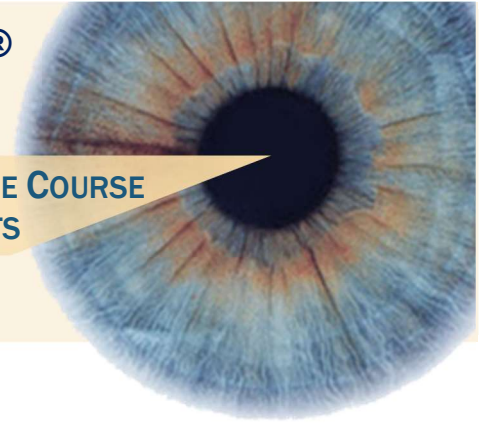


Market Scope®

CHARTING THE COURSE
OF THE EYE CARE MARKETS



Products

E

Y

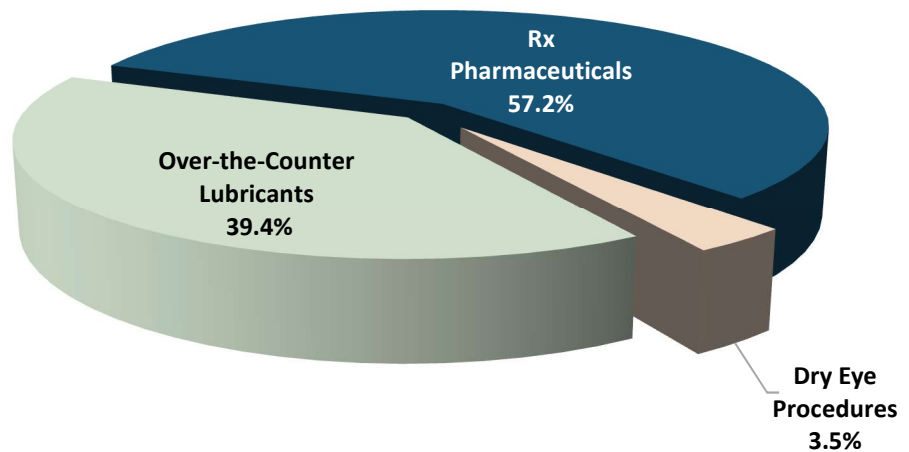
E

R

Y

D

2017 Dry Eye Products Report: A Global Market Analysis for 2016 to 2022



December 2017

9859 Big Bend Blvd., Suite 202
Saint Louis, MO 63122
Phone: (314) 835-0600
Fax: (314) 835-0606
www.market-scope.com

TABLE OF CONTENTS

INTRODUCTION	8
<i>Scope</i>	8
<i>Methodology</i>	8
About the Author	9
The Report at a Glance	10
EXECUTIVE SUMMARY	11
<i>The Challenges of Dry Eye Disease</i>	13
Dry Eye Products Market Segments	14
<i>Market Competitors</i>	16
DRY EYE OVERVIEW	18
Normal Tear Function	19
Causes of Dry Eye	22
DEWS Classification of Dry Eye	23
<i>Tear Deficiency</i>	23
<i>Non-Sjögren’s Tear Deficiency</i>	23
<i>Sjögren’s Syndrome Tear Deficiency</i>	24
<i>Evaporative Dry Eye</i>	24
The Role of Inflammation	26
Hormones and Dry Eye	26
LASIK and Dry Eye	28
Notes on Blepharitis	29
<i>Anterior Blepharitis</i>	29
<i>Posterior Blepharitis</i>	29
CARE FOR DRY EYE WORLDWIDE	30
Ophthalmologists	30
<i>Population per Ophthalmologist</i>	30
Optometrists	32
Dedicated Dry Eye Treatment Centers	32
DRY EYE ORGANIZATIONS	35
<i>Sjögren’s Syndrome Foundation</i>	35
<i>Tear Film and Ocular Surface Society</i>	35
<i>Cornea Research Foundation of America</i>	35
DIAGNOSIS OF DRY EYE	36
<i>Symptoms Versus Objective Signs</i>	36
Dry Eye Questionnaires	37
Conventional Approaches to Dry Eye Diagnosis	38
<i>Diagnostic Staining</i>	38
<i>Tear Break-up Time (TBUT)</i>	39
<i>Schirmer Test</i>	40
<i>Effectiveness of Conventional Dry Eye Tests</i>	40

