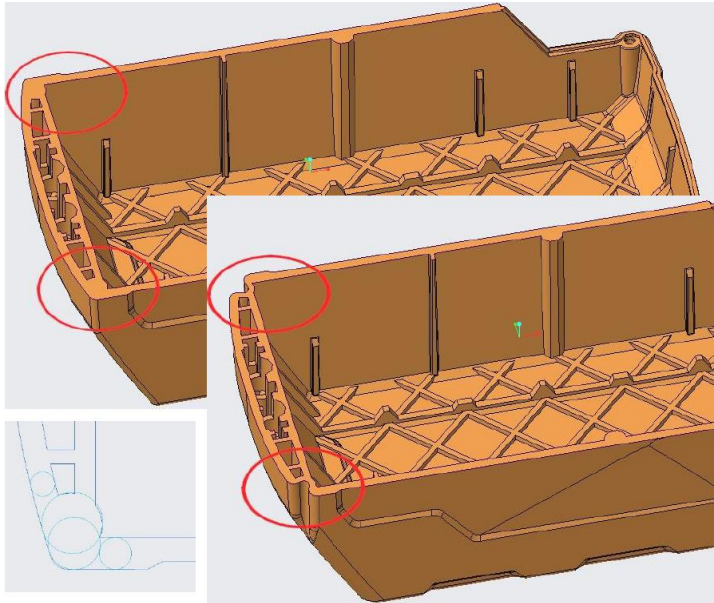
POWER TOOL 36V BATTERY PACK PROJECT – PRODUCT DEVELOPMENT

- Designing soft parts (TPU, TPE, TPS)
- Designing 2k moulded parts



POWER TOOL 36V BATTERY PACK PROJECT – PRODUCT DEVELOPMENT

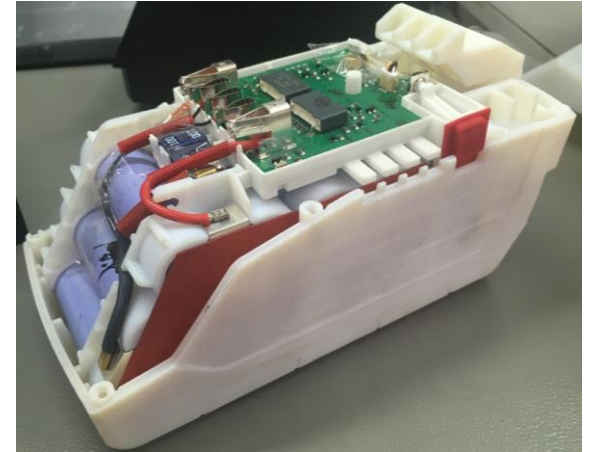
- Designing for moulding
- Designing for assembly



POWER TOOL 36V BATTERY PACK PROJECT – PROTOTYPING

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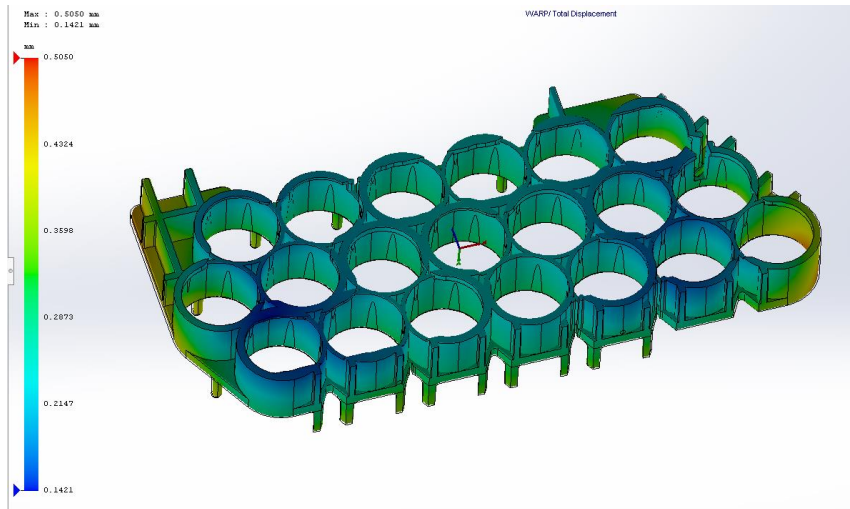


