

# Global Anti-counterfeit Packaging in Consumer Goods Market Report 2019, Competitive Landscape, Trends and Opportunities

https://marketpublishers.com/r/GF092AD22EFCEN.html

Date: June 2019 Pages: 109 Price: US\$ 2,950.00 (Single User License) ID: GF092AD22EFCEN

## Abstracts

The Anti-counterfeit Packaging in Consumer Goods market has witnessed growth from USD XX million to USD XX million from 2014 to 2019. With the CAGR of X.X%, this market is estimated to reach USD XX million in 2026.

The report mainly studies the size, recent trends and development status of the Anticounterfeit Packaging in Consumer Goods market, as well as investment opportunities, government policy, market dynamics (drivers, restraints, opportunities), supply chain and competitive landscape. Technological innovation and advancement will further optimize the performance of the product, making it more widely used in downstream applications. Moreover, Porter's Five Forces Analysis (potential entrants, suppliers, substitutes, buyers, industry competitors) provides crucial information for knowing the Anti-counterfeit Packaging in Consumer Goods market.

Major players in the global Anti-counterfeit Packaging in Consumer Goods market include: Applied DNA Sciences Illinois Tool Works Digimarc Zebra Technologies Corp 3M UPM Essentra PLC Impinj Avery Dennison Du Pont



On the basis of types, the Anti-counterfeit Packaging in Consumer Goods market is primarily split into: Coding & Printing Technology RFID Holographic Technology Security Label Packaging Design

On the basis of applications, the market covers: Food & beverage Pharmaceuticals & healthcare Industrial & automotive Consumer durables Clothing & apparel Others

Geographically, the report includes the research on production, consumption, revenue, market share and growth rate, and forecast (2014-2026) of the following regions: United States Europe (Germany, UK, France, Italy, Spain, Russia, Poland) China Japan India Southeast Asia (Malaysia, Singapore, Philippines, Indonesia, Thailand, Vietnam) Central and South America (Brazil, Mexico, Colombia) Middle East and Africa (Saudi Arabia, United Arab Emirates, Turkey, Egypt, South Africa, Nigeria) Other Regions

Chapter 1 provides an overview of Anti-counterfeit Packaging in Consumer Goods market, containing global revenue, global production, sales, and CAGR. The forecast and analysis of Anti-counterfeit Packaging in Consumer Goods market by type, application, and region are also presented in this chapter.

Chapter 2 is about the market landscape and major players. It provides competitive situation and market concentration status along with the basic information of these players.



Chapter 3 provides a full-scale analysis of major players in Anti-counterfeit Packaging in Consumer Goods industry. The basic information, as well as the profiles, applications and specifications of products market performance along with Business Overview are offered.

Chapter 4 gives a worldwide view of Anti-counterfeit Packaging in Consumer Goods market. It includes production, market share revenue, price, and the growth rate by type.

Chapter 5 focuses on the application of Anti-counterfeit Packaging in Consumer Goods, by analyzing the consumption and its growth rate of each application.

Chapter 6 is about production, consumption, export, and import of Anti-counterfeit Packaging in Consumer Goods in each region.

Chapter 7 pays attention to the production, revenue, price and gross margin of Anticounterfeit Packaging in Consumer Goods in markets of different regions. The analysis on production, revenue, price and gross margin of the global market is covered in this part.

Chapter 8 concentrates on manufacturing analysis, including key raw material analysis, cost structure analysis and process analysis, making up a comprehensive analysis of manufacturing cost.

Chapter 9 introduces the industrial chain of Anti-counterfeit Packaging in Consumer Goods. Industrial chain analysis, raw material sources and downstream buyers are analyzed in this chapter.

Chapter 10 provides clear insights into market dynamics.

Chapter 11 prospects the whole Anti-counterfeit Packaging in Consumer Goods market, including the global production and revenue forecast, regional forecast. It also foresees the Anti-counterfeit Packaging in Consumer Goods market by type and application.

Chapter 12 concludes the research findings and refines all the highlights of the study.

Chapter 13 introduces the research methodology and sources of research data for your understanding.



