TABLE OF CONTENTS

ANNUAL REPORT 2020/21

2	Foreword
4	Table of contents
	Fraunhofer IKTS in profile
6	Portrait
8	Organizational chart
10	Fraunhofer IKTS in figures
13	Board of trustees
14	New Fraunhofer IKTS sites
10	Potencial's
19	Retrospective
24	Corona research at Fraunhofer IKTS
26	Highlights from our business divisions
26	migningitis from our business divisions
	Materials and Processes
28	Novel hard phases for hardmetals, MMC and thermal spraying
29	Synthesis reactor for oxide nanopowders
30	Wear-reducing aluminum-rich CVD-TiAlN layers
31	Freeform injection molding – ceramic injection molding with single-use molds
32	Sialons – a special ceramic produced with less effort
	Mechanical and Automotive Engineering
33	Turbine components made of silicon nitride
34	CompWatch – automated monitoring of compressors
35	Fully automated permporometry plant for membrane characterization
	Electronics and Microsystems
36	Stress effects in microelectronic devices studied with indentation
37	Photoimageable pastes for high-frequency applications
38	Printed flexible magnetic field sensors using cost-efficient materials
39	Titanium oxides – electrical all-rounders
I	Energy
40	Planar Na/NiCl ₂ battery cells – powerful stationary energy storage
41	Energetic and economic evaluation of power-to-X processes
42	Development of processes for sulfide electrolyte-based solid-state batteries
43	Electron-emitting ceramics for satellite propulsion
44	Process development for the commercial production of SOC cells and stacks
45	Green revolution on the high sea – EU project HyMethShip
46	Sustainable gas diffusion electrode for alkaline energy converters
47	Hydrogen separation from natural gas with carbon membranes

Environmental and Process Engineering 48 Unveiling the Fischer-Tropsch mechanism through spatially resolved reaction 49 Smart pump systems for mixing of biogas reactors 50 Low-emission ethanol fireplaces Bio- and Medical Technology 51 Osseointegrative surface design for ceramic finger joint implants 52 Calcification of heart valves – in-vitro characterization and prevention 53 Evaluation of biological 3D printing processes using OCT Water 54 Water purification processes with sound and pressure – Attract Group KAV-AQUA 55 Electrochemical fabrication of nanoporous aluminum oxide membranes 56 Micropollutant removal by ceramic membranes – project PharMem 57 Comparison of methods for herbicide removal from drinking water in pilot scale 58 Thermally coated erosion protection layers for wire-wrapped sand screens Materials and Process Analysis 59 Studies on osteoporosis prevention: ERC Synergy Grant 4D+ nanoSCOPE 60 nanoGPS^R – an enabling technology for correlative nanoanalytics 61 Material weathering under real conditions in the marine environment 62 Optimization of sintering processes Non-destructive testing and monitoring 63 OCT for the characterization of 3D-printed ceramic objects 64 Optical in-line monitoring of high-performance ceramics production Charge-state monitoring of Lithium-ion batteries with guided waves 66 Optimizing the filling of Lithium-ion battery cells with in-line methods Multidimensional dosimetry for process control in electron beam irradiation 68 Cooperation in groups, alliances and networks 73 Names, dates, events 74 Events and trade fairs in 2021 76 How to reach us