<i>Clinical Examination</i>	41
Newer Approaches to Dry Eye Diagnosis	42
<i>TearLab Osmolarity System</i>	42
<i>J&J Vision (formerlyTearScience) LipiView Ocular Surface Interferometer</i>	43
<i>J&J Vision LipiScan Meibomiam Imaging</i>	43
<i>Oculus Keratograph 5M</i>	44
<i>RPS/Nicox InflammDry Detector</i>	44
<i>Tomey Tear Stability Analysis System (TSAS)</i>	45
<i>Advanced Tear Diagnostics TearScan MicroAssay System</i>	45
<i>Bausch + Lomb (Valeant) Sjö Diagnostic Panel</i>	45
<i>Other New Approaches</i>	46
<i>DEWS on Dry Eye Diagnostics</i>	46
<i>The Dry Eye Diagnostic Market</i>	47
PREVALENCE OF DRY EYE	48
<i>Beaver Dam Eye Study</i>	48
<i>Salisbury, MD, Study</i>	49
<i>Extension Blue Mountains Eye Study</i>	49
<i>Melbourne Visual Impairment Project</i>	49
<i>The Canadian Dry Eye Epidemiology Study</i>	50
<i>Women, Menopause, Menopausal Hormone Therapy</i>	50
<i>Physician's Health Studies</i>	51
<i>Shanghai, China, Study</i>	51
<i>Additional Prevalence Studies</i>	51
<i>Estimating the Prevalence of Dry Eye Syndrome</i>	53
<i>Worldwide Dry Eye Populations</i>	56
<i>Dry Eye Populations and Contributors by Country/Category</i>	56
<i>United States' Dry Eye Contributors</i>	56
<i>Western Europe's Dry Eye Contributors</i>	58
<i>Japan's Dry Eye Contributors</i>	59
<i>Other Wealthy Nations' Dry Eye Contributors</i>	60
<i>China's Dry Eye Contributors</i>	61
<i>India's Dry Eye Contributors</i>	62
<i>Latin America's Dry Eye Contributors</i>	63
<i>Rest of World's Dry Eye Contributors</i>	64
<i>Dry Eye Severity</i>	65
<i>Treatment Frequency</i>	65
<i>Treated versus Untreated Dry Eye</i>	67
OVERVIEW OF TREATMENT AND PRODUCTS	69
<i>Products and Market Segments</i>	71
DRY EYE RX PHARMACEUTICAL PRODUCTS	72
<i>Anti-inflammatory Agents</i>	72
<i>Allergan: Restasis</i>	73
<i>Shire: Xiidra</i>	76
<i>Santen: Ikervis</i>	78
<i>Corticosteroids</i>	79

<i>Nonsteroidal Anti-inflammatories</i>	80
Secretagogues	81
<i>Santen: Diquas</i>	81
<i>Otsuka: Mucosta Ophthalmic</i>	83
Viscoelastic Lubricants	85
<i>Santen: Hyalein</i>	85
<i>TRB Chemedica: Vismed</i>	86
<i>Generic Sodium Hyaluronate Products</i>	86
Anti-infective Agents	86
Agents with Other Mechanisms	87
<i>Mitotech Russia: Vizomitin (SkQ1)</i>	87
Sustained-Release Rx Therapeutics	88
<i>Valeant Pharmaceuticals: Lacrisert</i>	88
Systemic Rx Therapeutics	88
<i>Daiichi Sankyo: Evoxac</i>	89
<i>Pilocarpine Agents: Salagen from Eisai and Others</i>	89
RX PHARMA DEVELOPMENT PIPELINE	90
Anti-inflammatories and Immunomodulators	90
<i>Allergan: Restasis X</i>	92
<i>Sun Pharma: Seciera</i>	92
<i>DH Bio/BTO Pharm: Haporine-S</i>	92
<i>Han Lim Pharmaceutical: Tisporin</i>	92
<i>Kala Pharmaceuticals: INVELTYS (KPI-121)</i>	93
<i>Kissei Pharmaceutical: KCT-0809</i>	93
<i>Novaliq: CyclASol</i>	93
<i>RegeneRx/G-treeBNT/ReGenTree: RGN-259</i>	94
HA Lubricating Rx Agents	95
<i>Seikagaku: SI-614</i>	95
Secretagogues and Other Mucin Enhancers	95
<i>Dong-A ST: DA-6034</i>	96
<i>Mimetogen Pharmaceuticals: Tavilemide (MIM-D3)</i>	96
Additional Therapeutic Candidates	98
<i>Parion Sciences: P-321</i>	98
<i>Sylentis: SYL-1001</i>	99
<i>Winston Pharmaceuticals' Civamide Nasal Solution</i>	99
<i>Dompé: rhNGF Eye Drops</i>	99
<i>KT&G Life Sciences: KL7016</i>	100
<i>Laboratoires Théa: T2762</i>	100
<i>Mitotech: Vizomitin (SkQ1)</i>	100
Targeting Sjögren's Syndrome	101
<i>Novartis: VAY736</i>	101
US Phase III Recap	102
Drug Delivery	103
<i>InSite Vision: DuraSite 2 and ISV-101</i>	103
<i>Novaliq: CyclASol</i>	104