POWER TOOL 36V BATTERY PACK PROJECT – TOOLING

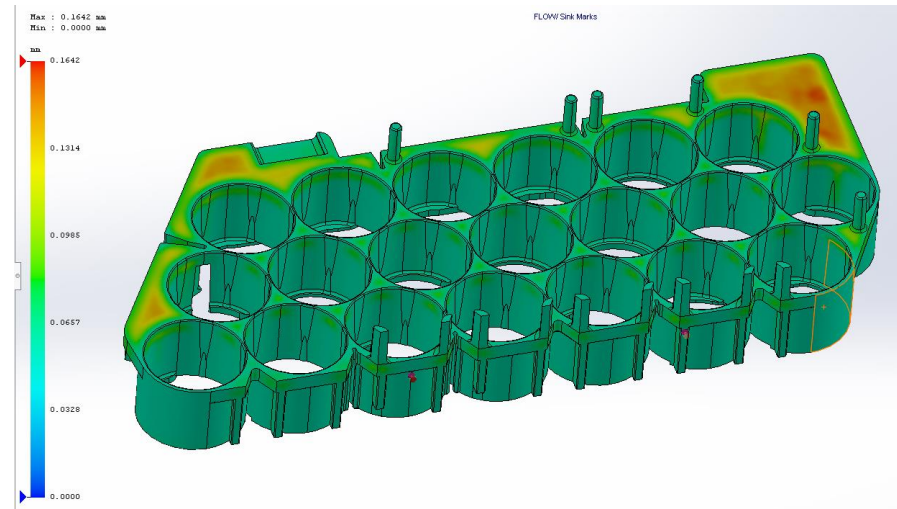
New product introduction in pictures:

4/3 Simulation of the plastic moulded components, DFM analysis, Tooling

Warpage / Total Displacement



Sink marks

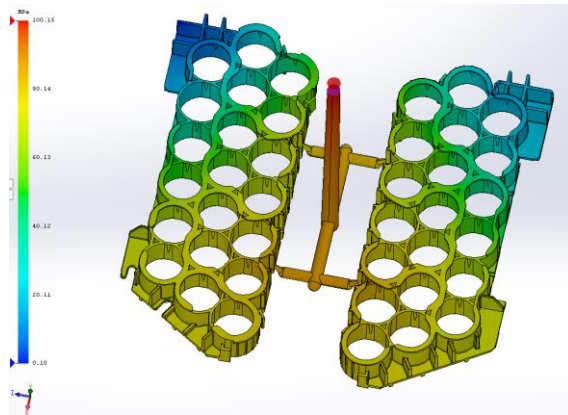


POWER TOOL 36V BATTERY PACK PROJECT – TOOLING

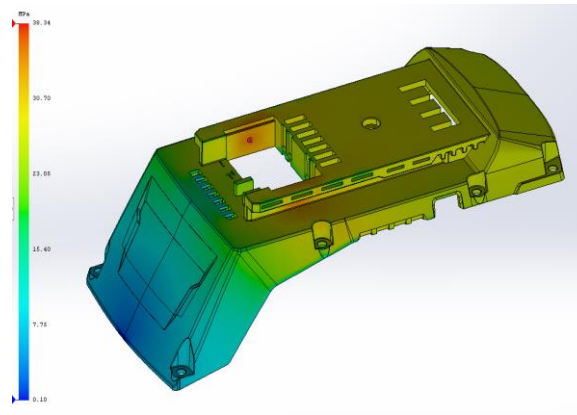
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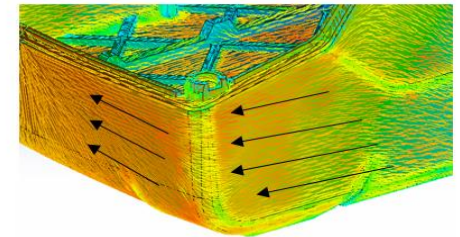
Injection point/gate



Injection point



Material flow analysis



COOPERATION WITH HUNGARIAN UNIVERSITIES

Budapest University of Technology and Economics



- design plans
- ergonomic evaluation
- hydrodynamic evaluation

University of Dunaújváros



- polymer technical assessments (by Moldex 3D software)

John Von Neumann University – GAMF Faculty of Engineering and Computer Science NEUMANN JÁNOS EGYETEM

- cooperation in tenders (market R+D tender)
- battery welding optimisation, analysis, technological development
- metallographic examinations
- testing of plastics (MFI/MVR, TG examination)

COOPERATION WITH HUNGARIAN UNIVERSITIES

University of Pécs – Faculty of Engineering and Information Technology



Pécsi Tudományegyetem
Műszaki és Informatikai Kar

- cooperation in dual engineer training

Széchenyi István University (Győr)



- external product approval assessments (packaging of plastic and metal parts, finished goods)
- climatic, salt-spray and ageing tests

Hungarian University of Agriculture and Life Sciences – Kaposvár Campus



- comparison of household devices with different technical content from the aspect of influence for raw materials (colour, flavour, fragrance, content)

COOPERATION WITH EXTERNAL LABS

TÜV Rheinland



- extensive association with the company
- total RoHs and REACH inspections
- analysis of components food contact components
- continuous communication in connection with approval process topics (in product development stage)
- tests in connection with product validation (climate-,vibrating-,battery electric-,combined tests...)
- UN38-3 / IEC 62133 tests and issue of certificates
- CE marking

THANK YOU FOR YOUR KIND ATTENTION!



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