Years considered for this report: Historical Years: 2014-2018 Base Year: 2019 Estimated Year: 2019 Forecast Period: 2019-2026



# Contents

#### 1 ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS MARKET OVERVIEW

- 1.1 Product Overview and Scope of Anti-counterfeit Packaging in Consumer Goods
- 1.2 Anti-counterfeit Packaging in Consumer Goods Segment by Type
- 1.2.1 Global Anti-counterfeit Packaging in Consumer Goods Production and CAGR(%) Comparison by Type (2014-2026)
- 1.2.2 The Market Profile of Coding & Printing Technology
- 1.2.3 The Market Profile of RFID
- 1.2.4 The Market Profile of Holographic Technology
- 1.2.5 The Market Profile of Security Label
- 1.2.6 The Market Profile of Packaging Design
- 1.3 Global Anti-counterfeit Packaging in Consumer Goods Segment by Application
- 1.3.1 Anti-counterfeit Packaging in Consumer Goods Consumption (Sales)
- Comparison by Application (2014-2026)
  - 1.3.2 The Market Profile of Food & beverage
  - 1.3.3 The Market Profile of Pharmaceuticals & healthcare
  - 1.3.4 The Market Profile of Industrial & automotive
  - 1.3.5 The Market Profile of Consumer durables
  - 1.3.6 The Market Profile of Clothing & apparel
  - 1.3.7 The Market Profile of Others

1.4 Global Anti-counterfeit Packaging in Consumer Goods Market by Region (2014-2026)

1.4.1 Global Anti-counterfeit Packaging in Consumer Goods Market Size (Value) and CAGR (%) Comparison by Region (2014-2026)

1.4.2 United States Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3 Europe Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3.1 Germany Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3.2 UK Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3.3 France Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3.4 Italy Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3.5 Spain Anti-counterfeit Packaging in Consumer Goods Market Status and



Prospect (2014-2026)

1.4.3.6 Russia Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.3.7 Poland Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.4 China Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.5 Japan Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.6 India Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7 Southeast Asia Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7.1 Malaysia Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7.2 Singapore Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7.3 Philippines Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7.4 Indonesia Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7.5 Thailand Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.7.6 Vietnam Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.8 Central and South America Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.8.1 Brazil Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.8.2 Mexico Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.8.3 Colombia Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.9 Middle East and Africa Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.9.1 Saudi Arabia Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.9.2 United Arab Emirates Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)



1.4.9.3 Turkey Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.9.4 Egypt Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.9.5 South Africa Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.4.9.6 Nigeria Anti-counterfeit Packaging in Consumer Goods Market Status and Prospect (2014-2026)

1.5 Global Market Size (Value) of Anti-counterfeit Packaging in Consumer Goods (2014-2026)

1.5.1 Global Anti-counterfeit Packaging in Consumer Goods Revenue Status and Outlook (2014-2026)

1.5.2 Global Anti-counterfeit Packaging in Consumer Goods Production Status and Outlook (2014-2026)

### 2 GLOBAL ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS MARKET LANDSCAPE BY PLAYER

2.1 Global Anti-counterfeit Packaging in Consumer Goods Production and Share by Player (2014-2019)

2.2 Global Anti-counterfeit Packaging in Consumer Goods Revenue and Market Share by Player (2014-2019)

2.3 Global Anti-counterfeit Packaging in Consumer Goods Average Price by Player (2014-2019)

2.4 Anti-counterfeit Packaging in Consumer Goods Manufacturing Base Distribution, Sales Area and Product Type by Player

2.5 Anti-counterfeit Packaging in Consumer Goods Market Competitive Situation and Trends

2.5.1 Anti-counterfeit Packaging in Consumer Goods Market Concentration Rate

2.5.2 Anti-counterfeit Packaging in Consumer Goods Market Share of Top 3 and Top 6 Players

2.5.3 Mergers & Acquisitions, Expansion

#### **3 PLAYERS PROFILES**

3.1 Applied DNA Sciences

3.1.1 Applied DNA Sciences Basic Information, Manufacturing Base, Sales Area and Competitors

3.1.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and



Specification

3.1.3 Applied DNA Sciences Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.1.4 Applied DNA Sciences Business Overview

3.2 Illinois Tool Works

3.2.1 Illinois Tool Works Basic Information, Manufacturing Base, Sales Area and Competitors

3.2.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.2.3 Illinois Tool Works Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.2.4 Illinois Tool Works Business Overview

3.3 Digimarc

3.3.1 Digimarc Basic Information, Manufacturing Base, Sales Area and Competitors

3.3.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.3.3 Digimarc Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.3.4 Digimarc Business Overview

3.4 Zebra Technologies Corp

3.4.1 Zebra Technologies Corp Basic Information, Manufacturing Base, Sales Area and Competitors

3.4.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.4.3 Zebra Technologies Corp Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.4.4 Zebra Technologies Corp Business Overview