<i>Ocular Therapeutix: OTX-DP</i>	104
Stalled or Abandoned Dry Eye Product Candidates.....	105
DRY EYE PROCEDURES	106
Punctum Plugs.....	106
<i>Punctum Plug Applications</i>	107
<i>Punctum Plug Manufacturers</i>	107
<i>Cost of Punctum Plugs</i>	111
<i>Punctum Plug Development</i>	111
Procedures and Devices for MGD	112
<i>J&J Vision (formerly TearScience) LipiFlow Procedure</i>	112
<i>MiBoMedical Group MiBoFlo ThermoFlo Procedure</i>	115
<i>Intense Pulsed Light (IPL)</i>	115
<i>Gulden Ophthalmics MG Expressor Kit</i>	116
<i>Laboratoires Théa Blephasteam</i>	116
<i>Rhein Medical's Maskin Meibomian Gland Intraductal Probe</i>	116
<i>RySurg's BlephEx</i>	116
Tissue Engineering and Regeneration	117
<i>Bio-Tissue's ProKera</i>	117
<i>Katena/IOP Ophthalmics' Dehydrated Amniotic Membrane</i>	117
Reservoir and Hydration-based Procedures and Devices.....	118
<i>Boston Foundation for Sight's PROSE Treatment</i>	118
<i>Blanchard Contact Lenses Onefit</i>	119
Alternative Technologies.....	119
<i>Allergan's TrueTear Nueronasal Stimulator</i>	119
Investigational Procedures and Devices.....	120
<i>Lacrimal Abdominal Reservoir</i>	120
<i>Tear Film Innovations: iLux</i>	120
OTC LUBRICATING PRODUCTS	121
<i>Lubricating Drops</i>	121
<i>Ointments and Gels</i>	121
Leading Artificial Tear Products.....	121
<i>Alcon (Novartis): Systane</i>	121
<i>Allergan: Refresh and Optive</i>	123
<i>J&J Vision: Blink Tears</i>	124
<i>Bausch + Lomb: Soothe and Advanced Eye Relief</i>	124
<i>Akorn's TheraTears</i>	125
<i>Oasis Medical's Oasis Tears</i>	125
<i>Johnson & Johnson's Visine</i>	125
Additional Artificial Tears Products	126
<i>Novaliq: NovaTears</i>	126
<i>OCuSOFT's Retaine</i>	126
<i>OCuSOFT: Tears Again</i>	127
<i>Paragon BioTeck: EqualEyes</i>	127
<i>Santen/Novagali: Cationorm</i>	127
<i>Similasan: Dry Eye Relief</i>	128