3.5 3M

3.5.1 3M Basic Information, Manufacturing Base, Sales Area and Competitors

3.5.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.5.3 3M Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.5.4 3M Business Overview

3.6 UPM

3.6.1 UPM Basic Information, Manufacturing Base, Sales Area and Competitors

3.6.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.6.3 UPM Anti-counterfeit Packaging in Consumer Goods Market Performance



(2014-2019)

3.6.4 UPM Business Overview

3.7 Essentra PLC

3.7.1 Essentra PLC Basic Information, Manufacturing Base, Sales Area and Competitors

3.7.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.7.3 Essentra PLC Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.7.4 Essentra PLC Business Overview

3.8 Impinj

3.8.1 Impinj Basic Information, Manufacturing Base, Sales Area and Competitors

3.8.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.8.3 Impinj Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.8.4 Impinj Business Overview

3.9 Avery Dennison

3.9.1 Avery Dennison Basic Information, Manufacturing Base, Sales Area and Competitors

3.9.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.9.3 Avery Dennison Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.9.4 Avery Dennison Business Overview

3.10 Du Pont

3.10.1 Du Pont Basic Information, Manufacturing Base, Sales Area and Competitors

3.10.2 Anti-counterfeit Packaging in Consumer Goods Product Profiles, Application and Specification

3.10.3 Du Pont Anti-counterfeit Packaging in Consumer Goods Market Performance (2014-2019)

3.10.4 Du Pont Business Overview

## 4 GLOBAL ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS PRODUCTION, REVENUE (VALUE), PRICE TREND BY TYPE

4.1 Global Anti-counterfeit Packaging in Consumer Goods Production and Market Share by Type (2014-2019)

4.2 Global Anti-counterfeit Packaging in Consumer Goods Revenue and Market Share



by Type (2014-2019)

4.3 Global Anti-counterfeit Packaging in Consumer Goods Price by Type (2014-2019)

4.4 Global Anti-counterfeit Packaging in Consumer Goods Production Growth Rate by Type (2014-2019)

4.4.1 Global Anti-counterfeit Packaging in Consumer Goods Production Growth Rate of Coding & Printing Technology (2014-2019)

4.4.2 Global Anti-counterfeit Packaging in Consumer Goods Production Growth Rate of RFID (2014-2019)

4.4.3 Global Anti-counterfeit Packaging in Consumer Goods Production Growth Rate of Holographic Technology (2014-2019)

4.4.4 Global Anti-counterfeit Packaging in Consumer Goods Production Growth Rate of Security Label (2014-2019)

4.4.5 Global Anti-counterfeit Packaging in Consumer Goods Production Growth Rate of Packaging Design (2014-2019)

## 5 GLOBAL ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS MARKET ANALYSIS BY APPLICATION

5.1 Global Anti-counterfeit Packaging in Consumer Goods Consumption and Market Share by Application (2014-2019)

5.2 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate by Application (2014-2019)

5.2.1 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate of Food & beverage (2014-2019)

5.2.2 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate of Pharmaceuticals & healthcare (2014-2019)

5.2.3 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate of Industrial & automotive (2014-2019)

5.2.4 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate of Consumer durables (2014-2019)

5.2.5 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate of Clothing & apparel (2014-2019)

5.2.6 Global Anti-counterfeit Packaging in Consumer Goods Consumption Growth Rate of Others (2014-2019)

## 6 GLOBAL ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS PRODUCTION, CONSUMPTION, EXPORT, IMPORT BY REGION (2014-2019)

6.1 Global Anti-counterfeit Packaging in Consumer Goods Consumption by Region



(2014-2019)

6.2 United States Anti-counterfeit Packaging in Consumer Goods Production,

Consumption, Export, Import (2014-2019)

6.3 Europe Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

6.4 China Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

6.5 Japan Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

6.6 India Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

6.7 Southeast Asia Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

6.8 Central and South America Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

6.9 Middle East and Africa Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export, Import (2014-2019)

## 7 GLOBAL ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS PRODUCTION, REVENUE (VALUE) BY REGION (2014-2019)

7.1 Global Anti-counterfeit Packaging in Consumer Goods Production and Market Share by Region (2014-2019)

7.2 Global Anti-counterfeit Packaging in Consumer Goods Revenue (Value) and Market Share by Region (2014-2019)

7.3 Global Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.4 United States Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.5 Europe Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.6 China Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.7 Japan Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.8 India Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.9 Southeast Asia Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)



7.10 Central and South America Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

7.11 Middle East and Africa Anti-counterfeit Packaging in Consumer Goods Production, Revenue, Price and Gross Margin (2014-2019)

### 8 ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS MANUFACTURING ANALYSIS

- 8.1 Anti-counterfeit Packaging in Consumer Goods Key Raw Materials Analysis
  - 8.1.1 Key Raw Materials Introduction
  - 8.1.2 Price Trend of Key Raw Materials
  - 8.1.3 Key Suppliers of Raw Materials
  - 8.1.4 Market Concentration Rate of Raw Materials
- 8.2 Manufacturing Cost Analysis
- 8.2.1 Labor Cost Analysis
- 8.2.2 Manufacturing Cost Structure Analysis
- 8.3 Manufacturing Process Analysis of Anti-counterfeit Packaging in Consumer Goods

#### 9 INDUSTRIAL CHAIN, SOURCING STRATEGY AND DOWNSTREAM BUYERS

9.1 Anti-counterfeit Packaging in Consumer Goods Industrial Chain Analysis

9.2 Raw Materials Sources of Anti-counterfeit Packaging in Consumer Goods Major Players in 2018

9.3 Downstream Buyers

#### **10 MARKET DYNAMICS**

10.1 Drivers

10.2 Restraints

10.3 Opportunities

10.3.1 Advances in Innovation and Technology for Anti-counterfeit Packaging in Consumer Goods

10.3.2 Increased Demand in Emerging Markets

- 10.4 Challenges
- 10.4.1 The Performance of Alternative Product Type is Getting Better and Better
- 10.4.2 Price Variance Caused by Fluctuations in Raw Material Prices
- 10.5 Porter?s Five Forces Analysis
  - 10.5.1 Threat of New Entrants
  - 10.5.2 Threat of Substitutes



- 10.5.3 Bargaining Power of Suppliers
- 10.5.4 Bargaining Power of Buyers
- 10.5.5 Intensity of Competitive Rivalry

#### 11 GLOBAL ANTI-COUNTERFEIT PACKAGING IN CONSUMER GOODS MARKET FORECAST (2019-2026)

11.1 Global Anti-counterfeit Packaging in Consumer Goods Production, Revenue Forecast (2019-2026)

11.1.1 Global Anti-counterfeit Packaging in Consumer Goods Production and Growth Rate Forecast (2019-2026)

11.1.2 Global Anti-counterfeit Packaging in Consumer Goods Revenue and Growth Rate Forecast (2019-2026)

11.1.3 Global Anti-counterfeit Packaging in Consumer Goods Price and Trend Forecast (2019-2026)

11.2 Global Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast by Region (2019-2026)

11.2.1 United States Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast (2019-2026)

11.2.2 Europe Anti-counterfeit Packaging in Consumer Goods Production,

Consumption, Export and Import Forecast (2019-2026)

11.2.3 China Anti-counterfeit Packaging in Consumer Goods Production,

Consumption, Export and Import Forecast (2019-2026)

11.2.4 Japan Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast (2019-2026)

11.2.5 India Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast (2019-2026)

11.2.6 Southeast Asia Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast (2019-2026)

11.2.7 Central and South America Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast (2019-2026)

11.2.8 Middle East and Africa Anti-counterfeit Packaging in Consumer Goods Production, Consumption, Export and Import Forecast (2019-2026)

11.3 Global Anti-counterfeit Packaging in Consumer Goods Production, Revenue and Price Forecast by Type (2019-2026)

11.4 Global Anti-counterfeit Packaging in Consumer Goods Consumption Forecast by Application (2019-2026)

#### 12 RESEARCH FINDINGS AND CONCLUSION



#### **13 APPENDIX**

- 13.1 Methodology
- 13.2 Research Data Source



#### I would like to order

Product name: Global Anti-counterfeit Packaging in Consumer Goods Market Report 2019, Competitive Landscape, Trends and Opportunities
Product link: <a href="https://marketpublishers.com/r/GF092AD22EFCEN.html">https://marketpublishers.com/r/GF092AD22EFCEN.html</a>
Price: US\$ 2,950.00 (Single User License / Electronic Delivery)
If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

#### Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <u>https://marketpublishers.com/r/GF092AD22EFCEN.html</u>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name: Last name: Email: Company: Address: City: Zip code: Country: Tel: Fax: Your message:

\*\*All fields are required

Custumer signature \_\_\_\_\_

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <u>https://marketpublishers.com/docs/terms.html</u>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970



Global Anti-counterfeit Packaging in Consumer Goods Market Report 2019, Competitive Landscape, Trends and Oppo...