<i>Spectrum Thea: Thealoz</i>	128
<i>New Developments</i>	128
Composition and Classification	128
<i>Chemical Composition of Lubricating Tears and Gels</i>	128
<i>Preservative Use in Lubricating Tears and Gels</i>	129
<i>Classification by Packaging</i>	132
Hybrid OTC/Rx Lubricants	134
<i>TRB Chemedica's Vismed</i>	135
<i>Allergan's Optava</i>	136
GLOBAL DRY EYE MARKET FORECASTS	137
<i>Global Market for Dry Eye Products</i>	137
<i>Company Market Share</i>	140
The Rx Market Segment	141
<i>Forecast for the Rx Product Market Segment</i>	143
<i>Company Market Share in Rx Segment</i>	146
The Procedure Market Segment	147
<i>The Market in Newer Procedures</i>	149
<i>Forecast for the Punctum Plug Market Segment</i>	151
OTC Market Segment	153
<i>Forecast for the OTC Market Segment</i>	153
<i>Company Market Share in the OTC Segment</i>	157
OTHER DRY EYE PRODUCTS, PROCEDURES	158
OTC Nutritional Supplementation	158
<i>Studies</i>	158
<i>TRB Chemedica's Remogen Omega</i>	159
<i>ScienceBased Health's HydroEye SoftGels</i>	159
<i>BioSyntrx' BioTears Oral Gel Caps</i>	159
<i>Akorn's TheraTears Nutrition</i>	160
<i>Other Supplements</i>	160
Other Dry Eye Treatments	160
<i>Autologous Serum Eye Drops</i>	160
<i>Lateral Tarsorrhaphy</i>	160
<i>Moisture Shielding Eyewear</i>	161
COMPANY PROFILES	162
Company Share in the Dry Eye Market	162
Akorn, Inc.	163
Alcon, Inc.	164
Allergan plc	165
Bausch + Lomb	166
Beaver-Visitec International, Inc.	167
BioSyntrx, Inc.	168
Bio-Tissue, Inc.	169
Eagle Vision, Inc.	170
FCI Ophthalmics	171
Gulden Ophthalmics	172

Johnson & Johnson Vision.....	173
Kala Pharmaceuticals	174
Katena Products.....	175
Laboratoires Théa	176
Lacrimedics, Inc.	177
Medennium, Inc.....	178
Mimetogen Pharmaceuticals.....	179
Oasis Medical, Inc.....	180
OCuSOFT, Inc.	181
Ocular Therapeutix	182
Otsuka Pharmaceutical Co., Ltd.	183
Rhein Medical, Inc.	184
Santen Pharmaceutical Co., Ltd.	185
ScienceBased Health, Inc.....	186
Senju Pharmaceutical Co., Ltd.	187
Shire Plc.....	188
Similasan.....	189
Sun Pharmaceutical Industries, Inc.	190
Surgical Specialties Corporation.....	191
Tear Film Innovations	192
TearLab Corporation.....	193
TRB Chemedica International S.A.....	194
INDEX OF TABLES	195
INDEX OF FIGURES.....	196

INTRODUCTION

Market Scope's *2017 Dry Eye Products Report* analyzes the current marketplace and forecasts market performance over the next five years. The report is designed to provide value to members of the ophthalmic industry who participate in the dry eye products market, providers of dry eye treatment, market analysts, investors, and any other parties interested in dry eye treatments or related products.

Scope

We use eight categories defined by region and economics in our analysis: the United States, Western Europe, Japan, Other Wealthy Nations (OWN), China, India, Latin America, and Rest of World (ROW). Our OWN category is made up of a mix of nations with higher per-capita gross domestic products throughout the world—Canada, South Korea, and the United Arab Emirates are examples. The ROW category is a catch-all category for nations not included elsewhere. ROW nations have diverse economies and a significant range of development levels. Namibia, Indonesia, Turkey, and Russia are examples.

Our report is designed to provide depth and context to the reader's understanding of market dynamics in this ophthalmic segment. Our coverage includes:

- Overview of dry eye disease
- Diagnosis and treatment of dry eye
- A global view of dry eye care providers
- Current estimates and five-year forecasts for dry eye in our eight analytic categories
- Dry eye Rx products in the marketplace
- Devices and procedures used to treat dry eye
- OTC products for dry eye
- Investigational agents in the development pipeline
- Profiles of companies developing, making, and marketing dry eye products

Methodology

Data and forecasts in our report span 2016 through 2022. We use both primary and secondary sources for the data and information. These include:

- Market Scope surveys of ophthalmologists
- Market Scope's proprietary disease models
- Interviews with executives from companies in the market segment
- Interviews with product development teams
- Published medical research
- Research presentations at ophthalmic meetings

Copyright © 2017 Market Scope®

**No part of this document may be reproduced without
written permission from the publisher.**